PHYSICIANS' PERCEPTIONS OF THE HONG KONG CERVICAL SCREENING PROGRAMME: IMPLICATIONS FOR IMPROVING CERVICAL HEALTH

Cecilia Stover Fabrizio, MPH, MBA

A dissertation submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of the requirements for the degree of Doctor of Public Health in the Gillings School of Global Health.

Chapel Hill
2011

Approved by:

Christopher Shea, PhD, Chair

William Carpenter, PhD

Suzanne Havala Hobbs, DrPH

Sheila Twinn, PhD

Bryan Weiner, PhD

@2011
Cecilia Stover Fabrizio
ALL RIGHTS RESERVED

ABSTRACT

CECILIA FABRIZIO: Physicians' Perceptions of the Hong Kong Cervical Screening Programme: Implications for Improving Cervical Health
(Under the direction of Christopher Shea, PhD)

Background: The incidence and mortality rates of cervical cancer are disproportionately higher in Hong Kong than in developed countries with similar resources. In 2004 the Hong Kong government introduced the Cervical Screening Program (CSP) to increase the population screening coverage rates, and to reduce the incidence and mortality of cervical cancer. Seven years after the launch of the program, proximal outcomes are disappointing; registration among both physicians and women is below twenty percent of those eligible, and there have been negligible changes in rates of screening.

Objective: The purpose of this study was to inform policy considerations by exploring the under-participation of practitioners in the CSP.

Methods: Using both snowball and purposeful sampling, sixteen physician key informants were interviewed to explore the factors that might influence their decisions to participate in the program. Rogers' Diffusion of Innovations, and its focus on the individual's adoption-decision process, served as a theoretical framework for analysis. Data were coded, and then analyzed in matrix displays for themes and higher-level analysis. This analysis was conducted by key variables such as specialty, gender, or CSP registration status. As themes emerged, they were summarized into findings, illustrated by quotes.

Results: Several themes emerged to suggest the benefits and barriers that might influence CSP participation, including a lack of benefits that were meaningful to the physicians; administrative cost and complexity; and polices that were incompatible with physicians' usual care practices.

Recommendations: The data from this study indicate that the CSP's characteristics are limiting physicians' participation in the program. Importantly, the CSP does not influence rates of overscreening among those physicians who currently conduct cervical screening, nor does the CSP overcome the obstacles to screening among physicians who do not do much screening. A Plan for Change is presented that uses the study findings and the lack of program outcomes to inform and influence cervical screening policy makers. Strategic recommendations suggest refocusing cervical screening policies and strengthening efforts to increase the uptake among underscreened women. The plan recommends the use of specific advocacy leadership skills to build support and influence, while working toward an opportune policy window for change.

ACKNOWLEDGEMENTS

I would like to acknowledge my friends and extended family for their support. My gratitude is strongest for my girls, Jessy and Emily, who suffered my academic preoccupation the most tangibly, and my husband, Ron, who still pretends that he will be able to retire on my new public health degree. I could not have persisted through this journey without my mother, who is my constant inspiration and unflagging support. I would also like to thank my committee members, William Carpenter, Susan Havela Hobbs, Sheila Twinn and Bryan Weiner, as each contributed indispensable expertise and succor. I am eternally grateful to my chair, Chris Shea, whose willingness to accommodate my "other-side-of-world" time difference was only exceeded by his knowledge and helpfulness; Chris was the most responsible for guiding me through this ambitious program. Finally, I wish to thank my cohort of fellow DrPH students, whose friendship and support, however virtual, reached out across the miles as we came through this journey together.

TABLE OF CONTENTS

LIST OF TABLES vi

LIST OF FIGURES.....vii

Chapter

1. INTRODUCTION 1

Statement of the issue…..……..……..... 1

Study aims…….……..... 3

Cervical cancer background 3

Hong Kong background…….....……...4

2: REVIEW OF THE LITERATURE 16

Search methodology 16

Search results…..... 18

Discussion……..…….……...…….…..……..30

Theoretical model.....31

Implications for research…….....…..……..…….34

3: METHODS 35

Study design 35

Participant selection…….……..……37

Data analysis 43

Limitations……..…….……..……...…..46

4: RESULTS.....49

Finding 1: CSP benefits were rarely salient 50

Finding 2: CSP administration was costly and complex.....54

Finding 3: CSP was incompatible with women's KAPs and typical care practice…….57

Finding 4: Communication channels.....66

Finding 5: Physicians have a rapid adoption-decision process…….....68

Conclusion. 71

5: THE PLAN FOR CHANGE…..….....75

Introduction..……..……..……75

Policy alternatives…….…….....…….……79

Advocacy plan…….……...…….……88

Conclusion……..…….……..……..…..108

6: DISCUSSION 110

Implications for future study…..……...……..…….……114

Final word….……..…….……..……114

APPENDIX A: Key Definitions….…….…….....….……116

APPENDIX B: Physician Discussion Guide 119

APPENDIX C: Cervical Cancer Program Description…..…122

APPENDIX D: Coding Guide..…..…… 123

APPENDIX E: Summary of Key Findings, by Registered versus Non-Registered Physicians…….126

REFERENCES 127

LIST OF TABLES

Table

1. Protective effect of screening after a negative smear, ages 35-64…….....22

2. Key informant characteristics……..…..……..…….……42

3. Research key findings summary…….....…….…….……..50

4. Implications of key findings…….....……..…..……..…78

5. Recommended policy components.....…..…….……..81

LIST OF FIGURES

Figure

Figure 1: Age-standardized incidence rates……..…….…..……2

Figure 2: Age-standardized mortality rates…….....……..……..2

Figure 3: Hong Kong incidence, mortality rates, 1989-2009……...….……...…..6

Figure 4: Average age-specific incidence and mortality rates of malignant neoplasm of cervix uteri in Hong Kong, 2004-2009…… …...…7

Figure 5: Hong Kong, age-specific incidence of HPV infection……...…….8

Figure 6: Hong Kong, age-specific incidence of cervical neoplasia.….....……..8

Figure 7: Hong Kong: age-specific incidence of invasive cervical cancer.....…9

Figure 8: Power Map Step 1: Identification of roles…..…….…..…..……..94

Figure 9: Power Map Step 2: Choosing targets……..……....……...…….96

Figure 10: Power Map Step 3: Evaluating targets……...…….……97

Figure 11: Advocacy Timetable…….……..……..……..……101

CHAPTER 1

INTRODUCTION

I. Statement of the Issue

Cervical cancer is the second most common female cancer worldwide after breast cancer, with estimates of over 500,000 new cases and more than 288,000 deaths per year (International Agency for Research on Cancer, 2005). Cervical cancer is unique among cancers in that its cause is known, it can be identified early and it can be treated effectively at a pre-cancerous stage. The most common screening test, the Papanicolaou smear (Pap test) is relatively inexpensive, widely available, and reasonably acceptable to women. As a result of the Pap test, government-organized screening programs in many developed countries, and opportunistic screening in many other countries, the global burden of cervical cancer has fallen in the last forty years.

Hong Kong women suffer from a disproportionately higher incidence of preventable morbidity and mortality from cervical cancer than women in similarly industrialized countries, as shown in Figures 1 & 2. These relatively higher rates are attributed to low rates of screening among women overall, and in particular, low screening rates among older and low-income women.

Figure 1: Age-standardized Cervical Cancer Incidence Rates

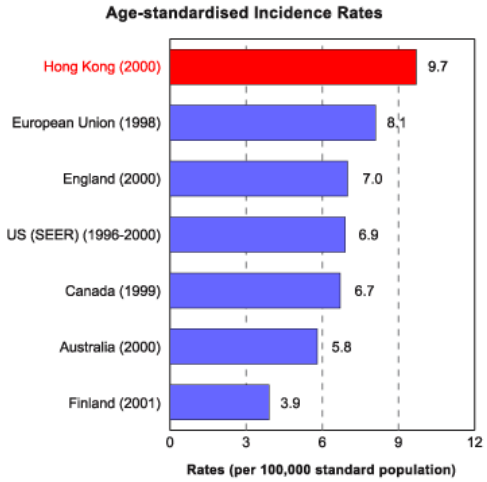
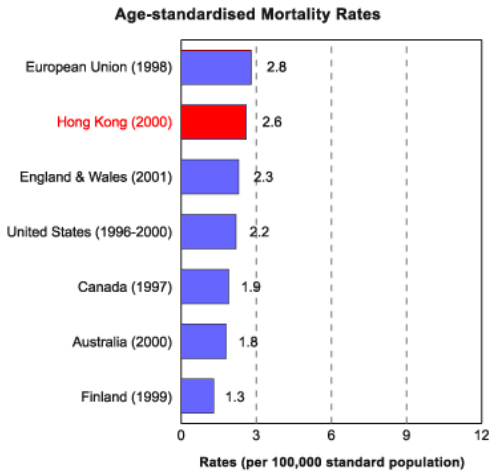


Figure 2: Age-standardized Cervical Cancer Mortality Rates



(Hong Kong Department of Health, 2009)

In 2004 the Hong Kong government introduced the Cervical Screening Program (CSP) with the objectives of increasing the population screening coverage rates and reducing the incidence and mortality of cervical cancer. Parallel strategies targeted: a) physicians to motivate them to increase the uptake of their patients; and b) women to take up regular screening. Both physicians and women were invited to register with the CSP and thus voluntarily build up a registry of data. Other countries do not have this type of voluntary system so it is difficult to compare results, however publicly available data show that proximal outcomes are disappointing. Registration among both physicians and women is below twenty percent of those eligible and there have been negligible changes in rates of screening.

II. Study Aims

Given Hong Kong women's disproportionate rates of cervical cancer and low participation in the CSP, this research aimed to understand the CSP's role in impacting cervical screening rates. Cervical screening rates can be influenced either directly, by attempting to change the behavior of the women, or indirectly, by working with physicians to recommend screening to their patients. The determinants of cervical cancer screening have been studied in Hong Kong, however not much is known about factors that impact physician's recommendations for cervical screening. Therefore, this study focused on the efforts of the CSP to motivate physicians to increase screening among their patients.

The purpose of this study was to explore the under-participation of private practitioners in the Hong Kong Cervical Cancer Screening Program by studying which factors influenced their adoption of the program. The results of the study will inform policy considerations for potential policy improvements to the national CSP.

III. Cervical Cancer Background

Screening methods and diagnosis

Cervical cancer's long, pre-invasive phase, which may extend as long as 10-15 years, makes it an ideal target for a screening program. Mild dysplasia, or the presence of abnormal cells, is commonly detected with cytology; a process that collects exfoliated cells from the cervix, stains them,and examines them under a microscope. Known as the "Pap test," it was first developed by Papanicolaou and Babes in the 1920's although it was not widely used in Western countries until the

60's and 70's (Papanicolaou, 1928; Papanicolaou & Traut, 1941, as reported in International Agency for Research on Cancer, 2005).

When Pap cytology is used as part of a broad-based screening program for cervical cancer, results are compelling. Early descriptive studies comparing the incidence of cervical cancer in Finland and Sweden before and after the introduction of opportunistic screening, reported declines in incidence of 50% and 34%, respectively (Laara, Day, & Hakama, 1987). Subsequent successful studies were designed as case-control or cohort follow-up studies (Clarke & Anderson, 1979; Hakama, Chamberlain, Day, Miller & Prorok, 1985). Today, although results have never been established through rigorous scientific trials, scientific agreement on the Pap test's effectiveness from these quasi-experimental studies has made it virtually impossible to conduct a randomized controlled trial, as it would be considered unethical to withhold screening from women in the control group (International Agency for Research on Cancer, 2005).

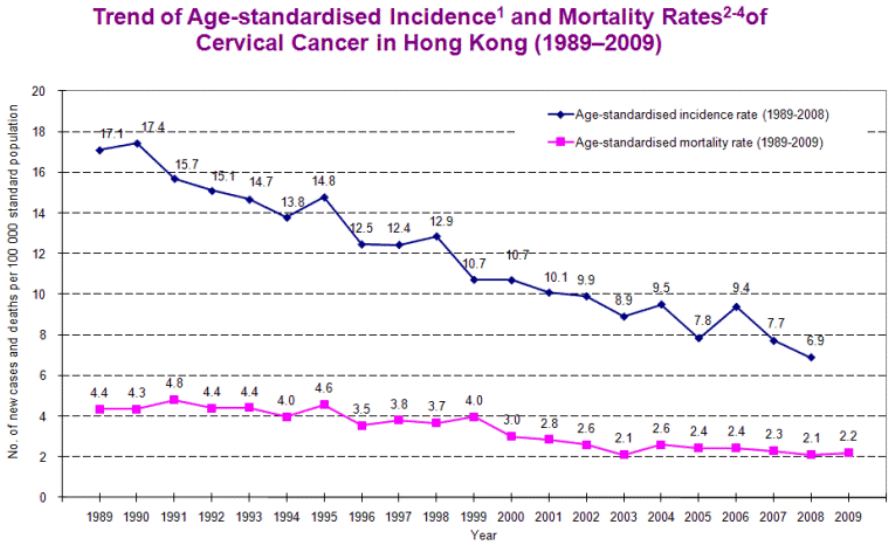
IV. Hong Kong Background

Hong Kong burden of cervical cancer

Cervical cancer was the ninth most common cause of female deaths in 2008, although the rate varies year to year and ranked as high as fifth in 2006. In 2008 there were 358 new cases, accounting for 3.1% of all new cancer cases in females. The median age at diagnosis was 53 years, with an age-standardized incidence rate of 6.9%. There were 120 deaths in 2008, with an age-standardized mortality rate of 2.1% (Hospital Authority, 2011).

Incidence of cervical cancer has fallen during the recent 30-year period. The Hong Kong Cancer Registry reports an overall age-adjusted cervical cancer rate of 24.9 per 100,000 in the 1972-74 period, reduced to 9.5 per 100,000 in the 1999-2001 period, for an average annual incidence reduction of 4.0%. Figure 3 shows incidence and mortality rates from 1989-2009. This reduction was most pronounced for women aged 30-65, although all ages showed some declines (Leung, et al., 2006). This reduction parallels the introduction of the Pap test, followed by increasing rates of opportunistic screening over time, and the systematic introduction of routine cytology as part of government-provided antenatal care in the 1980's. However this reduction in age-standardized incidence rates of about 50% from the 1980s is below that of developed countries where screening programs have been well organized. For example, Finland's age-standardized incidence and mortality fell by 80% from 1963-1990, and British Columbia, Canada's fell 70-80% from 1955-1985 (Day, Williams, Khaw, 1989). More recently, Britain's organized screening program, launched in the late 1980's, generated reductions in incidence of 40% and mortality of almost 50% between 1988 and 1995 (Cancer Research UK, 2003).

Figure 3: Hong Kong Incidence and mortality rates of cervical cancer, 1989-2009

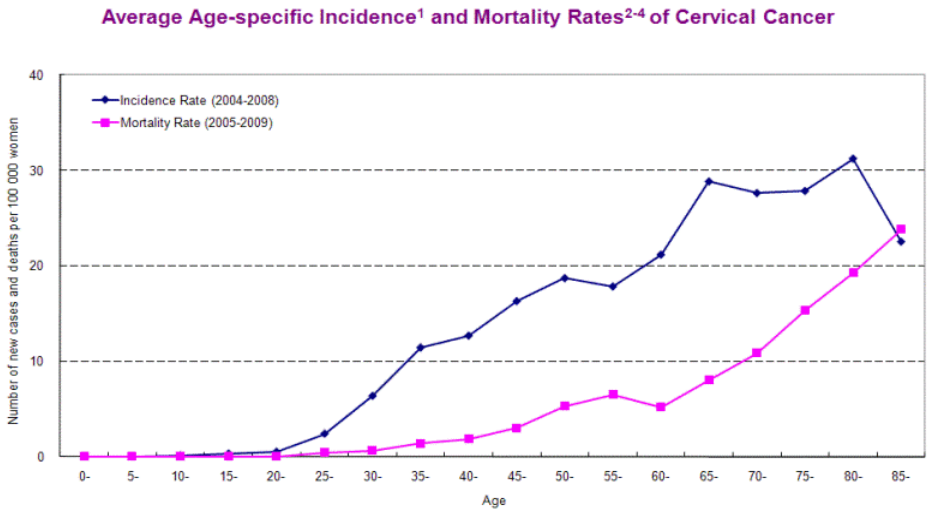


(Hong Kong Hospital Authority, 2010)

Similar to global data, the burden of cervical cancer in Hong Kong generally grows with increasing age, due to the long pre-invasive stage, post HPV infection (Figure 4). Incidence and mortality are quite low before 25 years of age, and then rise sharply. There is a peak in incidence for women in their 40s and 50s; however the highest incidence peak is among women aged 70–75 years.

While Hong Kong's incidence profile for women through their 50's is consistent with most American, Asian and African registries, Hong Kong's incidence differs from global data for women in their 70's. Those countries show continued declines in rates of invasive cancer while Hong Kong experiences a second peak (Gustafson et al., 1997). Mortality rates rise from the age group 35-39 years to their highest levels for women in the age group 80-84 years.

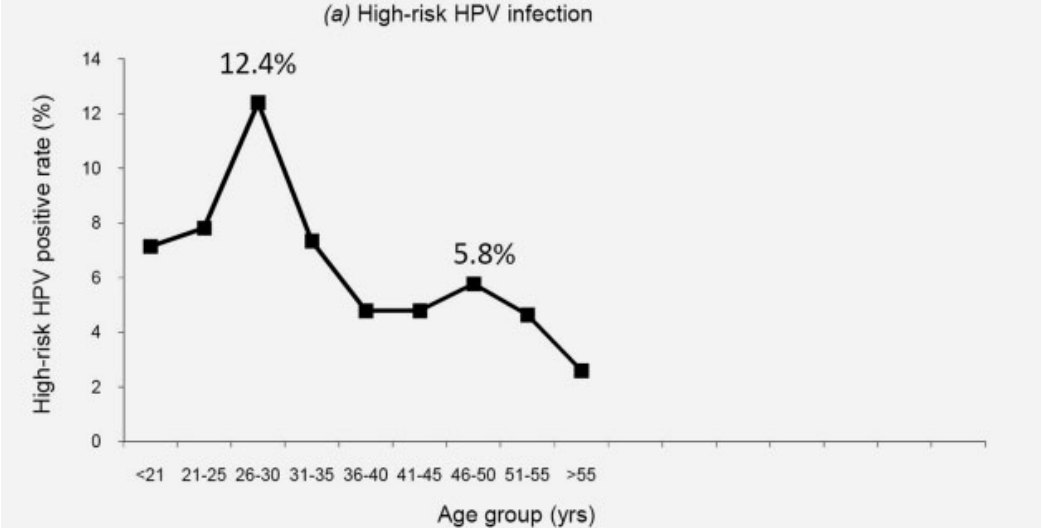
Figure 4: Average age-specific incidence (2004-2008) and mortality (2005-2009) rates of malignant neoplasm of cervix uteri in Hong Kong,



(Hong Kong Hospital Authority, 2010)

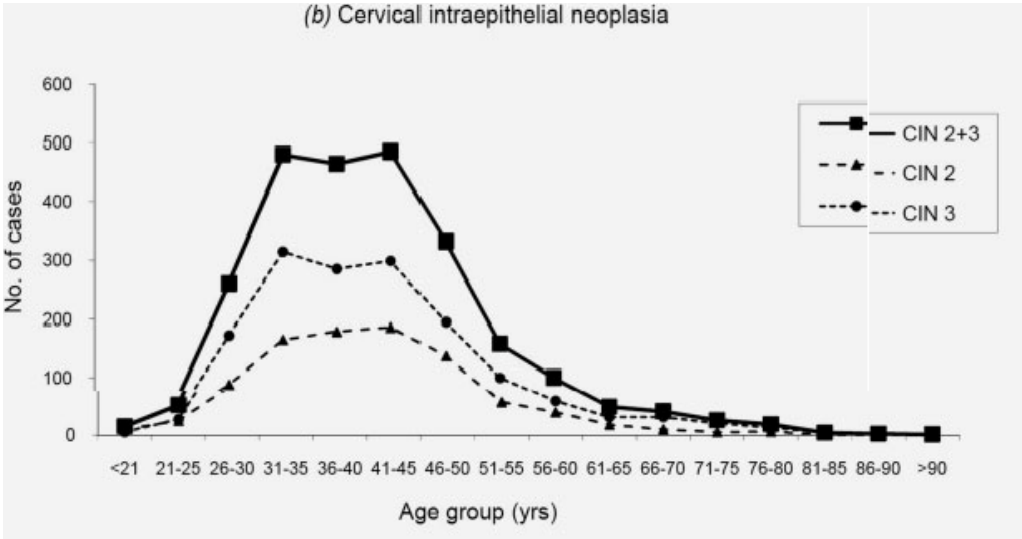
An analysis of HPV infection prevalence compared to age-specific cervical cancer incidence helps explain this troubling trend. Similar to global data, age-specific HPV prevalence in Hong Kong shows two peaks, at 26-30 years and at 46-50 years, similar to bimodal trends in many countries (Figure 5). The first peak is followed by cervical intraepithelial neoplasia lesions (CIN2/3) and invasive cervical cancers (ICC) at 5-15 years and 15 years later, respectively. However, while the second HPV peak is followed by ICC, it is not followed by a reported increase in CIN2/3 (Figures 6 & 7). This likely indicates that this older cohort of women may not have been screened (Chan, et al., 2010).

Figure 5: Hong Kong age-specific incidence of HPV infection



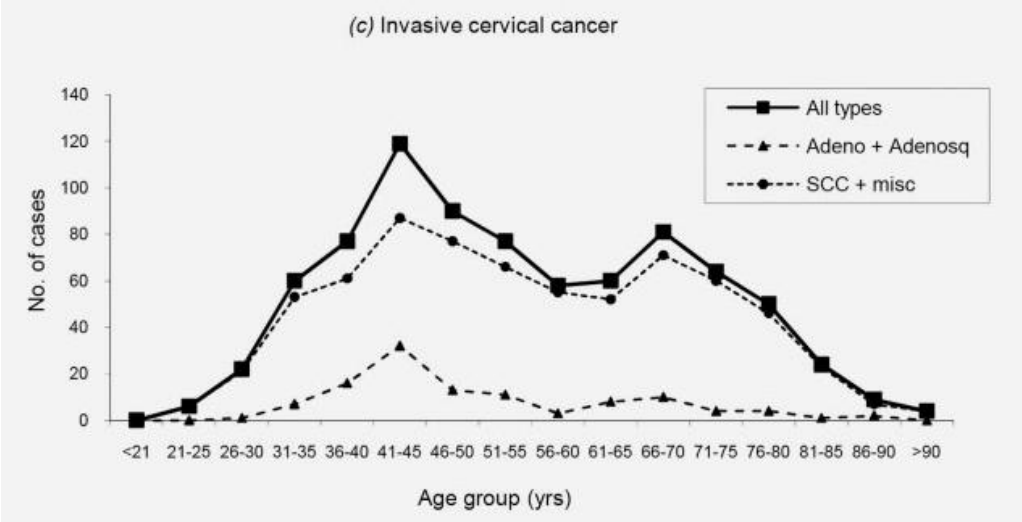
(Chan, et al., 2010)

Figure 6: Hong Kong age-specific incidence of cervical intraepithelial neoplasia



(Chan, et al., 2010)

Figure 7: Hong Kong age-specific incidence of invasive cervical cancer



(Chan, et al., 2010)

Hong Kong Primary Care Services Background

Hong Kong has a public-private health care system. Per a 2007 report by the Bauhinia Foundation, the majority of outpatient primary care visits (about 85%) were attributed to private medical or alternative medical practitioners, of which there are about 12,000. The government provides the remaining 15% of outpatient consultations and the majority of secondary or tertiary care. Despite an average of almost eight primary care visits a year, many women do not have a regular doctor, which limits continuity and comprehensiveness of care (Li, 2003). In fact "doctor-shopping," that is the changing of doctors without professional referral even in a single illness episode, is common (Leung, CastanCameo, McGhee, Wong, & Johnston, 2003).

Cervical screening in Hong Kong

Prior to the introduction of the CSP in 2004, cervical screening was done opportunistically or as part of general or well-women health checks offered by primary care providers. Galbraith (2005) estimated that about 60% of screening was conducted through non-governmental organizations, such as the Family Planning Association, and governmental agencies, including the Department of Health's Maternal and Child Health Centres, Women Health Centres, and Elderly Health Clinics, as well as the government hospital system. The remaining 40% was conducted in the private sector, which included single or group-based practitioners, and Well Women Clinics of private hospitals. In the private sector relatively few physicians may be responsible for the majority of private screening as it was estimated that only 40% of male generalists offered cervical screening to their patients, although data were limited and somewhat dated (Dickinson & Chan, 2001). All but the most low-income women pay for their screens, even in the public sector, although the lower screening fees in the government clinics are an indirect subsidy (HK$100 in government clinics versus HK$200-$500 in the private sector, or about US$13 versus US$25-$65).

In 1998, Adab, et al., (2004) estimated that the effectiveness of the territory's opportunistic screens in 1998 was equivalent to an organized program with about 50% coverage and 10-year screening intervals. However this screening was inefficient and inequitable, with poor coverage of those at risk and over-screening of a minority of women (Adab, McGhee, Yanova, Wong & Hedley, 2004). Vaidya, et

al. (1999), described Hong Kong's system as one that is "inequitable, wastes resources, and results in avoidable cases of cervical cancer."

The Hong Kong government tracks cervical screening with an annual telephone-based study, the Behavioral Risk Factor Survey (BRFS). This study is weighted by gender and age to make it more representative of the population. The BRFS reported a rate of 63.9% ever-screened women in the summer of 2004, the year the Cervical Screening Program began (Hong Kong Department of Health, 2010).

The Cervical Screening Program

The Cervical Screening Program (CSP) was introduced with the objective of:

- Increasing the population coverage rates of cervical screening among women
- Reducing the incidence of cervical cancer
- Reducing the mortality of cervical cancer

The program was positioned as benefiting overall screening coverage, equitable and efficient screening, better support and collaboration between the public and private sector, and better quality management in the screening service itself, from smear-taking to cytological examination, and with referrals and management of follow-up (Hong Kong Department of Health Topical Health #4: Prevention and Screening of Cervical Cancer, 2003).

CSP Policy Components

The screening policy addressed the target group and screening intervals. The target population was women between 25 to 65 years, with an interim target coverage

rate of 60% within three years after the program's launch, growing to 80-85% coverage over a longer period. Based on Hong Kong epidemiology, local practice guidelines, and experience from overseas, the CSP recommended two initial consecutive screens, and if there were no abnormal results, follow-up screens every three years. The CSP worked with the local medical societies in developing these guidelines and encouraged the societies to issue them to their medical constituencies.

Cervical Screening Information System (CSIS)

The CSIS was established by the Department of Health (DOH) for the following purposes:

- As a central recall registry
- To maintain information on screening history and results
- To track utilization of screening service and follow-up results
- To facilitate record linkage across service providers
- To link cervical smear data to biopsy results for correlation of cytology and biopsy
- To support quality assurance, evaluation, monitoring and research

Both physicians and women were invited to register, individually. Providers were asked to register themselves with the CSIS, and then to encourage their patients to register for the CSP and to be screened. As an incentive, physicians who registered were offered information kits on smear taking, educational materials for their clients and training courses (Surveillance and Epidemiology Branch, Centre for Health

Protection, 2004). The program also offered a recall system for their patients, and access to their screening history through a secure online system.

Women were invited to register with the program, either through their doctor, online, or by mailing in a form. They were required to consent to transfer their personal data and test results to the CSIS. Registered providers could also submit the registered women's details into the database. Women were required to use a password to access their screening history. The database then issued an automatic recall for the patient at the appropriate interval. The CSIS also promised to archive test results, email providers with details of patients recalled, and alert them of abnormal smears.

CSP Quality Management

The CSP sets criteria and guidelines for quality assurance and program delivery so that the program performance could be monitored for reliability and consistency. The CSP made specific technical recommendations for smear-taking, reporting and management of abnormal smears, and stipulated that all registered medical providers were allowed to take smears, including adequately trained and supervised nurses. CSP recommendations also included efforts to overcome barriers to screening, such as by encouraging professional education on communication with women. The quality assurance standards included reduced time to inform women of test results and a guideline for women to be informed of all test results, positive or negative.

CSP Recruitment and education

The program sought to collaborate with physicians and other service providers to encourage screening by providing data on screening, sending their patients reminder letters, setting up an enquiry system for cervical smear and biopsy results, and developing an informational website. For women, a recruitment and education strategy was formulated to recruit the target population into the program. Communication aimed to ensure that women understand the reasons for cervical screening, the test and procedures involved, the results, and the treatment options. Mass media levels were significant at the program's launch, followed by low, maintenance levels of promotion.

The CSP was not able to utilize national population listings for a "record and recall" system, due to local privacy constraints. Therefore,the program has no capability of targeting high-risk women if they do not register. Once a woman registers with the program and submits her Pap test results, the CSIS acts as a prospective recall system and sends her a reminder at the appropriate interval.

The program was conceived as a public-private partnership, meaning that the government would determine the program guidelines but the private sector would provide the service. The government consulted with stakeholders in the private sector in developing the framework of the program, and did not impose many regulations in its execution.

Importantly the market sets prices for services, and no subsidy is provided to women to access care, nor to providers to increase participation. Women can be

tested at their choice of a public or private health care provider, on a fee-for-service basis. Screening frequency is not monitored.

Building on an understanding of Hong Kong's disproportionate burden of cancer, and the description of the Hong Kong Cervical Screening Program, the next section introduces the literature on cervical cancer screening programs, determinants of screening, and interventions to increase rates of screening, for application to the development of this study.

CHAPTER 2

REVIEW OF THE LITERATURE

Hong Kong's CSP was intended to be a comprehensive program to increase the rates of cervical screening and decrease the incidence and mortality from cervical cancer. Therefore, a literature review was conducted to summarize the evidence for, and critical components of, cervical screening programs. This included both the evidence for screening programs in general and for cervical cancer screening programs in particular. In addition, the literature was searched for evidence on the determinants of screening and for interventions targeted to either women or physicians that increase women's participation in cervical screening.

I. Search Methodology

The computerized platform EBSCO was used to search the following individual online search engines, using their available cutoff publication dates as noted: Academic Search Premier (1975), PsychInfo (1975), Communication and Mass Media Complete (1915) and Health Source (1990). PubMed was searched separately.

The development of key terms was iterative. The first approach was quite broad, using the words "cervical," "cancer" and "screening" and/or "policy." These

results were then narrowed down by searching for a combination of these words, as noted below:

Policy:
For "policy," "program," and "regulation" were also used, but "policy" was the most fruitful search term.

Program Evaluation:
For "program evaluation," "implementation," "analysis," and "evidence-based" were also used.

Organized screening programs:
"Organized screening programs" and "cancer screening" were searched separately, as well as "cervical cancer" and "Hong Kong."

Determinants of screening
Psychosocial information was searched with the terms "psychosocial," "determinants," "barriers," and "acceptability."

Organized screening programs or Cancer Screening or Cervical Cancer or Hong Kong	and / or	Policy or Program or Regulation	and / or	Program Evaluation or Implementation or Analysis or Evidence-based	and / or	Determinants or Psychosocial or Barriers or Acceptability

The references identified by the searches underwent an initial stage of assessment for relevance. Then reference sections of studies from the search were examined for relevant articles. These articles were identified and examined. In addition, both the World Health Organization's International Agency for Research on Cancer's (IARC) handbook on Cervical Cancer Screening (2005), and the Hong

Kong DOH report on cervical screening (2003) offered comprehensive literature reviews for further research. Only studies published in English were included.

Articles excluded were studies or papers that only focused on primary prevention, such as the HPV vaccine, and those not relevant to cancer screening policy and practices in Hong Kong, such as alternate screening methods in low resource countries.

II. Search Results

The evidence on cervical cancer screening is grouped into three main discussion areas: 1) evidence for the effectiveness, efficiency and equity of organized screening programs; 2) determinants of cervical cancer screening and; 3) interventions for women or physicians to increase participation in cervical screening. Where there is Hong Kong-specific evidence it is discussed in the appropriate section.

Evidence for the effectiveness, efficiency and equity of organized screening programs

Components of an organized screening program

In 1993 the International Union against Cancer (UICC) summarized the components that successful programs shared in common, emphasizing the systematic roles of policy, active recruitment, quality assurance, evaluation, and monitoring:

- The larger target population is identifiable
- Individuals within the target population are identifiable

- Evidence-based recruitment methods are utilized to "guarantee" high coverage and attendance
- Programs have adequate facilities for collecting and analysis of the screened materials
- Programs have an organized quality control program for both screening and analysis of the screened materials
- After screening there are adequate facilities and capacity to diagnose and treat the person with the confirmed disease
- A referral system links the person screened, the laboratory, and the clinical provider for diagnosis and management of abnormal test results and for information about normal test results
- At the population level, evaluation and monitoring distinguishes between those screened and those not screened (Hakama, 1993)

Comparison of organized programs versus opportunistic programs

Organized programs have been evaluated versus opportunistic programs on the basis of their impact on cancer incidence and mortality, their potential to reduce disparities, their cost effectiveness, and their effect on risk reduction for a population versus an individual. Miles, et al. (2004), detailed how organized cancer screening programs had more potential to reduce the incidence and mortality of cancer than opportunistic programs. This was due to their ability to achieve higher levels of population coverage for diagnosis (including facilitation of identification of underserved groups), their use of a centralized registry, and their inclusion of

mechanisms for follow-up and quality assurance. When an organized program followed up on abnormal results, such as highlighted in the UICC description, it had the potential to increase the rates of diagnosis and treatment, and thereby reduce the rates of incidence and mortality (Miles, et al., 2004). Conversely, opportunistic screening could be characterized by over-screening of some women, often performed by more expensive providers such as gynecologists, with low coverage of women of older age and/or low socioeconomic background. In addition, test and reporting quality might not be consistent since it was not monitored systematically (Arbyn, et al, 2009).

Although there was no evidence that either an organized or opportunistic screening model entirely eliminated disparities, organized programs helped promote equality of access (Miles, et al., 2004). Importantly, access did not necessarily translate to equitable coverage, as this coverage was a function of the quality of the lists used to invite participants, the performance of the system issuing the invitation, and the relative participation levels of the target population. Opportunistic screening might miss those at highest risk because it does not reach out to all women in the target population and address barriers to access. Any particular woman's likelihood of being screened was influenced mainly by individual-level factors such as her physician, or her own knowledge, behavior, and access to care (Miles et al., 2004).

Organized programs achieved a stronger level of cost-effectiveness than opportunistic programs by focusing on coverage of the target group at appropriate intervals. Attendance rates were the major determinant of a program's health impact as well as its cost-effectiveness. Therefore, for a given number of screens conducted,

the maximum impact in life-years gained came from reducing the over-screening of low-risk women and increasing the under-screening of high-risk women (Koopmanschap, 1990). For example, in 1995 Norway established a national centralized system with obligatory registration of all cervical screening tests. Three-year coverage in the target group rose 7%, with increased participation of older and high-risk women; the number of smears fell 7%; and incidence declined 22% (Koopmanschap, van Oortmarssen, van Agt, van Ballegooijen, Habbema & Lubbe, 2006).

While opportunistic screening had few restrictions on quality, type and breadth of screening, for an individual woman it might offer a higher level of protection than an organized program because she might have more frequent screens, over a longer period of time, than that recommended in an organized program. However this opportunistic benefit had to be balanced with the greater potential for harm, as the disadvantages of cervical cancer screening were both physical and psychosocial. Physical outcomes included complications, potentially unnecessary medical interventions, overtreatment, treatment costs, or delayed diagnosis from false negative test results; psychosocial outcomes include stigmatization, anxiety over false positives, and overtreatment for non-progressive abnormalities (International Agency for Research on Cancer, 2005).

On the other hand, organized screening aimed for a population-level benefit that balanced benefits and harms, although in order to be cost-effective on a population basis this type of program might not offer an individual a screening test at a frequency that optimized her risk reduction (Anttila, et al., 2004; Miles, et al.,

2004). As shown in the chart below, epidemiological studies of effectiveness have enabled estimations of the impact of different screening intervals. After the first screen, a second screen was usually recommended one year later to offset a potential false negative result. After these two screens, reducing subsequent screens from one to three years only reduced the cumulative incidence of invasive cancer from 93% to 91%. This risk reduction might be acceptable on a population basis, but might not be ideal for a particular individual (Hakama, 1993; Goldie et al., 2005).

Table 1: Protective effect of screening after a negative smear, ages 35-64

Protective Effect of Screening After a Negative Smear	
Interval between screening (years)	Reduction in cumulative Incidence of invasive cervical cancer (%)
1	93.5
2	92.5
3	90.8
5	83.6
10	64.1

Organized cervical screening programs have been shown to be effective and have been recommended by the World Health Organization (World Health Organization, 2010).

Summary – Evidence for the effectiveness, efficiency and equity of organized screening programs

The evidence indicated that the most effective, efficient and equitable cervical screening programs: targeted at-risk women; maximized participation of those women; utilized a strong quality assurance program; and used financial incentives to

limit opportunistic screening and thereby reduce overscreening. Screening programs were typically classified as either organized, with a centralized invitation system at the population level, or opportunistic with screening initiated at the individual level.

Organized cervical screening programs were the most likely to outperform opportunistic programs for equity, participation and cost effectiveness, while opportunistic programs were more likely to over-screen younger, affluent, lower-risk women and under-screen older, less affluent and higher-risk women. Both types of programs could decrease incidence and mortality at the population level, while opportunistic programs might offer the most effective level of protection to the individual. However, due to cytology's weaknesses as a screening tool, which could induce both physical harm from overtreatment, complications or delayed diagnosis, and psychosocial problems, such as anxiety and stigma, organized programs offered the most benefit and least harm at the population level.

Determinants of cervical screening

Global evidence

In a 2005 IARC review of quantitative studies, most evidence of determinants of screening uptake was at the individual level. There were numerous studies of the barriers to screening that were relatively consistent among women in different countries, such as studies that identified women's attendance for screening to be most negatively affected by her age, her lack of knowledge about the need for screening, her socio-economic position, and her marital status (Vellozzi, Romans & Rothenberg, 1996; Eaker, et al., 2001; Blomberg, Ternestedt, Tomberg & Tishelman, 2008;

Paskett et al., 2009). In particular, women aged 65 or older were more likely to report that their doctor did not order or recommend the screen, or that they did not know they needed a screen (Hewitt, Devesa & Breen, 2004; Waller, Bartoszek, Marlow & Wardle, 2009). Studies also identified such psychosocial barriers as the women's perception of vulnerability, anxiety and fear of the cancer, her beliefs about the relevance of the test to her, and the priority she gave to screening (International Agency for Research on Cancer, 2005).

Hong Kong evidence

Several studies of Hong Kong women indicated that a similar range of factors contributed to the relatively high cervical cancer burden in Hong Kong. In addition to similar demographic and socioeconomic factors, many women did not perceive the need for screening, did not know that the Pap test can prevent cervical cancer, and felt that the absence of symptoms negated the need for a check-up (Adab, 1999; Adab, McGhee, Yanova, Chin, Wong & Hedley, 2000; Chang & Hazlett, 2002; Twinn, Holroyd, Fabrizio, Moore & Dickinson, 2005; Leung, 2010)

Cultural factors were also barriers to screening. Both cervical cancer in general, and HPV in particular, might violate cultural norms as they are associated with promiscuity and early onset of sexual activity (Kwan, et al., 2009). Women cited concerns about modesty and embarrassment as barriers to screening, and other women saw cancer as fate, without much that one could do to prevent it (Holroyd, 2004; Twinn et al., 2007). In addition, screening may be associated with child-bearing, as women described themselves as "too old" or that they "could not accept

the idea" of remaining at risk for cervical cancer. One third of women between 50–59 years of age had no intention of returning for further screening (Twinn, et al., 2007).

Physicians as facilitators to screening

Physicians could facilitate women's decision to begin screening simply by recommending it opportunistically (Twinn, et al., 2007). However, even after women decided to be screened, female practitioners could eliminate additional cultural concerns about male screeners. Importantly, Twinn and Cheng (2000) found that women expressed little preference for a female nurse over male doctors, as long as the practitioner had experience and skills. These necessary skills were defined as teaching, minimizing pain and discomfort during the test, and being considerate (Twinn & Cheng, 2000).

Summary - Determinants of cervical screening

Global evidence shows that women at the highest risk of dying from cervical cancer were older and had lower education and income. Barriers to screening for women of all ages, albeit particularly for women most at-risk, included the lack of knowledge of and the need for screening, the perception of vulnerability, the priority given to screening, and the lack of a physician recommendation. Hong Kong had a similar profile for high-risk women, and similar barriers to screening. In addition there were culturally-specific concerns and a strong preference for female screeners.

Facilitators included recommendations from physicians, encouragement from family and friends, marriage, and the degree of other health-seeking behavior.

Interventions to increase participation in screening

Global evidence for interventions targeting physicians

Consistent with the evidence that women cite a lack of a physician recommendation as a key facilitator to initiating cervical screening, interventions that targeted physicians have been shown to be effective in increasing uptake of cervical screening (Lomas, 1991; Grilli & Lomas, 1994; Snell & Buck, 1996). While there is little evidence that passive dissemination of screening guidelines can influence physician behavior, evidence does indicate the effectiveness of guidelines that were easier to try, took account of local circumstances, were disseminated by active educational interventions and were implemented with patient-specific reminders (Lomas, 1991; Grilli & Lomas, 1994; Stone, et al., 2002). Snell and Buck (1996) studied provider "activation" methods both during and outside of the patient visit. During-visit interventions, such as reminders and flowcharts, helped to remedy physician forgetfulness in suggesting screening, while outside-visit interventions, such as education and audit with feedback, helped to update the physician's knowledge and correct overestimations of their actual performance in suggesting screening.

Physician incentives were shown to be effective in increasing women's participation in screening. England provided a compelling example of this intervention. When physician incentives were added to other efforts done to create an

effective organized program in the 1990's, coverage rose from 42% to 85% from 1990 to 1998, with over 90% of physicians reaching a target of over 80% of their patients screened (Patnick, 2000).

Stone, et al. (2002) also found that targeting the physician at the environmental level was effective in increasing levels of preventive screening services. In their meta-analysis they found that several organizational changes were effective: establishing a separate clinic devoted to screening and prevention activities, planning a visit specifically for preventive activities; using quality control or continuous quality-improvement techniques, and designating preventive responsibilities to a non-physician staff. In addition, health care provider reminders and educational outreach helped change provider behavior while less active interventions, such as attending conferences, reading medical journals or mailing clinical practice guidelines were not effective.

Global evidence for interventions targeting women

There was not a clear consensus about what worked to increase participation in screening. Evidence included interventions that increased physician referrals and that addressed the lack of knowledge and psychosocial barriers(Giordano, 2009). Letters to women were the most studied, because theoretically letters can address many of the barriers preventing women from attending for screening (Byles & Sanson-Fisher, 1996). If women were aware of the importance of screening, they might need a reminder when it was time to present for a screen, and a letter could serve as a prompt for that purpose. If women did not understand the need for screening, letters could

emphasize the preventive role of Pap tests. Letters could also educate women about screening, including the benefits and risks of the tests, and where to access the test. Personal invitations might also overcome barriers to women's perceived lack of risk to themselves (Byles & Sanson-Fisher, 1996). Evidence also demonstrated that response rates rose when invitations were "sponsored" by a trusted or valued organization (Marcus & Crane, 1998). Other evidence-based interventions included mass media campaigns, and outreach. Mass media campaigns were successful, however they were expensive so typically media was only used for a short duration. However mass media was found to be most effective when used in combination with other outreach efforts, such as mailings or opportunistic screenings (Byles & Sanson-Fisher, 1996). Outreach campaigns had some success when they aimed to make the message personal, such as using outreach workers, mobile vans, or personal appeals to family and friends (Marcus & Crane, 1998).

Hong Kong evidence

There is little evidence for interventions to increase the uptake of cervical screening in Hong Kong. Health promotion campaigns could be effective, although they primarily served as a prompt for rescreening. However there is no Hong Kong-specific evidence for interventions targeting physicians, although women cited health care practitioners as an important source of information (Twinn, et al., 2007).

Summary - Interventions to increase participation in cancer screening

Screening programs were directed at populations, yet they required individuals to accept the invitation. These programs had the difficult task of encouraging women to present for a screen, and then to return for follow-up care if results are abnormal. Effective interventions to encourage screening addressed key barriers for the women, such as educational and psychosocial barriers, or addressed physicians as the gatekeeper and influential motivator. No evidence indicated whether it was more effective to target physicians or women.

III. Discussion

Strength and weakness of studies

The literature review is strengthened by the depth and breadth of the peer-reviewed research done on cervical cancer screening, both in Western countries and in Hong Kong. The evidence for organized screening programs and for determinants of screening was strong, and the Hong Kong evidence was similar to the Western literature. However, aside from the evidence contributing to the elements of organized screening programs, such as population-based invitations, the evidence for interventions to increase the uptake of cervical screening was neither consistent nor comprehensive, with little research done on Hong Kong-specific interventions directed at physicians.

Implications for Hong Kong

The evidence for an organized screening program's ability to reduce the incidence and mortality of cervical cancer is compelling and addresses the potential for Hong Kong to reduce outcomes in line with its level of economic development. Hong Kong women should benefit from the elements of organized screening that were included in the CSP, such as the recommended age and interval targets, the quality assurance, the capacity for follow-up and treatment, and the registry for surveillance and analysis. However the CSP lacked key evidence-based program elements, such as interventions to increase provider screening recommendations; a comprehensive call-recall system; targeted interventions towards those most at risk; efforts to reduce inappropriate over-screening; and a referral system for abnormal tests. Without specific, evidence-based efforts to overcome the barriers to screening, Hong Kong might find it difficult to realize its objective of the 80% participation necessary to achieve the desired population reductions in incidence and mortality for cervical cancer.

IV. Theoretical model of adoption

Just as theories or models enhanced the effectiveness of interventions for cancer screening by guiding the complex practices of behavioral change at the individual level, theories could guide the adoption of an intervention at the organizational or settings level (Glasgow, Marcus, Bull & Wilson, 2004). Everett Rogers' Diffusion of Innovations model (DOI) has been used to support the development of dissemination programs, and to analyze the transfer process (Finney

Rutten, Nelson, Meissner, 2003; Prochaska, Fromont, Suchanek, Hudmon & Cataldo, 2009). Rogers' defined dissemination as the "planned process of creating awareness of the program or interventions among the targeted population, informing stakeholders about the innovation and persuading them to try it" (Rogers, 2003).

Rogers defined four main elements involved in the Diffusion of Innovation, where diffusion was the "process by which: a) an innovation; b) was communicated through certain channels; c) over time; d) among the members of a social system" (Rogers, 2003).

All innovations are not equivalent, and their characteristics influenced their rates of adoption. *Relative advantage* was the degree to which an innovation is perceived to be better than the previous idea. Perception of advantage, which can be influenced by economics, social prestige, convenience, or satisfaction, was more important than objective metrics. *Compatibility* was the degree to which the innovation was perceived to be consistent with the potential adopters' past experiences, current values and future needs. *Trialability* was the degree to which an innovation might be experimented with, without permanent commitment, so that it was less risky. *Observability* was the degree to which the result of an innovation could be seen by others, thereby stimulating peer discussion and allowing others to observe the experience. Finally, *complexity* was the degree to which an innovation was perceived as difficult to understand and difficult to use. Higher levels of relative advantage, compatibility, trialability and observability, and lower levels of complexity, drove adoption more rapidly.

Innovations depended upon the communication channels to be spread; Rogers' defined a communication channel as "the means by which messages get from one individual to another" (Rogers, 2003). Communication channels could range along a continuum from mass media, which was an efficient way to increase awareness and knowledge of an innovation, to interpersonal channels for direct communication. Among the types of interpersonal communication, people were most likely to accept an innovation from someone most like herself.

This decision process involved *knowledge*, the step of becoming aware of and learning about the innovation; *persuasion*, the formation of a favorable or unfavorable attitude about the innovation; the *actual decision*, the choice the person made about the innovation; *implementation*, putting the innovation into use; and *confirmation*, seeking reinforcement about the adoption decision with the potential to reverse the first decision. At the end of this decision process the person might decide either to adopt or to reject the innovation.

The last element of the diffusion adoption model was the social system, defined as "a set of interrelated units that are engaged in joint problem-solving to accomplish a common goal" (Rogers, 2003). Certain types of individuals influenced diffusion into the system more than others: opinion leaders, who derived their status unofficially through technical competence, social accessibility and conformity to the system's norms; and change agents, who were professionals who represented change agencies outside the system. Importantly, both types of individuals could serve to facilitate innovation, or to slow it down or prevent it.

V. Implications for research

This literature review identified the opportunity for an organized screening program to effectively, efficiently and equitably reduce the incidence and mortality of cervical cancer. The literature also identified the key determinants of cancer screening, and demonstrated that effective interventions to increase the uptake of screening included increasing physician referrals. The importance of the physician's role in encouraging the uptake of screening contrasts with the low rates of physician participation in Hong Kong's CSP. This gap highlights the need to understand factors influencing the physician' participation in the CSP. Rogers' Diffusion of Innovation proposes a framework for studying the dissemination of an innovation, such as the CSP. Therefore, the study will utilize the concept of "adoption" and its components as the theoretical framework to study the physicians' participation in the CSP.

CHAPTER 3

METHODS

The literature identified the crucial role of physicians in encouraging the uptake of screening, which led to this study's focus on enrolling physicians in the CSP. This chapter delineates the methods used to study the factors influencing the physicians' participation in the CSP. The chapter presents the major components of the discussion guide, and discusses the changes made following pilot testing. Next, it reviews the sampling strategy and analyzes the resulting study sample. The chapter also discusses the data analysis, including the coding and the qualitative analysis procedures. The chapter concludes with a discussion of efforts to increase study validity and reliability, as well as the limitations of the study.

I. Study Design

Sixteen key informant interviews with physicians were conducted in Hong Kong over the period of January to March 2011. The objective of the interviews was to explore the factors that have, or might, influence their decision to participate in the CSP. Rogers' Diffusion of Innovations, and its focus on the individual's adoption-decision process, served as a theoretical framework for analysis. The interviews explored such factors as the physician's perception of the characteristics of the program, their communication channels, and their innovation-decision

process. Physicians, whether familiar with the CSP or not, were given a description of the program to read before the discussion (*CSP Description is found in Appendix C*).

Discussion guide pilot testing

The Discussion Guide was pilot tested with two physicians; one was a member of the original Cervical Screening Task Force, and one was in private practice. They were a convenience sample chosen either for their knowledge of the program or for their experience as a private practitioner, respectively. Both physicians had difficulty answering theoretical questions about their adoption-decision process so it became necessary to develop and include questions about actual innovations that were familiar to them. After some trial and discussion, two innovations were identified that would provide appropriate insights into the physicians' decision process: a government flu vaccine voucher program, or more commonly known in Hong Kong as a *scheme,* and the HPV vaccine.

The government's flu vaccination scheme, introduced in 2009, offered people over 65 years of age a HK$50 voucher (about US$8) to offset the cost of a flu shot at a private physician's office. Most private physicians who were General Practitioners (GPs) and Family Practitioners (FPs) joined the scheme. The program required physicians to register with the government, and to perform certain administrative tasks for accounting purposes, such as recording the patient's identifying data, and checking the availability of the voucher online. The program's characteristics were similar in many ways to the CSP: it was a

government program; it applied to a large percentage of the population; it was computer-based; it required the patient and the physician both to register; and it was introduced to the target populations in a similar manner. However, unlike the CSP, the flu vaccine offered a financial subsidy to the patient that they could apply toward the provider of their choice.

The second alternative innovation was the HPV vaccine. OB/GYNs did not provide general patient care, so the HPV vaccine was more appropriate for these specialists. The key similarity with the CSP was that the vaccine was also associated with cervical cancer, and therefore was likely to have similar cultural associations with promiscuity and premarital sexual activity. The differences between the HPV vaccine and the CSP related to their source and their method of introduction: the HPV vaccine was offered by private pharmaceutical companies, and the companies' promotional efforts were well-funded, highly-visible, and memorable (*See Appendix B for the Discussion Guide for Key Informants).*

II. Participant Selection

Sampling frame

Cervical screening rates can be influenced either directly, by attempting to change the behavior of the women, or indirectly, by working with physicians to recommend screening to their patients. This study focused on the physicians' role, so the *unit of analysis* was the physician.

Sampling strategy

The sampling strategy utilized both snowball sampling, after the initial referrals from the physicians' association leaders and HKU School of Public Health (SPH) professors; and purposeful sampling, to include a representative mix of genders, specialties, districts and CSP-registered physicians. This sampling was more difficult than anticipated, as only about half of the physicians interviewed were willing or able to recommend a colleague to interview. In an effort to recruit additional physicians in different districts, particularly more men, two physicians were recruited by "cold calling" physicians on an insurance directory listing. Additionally, three physician leaders were interviewed to explore their perceptions of their association members, as well as their own experiences with the CSP.

It was originally proposed that interviews be limited to private physicians, however as the data emerged it became necessary to understand the perspective of those who had adopted and used the CSP. In this sample, too few private practitioners knew enough about the program, due to limited registration with the program. Therefore, the sample was broadened to include three physicians who were in a government or NGO multi-center clinic setting ("clinic-based" physicians), that were registered with the program as a matter of organizational policy.

Recruiting was conducted either by telephone or email, depending on the contact information given. Once the physician agreed to be interviewed, the date and time were scheduled at their convenience and in a venue when she/he could speak confidentially. All interviews except one were conducted in the physician's

office; that interview was conducted in a public restaurant. Consistent with the IRB approval, written consent was obtained prior to the interview.

Description of key informant sample

Twenty-nine physicians were approached for an interview, either via email or phone, and sixteen physicians accepted, for a response rate of 55%. This response rate was relatively low, given that most physicians contacted were personal referrals. Twelve respondents (69%) were female and four (31%) were male. For perspective, over 70% of physicians in Hong Kong are estimated to be male (Medical Council of Hong Kong, Li, 2003).

The preponderance of female key informants was the result of a disproportionate number of female physicians referred during the recruitment process, as well as a significant difference between response rates for female versus male physicians. During the snowball sampling, when key informants were asked to refer additional physicians for potential participation, they were more likely to suggest female physicians, even when specifically asked for males. When this gender bias was detected, the personal referrals were supplemented with cold calls from a local insurance company's listing; however due to the underlying male-female physician ratio, four of the five names randomly selected were male. In addition, there was a marked difference in male and female response rates: 67% of female physicians agreed to join the study (12 of 18 approached), while only 36% of male physicians agreed to join (4 of 11 approached). These differing response rates held for the physicians from the insurance listing; only one of the four male

physicians randomly contacted agreed to join the study, while the only female contacted also accepted.

Among the key informants, there was a mix of specialties, type and size of practice, and districts (Table 2: Key Informant Characteristics). Seven (44%) of the physicians were in Family Practice (FP), six (38%) were in General Practice (GP), two (13%) were OB/GYNs (GYN) and one (6%) was an Estate Doctor (ED). In terms of size of their practices, about six were in solo practice (38%); five practiced in small groups of six or less (31%); while the remaining five (31%) worked for government or large multi-site practices. The key informants had a range of experience, with the newest physician having only six years experience, about half with 10–20 years experience, and a few with over 25 years of experience. The sample was geographically heterogeneous, as the sixteen physicians worked in twelve different districts in Hong Kong. The districts reflected the economic distribution of Hong Kong's population, with the majority of the physicians working in middle income districts, a few in low-income districts and a few in the business district of Hong Kong, which had the wealthiest patient base. The majority of physicians had trained in Hong Kong, although two had trained in the U.K. and one in Australia. Most of the GP and FP physicians estimated that a majority of their patients were women, with percentage estimates ranging from 60–75%. The OB/GYNs and physicians practicing in "Well Women" clinics had female patients exclusively.

Physicians were also asked about the importance of cervical screening as a preventive practice: "On a scale of 1 to 10, with 1 'not at all important,' and 10

‘most important,’ how important is cervical screening to you as a preventive practice?” All physicians rated cervical screening in the range from 7–10, with over seven of the sixteen physicians giving it the highest rating of 10.

Table 2: Key Informant Characteristics

Spe-ciality	Sex	District	Reg'd [a]	Train in HK	Type of Practice	Patient Income Level [b]	Imp of CS [c]	Screens per month [d]	Reminder System [e]
FP	M	Central	Yes	Y	Solo	Mid	9	30	Yes
OB/GYN	F	Mongkok	Yes	Y	2 GYNs	Mid	8	50-60	Yes
FP	F	Quarry Bay	Yes	Y	4 FP/GP's	Mid	8	5-6	No
FP	F	Jordan	Yes	Y	Clinic-based	Mid	10	100	Yes
FP	F	Jordan	Yes	Y	Clinic-based	Mid	9-10	100	Yes
FP	F	Wan Chai	Yes	Y	Clinic-based	Low-Mid	10	60	Sometimes
ED	M	Hong Hum	No	Y	Estate	Mid-Low	7	None	No
GP	F	Aberdeen	No	Y	Clinic-based	Mid-Low	10	None	No
GP	M	Mei Foo	No	Aust	Solo	Mid	10	3-4	Yes
OB/GYN	F	Mongkok	No	Y	2 GYNs	Mid	8	50-60	Yes
FP	F	Central	No	UK	Solo	High	10	20-30	Yes
GP	F	Ap Lei Chau	No	Y	Clinic-based	Low	9	5-6	No
FP	F	Central	No	Y	3 GPs, 2 GYNs	High	9	30	Paper
GP / Resp	M	Chai Wan	No	Y	Solo	Mid-High	10	1-3/year	No
GP	F	Chi Fu / Central	No	HK/ UK	Solo, 2 Venues	Mid	10	10	Paper
GP	F	Kung Tung	No	Aust	3 GP's,	Mid-High	9-10	100	File Note

[a] Reg'd: Is the physician registered with the CSP? (Responses: Yes or No). [b]Patient Income Level: What is the general economic level of patients in the physicians' practice (Responses: High, Medium or Low). [c]Importance of CS: Physicians were asked: "On a scale of 1 to 10, with 1 'not at all important,' and 10 'most important,' how important is cervical screening to you as a preventive practice? " [d]Screens per month: How many cervical screens did a physician conduct per month, regardless of their participation in the CSP. [e]Reminder system: Did the physicians have a reminder system, and if so, was it electronic or another type?

III. Data Analysis:

Coding

Coding and analysis was conducted with Dedoose, a Macintosh-compatible, web-based application, that could be used for qualitative and mixed methods research (Lieber & Weisner, 2010). The transcripts were imported into the software, where the interviews were coded. The software was used for data retrieval, sorting, analysis, and output for data matrices.

Rogers' theoretical framework provided the conceptual structure for many of the codes, a priori. The aim was to define the codes so as to be "clear, operational and reliably usable" (Miles & Huberman, 1994, p. 63). After about one-third of the transcripts were coded, the codes were checked against the earlier coding, and further clarification of the decision rules was made. In addition, during the coding process, patterns or themes emerged that were not covered by the first set of descriptive codes, so two further thematic codes were added: "framing the physicians' practice as a business (business framework)," and "the physicians' perceptions of women's knowledge, attitudes and practices (KAP)." *(For further details see Appendix D for the Code Book).*

Data Management

Each physician was assigned a unique numerical code, in order to maintain the confidentiality of the data. This numerical code was used on the physician's tape recordings, data analysis and data summaries. The interviews were double-taped and verbatim transcripts were made. The tapes were kept in a locked safe and files were password protected on a home computer. When the transcripts were received, random key sections of the tapes were listened to again and crosschecked in order to increase reliability.

Analysis

Within one day of each interview, field notes that included overall impressions were written, including but not limited to key information according to each element of the theoretical framework, reflections on potential themes, and suggestions for future interviews.

During analysis the individual physician interview field notes were further consulted, and the transcripts were reread when needed for additional clarification. Matrix displays for themes and higher-level analysis were created. Data were entered into the matrices, first with supporting quotes, and then summarized into higher-level matrices. Data were analyzed first by comparing specialty, second, by comparing gender, and then by other potentially differentiating factors. Data were then sorted into two groups by registration status: the physicians registered with the program Reg), or physicians not registered with the program (NR). Within the group of those who were registered, data were also analyzed by those in private

practice versus those who were in government or large NGO clinic settings.

The most relevant matrices were organized into findings, then supported and illustrated by citations from the underlying transcripts. These quotes were then used in the Results chapter. Given that many of the physicians were non-native English speakers, some quotes were edited (noted in brackets) to correct the grammar and convey the content of the quote, although efforts were made to preserve the key informants' voice.

Also in the dissertation, quotes were identified with key physician descriptors where pertinent, such as registration status, specialty, size of practice, gender, etc. However, the descriptive data were omitted when such data would potentially identify the speaker, typically for gender or specialty descriptors. Each quote was also labeled with its numerical physician code, which helped illustrate the frequency of any individual physician's quotes. In order to verify the analytic conclusions, the following processes were used:

- **Validity**: Various methods were employed to improve validity (Mays & Pope, 2000). First, summaries of the physicians' perceptions of the CSP characteristics were examined for discrepant viewpoints. Then results were triangulated between different data sources to explore them further. Discrepancies were most frequently explored between physicians with different registration status (registered versus non-registered), different specialties, and finally different genders. The triangulation assisted in determining the validity of the perspectives. Quotes were used to demonstrate the underlying information and to present discrepant information. Finally,

reflexivity was considered, using quotes to help clarify any existing biases. Attention was paid to negative cases and considerable effort was spent illuminating the issues.

- **Reliability**: In order to increase study reliability, all of the interviews were double-taped, the transcripts were re-checked against the audio tape and post-interview contact summary notes as they were coded, and further attention to potential code "drift" was paid. Early in the coding process the code definitions were re-evaluated and subsequently five of the initial interviews were re-coded. Finally, a log of the data management and analytic methods was developed so as to document research activity.

IV. Limitations:

A) The sampling frame was adapted to accommodate the scarcity of private physicians who were both registered and active in the program, as documented above. Only three private physicians had registered with the program and therefore had personal knowledge of the program's actual benefits and barriers, which might limit the generalizability of this research to other private physicians. However, the three physicians' data were consistent with the data from the private physicians who knew of the program yet had not registered, and with the clinic-based physicians who had registered with the program.

B) The relatively high participation of physicians with higher professional qualifications, such as specialties in Family Practice (FP) or Gynecology (GYN),might limit the generalizability of the findings to the majority of the physician population who do not have advanced qualifications. However,

results between those private physicians with advanced qualifications and those without were generally similar.

C) The relatively low response rate, 55%, might also limit the generalizability of the results. Other than under-participation by male physicians (30% of key informants versus 72% of Hong Kong practitioners) the background and attitudes of the non-responders were not known. These non-responders might have different viewpoints about cervical screening, and about the CSP. Two indications of this potential bias were that most physicians responded genuinely positively to the question on the importance of screening as a preventive care measure, and that most of the physicians interviewed stated that they often suggested screening to their patients. These responses are not consistent with screening rates in Hong Kong. However, given that these attitudes were almost universal among the key informants interviewed, the finding might be indicative of attitudes, and not practices, among the larger physician population.

This chapter summarized the methods used in this qualitative study of physicians' attitudes on the CSP. It discussed evolutions in the discussion guide and the sampling strategy that evolved as the data emerged, and it delineated the data management and data analysis process. It also discussed efforts to increase study validity and reliability, and the potential limitations to the study design. The next chapter presents the results of the study, organized by the key findings, and illustrated with key informant quotes. These results will then be utilized to inform the Plan for Change.

CHAPTER 4

RESULTS

This chapter reports results of key informant interviews that examined factors influencing private physicians' under-participation in the CSP, using the methods defined in the previous chapter. The factors that were studied draw upon Rogers' theoretical framework of the Diffusion of Innovations. These findings report physicians' perceptions of the characteristics of the CSP; what communication channels might influence adoption; and what the physician's adoption-decision process was for their practice. However, as discussed in the Methods section, few physicians knew about the CSP and physicians had a difficult time responding to hypothetical questions about adopting a new program into their practice; therefore physicians were also asked to consider adoption issues in the context of the government-sponsored flu vaccine voucher, or the HPV vaccine.

During the analysis, three physician perspectives on innovation decisions emerged: (1) a business perspective; (2) a patient perspective; and (3) a public health perspective. The business perspective was most common, as physicians reported a need to ensure the financial success of their practices. As discussed in more detail in the following findings, this business framework was evidenced primarily in physicians' discussions of the "cost" of doing business and their reluctance to reduce the frequency of patient screens. Other times the physicians took their patient's perspective as they talked about such patient concerns as their desire for a female screener. Finally, from a public health perspective, the physicians

sometimes took a broader view of their role and spoke about the public health aspects of the innovations and their own contribution to said public health in Hong Kong. Aspects of these perspectives will be presented and discussed in the relevant findings, and summarized in Table 3 below.

Table 3: Research Key Findings Summary

Research Key Findings Summary	
Finding #1	Physicians perceived that the CSP's benefits were rarely meaningful to their practice (Relative advantage)
Finding #2	Many physicians perceived the CSP as time-consuming and administratively problematic (Complexity)
Finding #3	Many physicians found the CSP to be inconsistent with their perception of the women's cervical screening Knowledge, Attitudes and Practices (KAP) and their typical patient care practices (Compatibility)
Finding #4	Most physicians typically learned about potentially applicable innovations through relatively passive communication channels
Finding #5	Physicians tended to make rapid decisions about new programs, without much time for consideration, trial or consultation with others

Key Finding #1: Physicians perceived that the CSP's benefits were rarely meaningful to their practice (relative advantage)

After reading the description of the CSP that highlighted the program benefits, a few physicians could not identify any pertinent benefit. Most physicians identified the recall system and the online screening history as the most important benefits; however, these benefits were not substantially better than the status quo of their current practices.

Perceived lack of benefits

A few physicians, after reading the description of the CSP, were unable to identify any perceived benefits of the program. One physician expressed this clearly:

"I don't think that there is a need for it here; it wouldn't add any value to the way we practice now (110322, Non-registered, GP, small group)."

Registry recall and reminder system:

Most physicians identified the program's recall system as the most pertinent benefit of the program, although most physicians that performed even a minimal number of Pap tests (over 10 screens a month) found this benefit to be redundant to their own practice system. Physicians' recall systems ranged from sophisticated computer programs that sent automatic patient reminders, to penciled notations in a patient's file that the doctor would check during a patient visit. Most physicians concurred that a patient recall system should be an essential component of any general practice that conducts cervical screening, as shown in this quote:

> If the physicians don't recall the women, the women won't come back. The physicians will lose the business, right? That is why in that sense the Registry is of limited help to one's practice. You either determine to do this kind of screening and you would have your own system to make sure this follow-up happens, or basically this is not something that is a high priority in your practice (110104, Registered, FP).

Some physicians optimistically perceived that the recall system might increase their business, although this perception was only expressed by non-registered physicians. This physician, quoted talking about potential demand from the program, did not conduct many cervical screens:

> If I join the program probably more female patients may come here for regular cervical screening (110323, Male, Non-registered, GP).

Online access to patient data

Physicians differed in their assessment of whether the online screening history was a benefit to them. Naturally physicians preferred to have access to their patient's past screening results, as it would help improve patient care:

> Access to the client's smear results online, I think, is good. Actually we can know the result distributed online and we can….have a thorough understanding of the condition. I think that is good (110113, Non-registered, GP).

However, many physicians perceived the online results to be unnecessary, as physicians kept their regular patients' past records in their files and new patients generally knew a sufficient amount about their past screening results for the physician to determine their clinical history. This quote illustrates the physician's determination of a patient's past screening results:

> Pap smear results are simple. The patient will know if her past result is normal negative, or if there is something abnormal that [requires] some follow-up afterward….So the information is already adequate (110301-02, Non-registered, GYN).

Five of the six registered physicians interviewed did not perceive any benefits from the CSP. When asked about the benefits of the program, these physicians reported the same reactions as the non-registered physicians: the recall system and online access were redundant.

In contrast to the CSP's inability to add value by increasing patient demand, the flu voucher was perceived as contributing to the physicians' practices. The flu scheme was a subsidy for the patients to be used with any provider, so physicians reported competitive pressure to join the scheme. This physician's response is typical

of the physicians that joined the flu scheme because their patients requested their participation:

> Why did I participate? I have lots of patients enrolled. So I think that it's providing an extra service to my patients…a lot of patients…a lot more than from the cervical screening [program] (110309, Registered, GP).

This physician reported how the flu scheme increased her patient revenue:

> Why did I join the flu scheme instead of [the] CSP? Because I get revenue from it (110330-01, Not-registered, FP, private).

Summary

The CSP's primary benefits were not salient to physicians' practices as they were usually duplicative to existing processes or capabilities. Physicians identified the CSP's recall and reminder system as a benefit. However, most physicians who conducted cervical screening already had some type of recall system; therefore the system was not advantageous to their current practice. The online screening history feature was also not important, as most physicians would work with the women to determine her past screening history. Importantly, after joining the CSP, only one of the six registered physicians perceived the program to have any meaningful benefit for his/her practice. In contrast, the flu vaccine's strong patient demand was a unique benefit to their current practice, and resulted in almost universal adoption of that scheme.

Key Finding #2: Many physicians perceived the CSP as time-consuming and administratively problematic (complexity)

Most physicians perceived the program's administrative process to be complex and time-consuming. Often the program's complexities impacted physicians' practice costs or revenues. Some physicians also characterized the administrative demands as a distraction from patient care. However, some physicians, including a few private and all the clinic-based physicians, found the program's complexity to be manageable, and therefore not a barrier to adoption.

Administrative demands

Many physicians were concerned about the perceived time and effort required to use the system. Some physicians performed the administrative work themselves, and they reported this time as a barrier to enrollment:

> Doctors may skip the stuff that requires time since there is a time constraint in consultation (110315, Non-registered, GP).

Physicians shared their concerns that complexities of the program would result in lost time and revenue. One physician stated that, in the time it would take to conduct a screen and then complete the administrative process, the program "…. would lose business for me" (110307, Non-registered, FP). Another physician highlighted the opportunity cost of doing the administrative work: "It only takes five minutes [to screen], but in five minutes they can see another patient (110114, Non-registered, FP, private).

Cost concerns

Discussions of the flu scheme helped illuminate the business costs of the administration. Physicians talked about the time that program required to train their staff, and they complained that the program was too complicated to administer on an on-going basis:

> Having said that, it is actually costing me time, from the difficult workload and so on and so forth, to actually make it work in a private practice like this (110323, Non-registered, GP).

In addition, sometimes the paperwork was incorrect so the physicians did not receive payment:

> Well, it [administration]is complicated. Trying to explain to the patients what to sign; filling in all the forms; sending them in. If you are late you don't get paid. If the patient signs the wrong thing, you don't get paid. And you end up losing money. The patient never comes back to pay (110225, Non-registered, GP).

When questioned about the perceived administrative demands of the CSP versus the flu scheme, one registered FP (110225) said succinctly: "Similar. Just as bad."

Among the registered physicians, the private physicians were less tolerant of the complexities of the program. In this representative quote, a private physician expressed exasperation at the time and effort required to administer the program:

> I am registered. But then I have so many problems getting onto it, really! The first few times I couldn't get on the computer. The website is really not well done. I mean, honestly, the website is a deterrent for practitioners to join (110104, Registered, FP, private).

In contrast, a few of the private physicians and all the clinic-based physicians perceived the CSP administrative demands to be relatively few, as their staff support protected them from the administrative burden. One physician's quote acknowledged

the shift in the burden: “For me it’s simple, because most of the things are done by the clinic assistant” (110309, Registered, FP, clinic-based).

Summary

The CSP was perceived to be problematically complex. Physicians placed differing levels of importance on the CSP’s complexity as a barrier to enrollment depending on the degree to which their administrative staff could manage the work. For those few physicians that had the administrative capability, this complexity was not much of a problem, however most physicians had minimal staff capability, or limited time and interest to do the work themselves. In the US, the perceived complexities of the CSP and flu vaccine might be similar to physicians’ experience with insurance paperwork and approvals. However in Hong Kong most primary care patients are self-pay, so consequently physicians are unused to these types of administrative demands.

Key Finding #3: Many physicians foundthe CSP to be inconsistent with their perception of the women’s cervical screening Knowledge, Attitudes and Practices (KAP) and their typical patient care practices (compatibility)

All the physicians interviewed stated their belief that cervical screening was perhaps the most important preventive care service, and most of the physicians interviewed said that they often raised the issue with their patients. However, as described below, the CSP’s objective of increasing recommendations for cervical screening conflicted with the physicians’ perceptions of women’s KAPs about screening. In addition, the physicians also raised business concerns about the CSP’s compatibility with their preferred patient care practices.

KAP: knowledge of cervical screening

Many physicians felt the CSP was not compatible with their practice because their patient population was not knowledgeable about cervical screening. Physicians were reluctant to spend time educating and motivating their patients. This knowledge gap was particularly significant for physicians with patients of lower socioeconomic background or those in general practice:

> We have a lot more women with whom you would have to reach out to initiate screening, because they don't have very much knowledge about it. With the local population, if they don't feel that they have anything wrong with them, then they don't feel the need to do screening. They really don't. The whole concept of this kind of preventive screening is not very well established in the local Chinese population. They are very inactive rather than proactive (110322, Non-registered, GP, when working previously in low income practice area).

Conversely, this same physician who moved to a relatively high socioeconomic district, subsequently perceived that her new patients had a sufficient knowledge of cervical screening:

> The knowledge of screening here is extremely high and we really don't have to reach out to people to encourage them to have screens. They initiate a lot of it. It's seldom that we have to encourage someone to do it who hasn't done it before (110322, Non-registered, GP, when working in high income practice area).

In addition, some physicians had experienced a gradual increase in their patient's awareness and acceptance of cervical screening over time. This increase was most pronounced among the physicians who trained overseas in countries with strong preventive screening practices. In the quote below, this physician explained the differences shehad observed in herpatients over times:

> I came back straight from the UK…I was wondering why on earth these people do not want to have Pap smears done. I thought it was Chinese culture. At first it was an uphill climb for me to explain. I've even made up leaflets. I have been giving them out like anything…But after ten years now I hardly need to give any one of these leaflets to any patients; I mean I will if they are very ignorant, but I found they are asking for it rather than me having to ask them for it. I think the knowledge base has grown. People have heard about it. I think this has become the norm (110307, Non-registered, FP, relatively high income practice area).

Physicians also perceived that age was a barrier to cervical screening; physicians observed that women over 55 years were not as aware of the need for cervical screening as younger women:

> With older Chinese women, their lack of knowledge is a little bit of a barrier to doing this kind of screening (110322, Non-registered, GP).

Also age-related physical problems made screening uncomfortable:

> Getting to post-menopausal women is very difficult because physically it's a very uncomfortable examination to have post-menopause and it really is hard getting them to do that. I mean it's not a comfortable procedure and so you really need to sort of reassure them that this is necessary. And that's really hard because they feel fine and they don't see the need for it (110322, Non-registered, GP).

Importantly, the HPV vaccine provided some insights for the CSP. Physicians reported that most of their patients were not aware of, or knowledgeable about, the HPV vaccine, analogous to their lack of knowledge of the Pap test. Yet the physicians were gradually able to motivate their patient to have the vaccine. In the following quote, a GYN shared her experience introducing patients to the HPV vaccine:

> [The HPV vaccine and the Pap test] are similar because people are coming in for a check-up, and then you introduce them to the vaccine. Sometimes the patient will have the first injection at the same appointment or sometimes they will think about it. And then they call back, "I want the vaccine." And then because it just takes a few minutes, they just come in, get an injection, and I get

> them out. So there won't be any inconvenience (110301-02, Non-registered, GYN).

KAP: Screening link with promiscuous behavior

A few physicians expressed the concern that women were reluctant to undergo cervical screening because they associated it with promiscuous behavior. This quote demonstrates the perception of this cultural barrier to screening:

> I think the whole cultural thing in Hong Kong is a big thing. Basically women don't really understand why they are having the test; what does it mean when they have the test; what does the result mean? A lot of people think that by admitting they have had a cervical screen, they admit that they are promiscuous. That kind of thinking is still really prevalent so there are lots of barriers to overcome (110315, Female, Non-registered, GP).

KAP: Preference for a female physician

Most physicians attempted to increase screening among their patients. However many of the male physicians were unsuccessful because their patients preferred to be screened by female practitioners. One physician shared his experience:

> The female patients told me that usually they will find female doctors to perform this kind of screening. Very rarely they will find a male doctor (110315, Male, Non-registered, GP).

Another physician had restricted himself to reminding women to be screened, rather than suggest that he perform the screen himself:

> Some patients prefer female practitioners. They are just not comfortable with a male doctor. So for these patients I would not insist. But I will always remind them to make sure they do have a gynecological checkup with a Pap smear every two years (110104, Male, Registered, FP).

Female physicians agreed that women preferred a female screener:

> Even if a [male] GP suggests cervical screening they would say: "I want a female." And we have more male doctors in Hong Kong anyway (11301-02, Female, Non-registered, GYN).

This physician related that women's preferences for female providers were so strong that the women would even change providers rather than be examined by a man:

> I think women actually prefer to be seen by a woman doctor. Yes, some people even change the doctor, just because of the gender of the doctor (110301-01, Female, Registered, GP).

This physician conjectured that, during a gynecological exam, both the female patient and the male physician were embarrassed, and therefore the exam was not thorough:

> I think it's mostly just less embarrass[ing], because they don't want to be seen or touched by men….many patients tell me that when they do a Well Woman checkup… if they are examined by a male doctor, they are embarrassed. And then the doctor seems to be embarrassed, too. They just do it[the exam] very quickly, you know. They just think it is too embarrassing (110325-01, Female, Registered, FP).

KAP: Preference for specialist

Physicians perceived that women would prefer to visit a gynecologist, rather than a GP. Physicians reported that many women believed that only specialists could perform cervical screening:

> Usually in Hong Kong, I'll say, not many women would go to a general practitioner for screening. They want a gynecologist. And the women [female gynecologists] would be the more popular, so there's quite a lot of people that just phone in to make an appointment….just for screening (110301-02, Female, Non-registered, GYN).

> But it is interesting sometimes women from North America come here and they have the funny idea that only gynecologists are capable or experienced enough to take a Pap smear. So it seems interesting that women from North America have got this idea that family physicians can't do Pap smears or Gynie check-ups or anything like that. So initially they say: "Do I need to see a gynecologist

> to have a Pap smear?" [I reply]"No, of course you don't (110322, Female, Non-Registered, FP)."

Physicians also reported that some women would not consider having a cervical screen with the same doctor they consult for medical problems.

> Some people ask me, "I want to have a cervical screen. Can you introduce a specialist gynecologist for me?" And they have not thought of their GP, the one who would be seeing their common cold or joint paint or toothache for them. I said: "Have you talked with, you know, the doctor that you usually go to see?" [And they reply] "No, I am not going to talk to him. I think it has to be done by a gynecologist specialist for this" (110114, Female, Non-registered, FP).

A few physicians observed that some women could overcome their preference for a specialist if they were interested in saving money. One female GP who worked in a group practice with male gynecologists, benefited from some patient's desire to save money, perhaps because she was in the same practice as other specialists:

> There are patients who are regularly followed by our gynecologists, who are both males. Obviously it's a little more expensive when they go to them for their screening, so a lot of them will now choose to come and see me. They would specifically ask to see the female doctor (110322, Female, Non-registered, GP).

When asked if a woman would prefer a female family doctor versus a male gynecologist, most physicians, female and male, believed that the woman would choose the female family doctor. As one physician stated concisely: "Gender trumps specialty" (110315, Female, Non-registered, GP).

KAP: Doctor shopping

Many Hong Kong people did not have a regular primary care physician, and therefore tended to "doctor shop," as discussed in the literature review. For these

physicians, enrollment in the CSP implied that they would need to encourage their patients to be screened, however they expressed concerns that these new patients would view recommendations for opportunistic screening suspiciously. Two quotes illustrate physicians' concern about building trust before recommending opportunistic screening:

> It (opportunistic screening) is one of the routine questions I ask, especially with new patients. I usually wouldn't tell them to do it. I mean I'll tell them, I'll ask them, but they usually won't do it right away. The reason being that I don't want to make it sound like I want to do it ….because it's not free for them. They have to pay for it…I want to increase their readiness, but [I] don't want them to think that I am trying to do business in a way (110330-01, Non-registered, GP).

> Because it is very odd if you go to see a doctor, you know, and then you just go for episodic disease, and suddenly they mention "Have you thought of cervical screening?" You know, we should do that, but maybe some doctors will think that: "Will she think that I am trying to get more money from her?" They would think that maybe we should build-up some relationship first. But in Hong Kong, it seems that most people do not have a regular doctor. So these sorts of opportunistic screening activities are very much jeopardized (110114, Non-registered, GP).

Importantly, some physicians felt that the government program would help protect them from appearing mercenary.

> For certain patients, they feel it is not commercial [if a suggestion came from the government]. When a doctor sends a reminder they feel…this guy has no business. He wants me to go see him (110104, Registered, FP, private).

Physicians unable to perform cervical screens

Some physicians did not feel qualified to conduct cervical screens. One of the physician leaders voiced his concern that some GPs would be unable to conduct cervical screens, either because they did not know how to conduct a screen, or because they did not have the office facilities:

> The Doctor's Union consists of a lot of untrained GPs, you know, grandfathered in. They have good experience, but then they've never gone through proper training. And I would say that forty, fifty percent, may not have proper equipment (110104, Registered, FP, private).

In this study, none of the physicians interviewed were unable to adopt the CSP because they lacked the proper facilities. However, one physician admitted that he/she lacked the technical skills to perform a cervical screen and therefore would refer women to a specialist:

> My clinic is a small clinic and sometimes quite busy. Screening takes lots of time, and I am not very familiar with the examination of the uterus and the vagina and how to do the smear. So, usually for this kind of case, I refer to the gynecologist (110113, Non-registered).

CSP policy differs from physicians' preferred screening intervals

Many physicians reported that they screen their patients annually, despite the CSP's adoption of the Hong Kong College of Obstetricians and Gynaecologists' guidelines to reduce routine screening to every three years. Most private physicians felt that the CSP's recommended three-year frequency was incompatible with their usual practice. In support of their disagreement with the frequency guidelines, physicians referenced their need for flexibility, for either clinical (patient) or customer satisfaction (business) reasons. For example, one physician worried, almost paternalistically, about her patient's sexual health and used an annual screen to trigger a more complete check-up:

> Some of them [patients] are on the pill and they're actually having more partners than they like to admit. So really part of the Pap smear screening isn't just a Pap smear screening; it's also sexually transmitted disease screening. So in fact I am merging the two things together but that is working within the context of being a doctor. If you look at just cervical screening on its own, then there is nothing wrong with it [screening every three years]. But of course the

> family physician like me is looking at [the] patient as a holistic person (110307, Non-registered, FP).

The same physician also cited an example of the patient's preference for annual screens, in support of her patient's request for frequent screens:

> A lot of the Pap smears I do are actually people who suggested that they wanted a health check, so they do it every one to two years anyway. So they are the people that are probably the "worried well." So, yes, so they actually have a screen every year, so if I follow the CSP [frequency policy] I will lose my client. It will actually lose business for me. Even though I will try to advise them: "Oh you don't need to" (110307, Non-registered, FP).

Summary

All physicians interviewed ranked cervical screening as a very important preventive measure. However, most physicians found the CSP's policies to be inconsistent with their perceptions of women's KAP and their usual practice patterns. Among women who had not been screened, many physicians struggled with these patients' lack of knowledge of screening or cultural barriers, and found it difficult to convince their patients of the need for screening. For those women open to screening, physicians reported that their patients' preferred female practitioners or specialists. Importantly, most physicians found the policy of screening only every three years to be inconsistent with their practice; physicians preferred to screen patients at a frequency based upon their clinical judgment, or at a frequency that suited the women's preferences. Importantly, only one physician did not feel that he had adequate skills or facilities to conduct screens.

Key Finding #4: Most physicians typically learned about potentially applicable innovations through relatively passive communication channels (communication channels).

In order to understand which communication channels might influence adoption, physicians were questioned about their usual methods of receiving important health-related information. Methods of communication, including mail, email and CME, were relatively consistent for both less important communication, and for innovations such as the CSP.

Common health-related communication channels

The physicians interviewed frequently received health-related communication from the government, through the mail or electronically, which they generally trusted and found helpful. They also received correspondence from their professional associations. This physician recounted the various methods of information she utilized to stay aware of innovations:

> Well, the Department of Health sends everybody, every doctor registered, a letter of invitation. And then they have an email system, which I subscribe to. And the Medical Association Health System disseminates information. So I think information is no problem, you know, we will always be quite aware of what things are going on (110301-01, Registered, GYN, private).

CSP communication channels

Most physicians did not remember any recent communication from the government about registering for the CSP or about increasing screening among their eligible female patients. A few did remember receiving introductory information about the CSP several years earlier, usually through a mailing. One physician recalled a talk about the CSP:

> There are actually talks organized from time to time about cervical cancer and during those seminars we also get information from the Department of Health

> concerning cervical cancer screening. But I don't think they are something new….they [give] information about the cervical cancer screening program in Hong Kong (110331, Registered, FP).

No physicians recalled another physician or governmental official championing the innovation. Interestingly, several physicians felt that the pharmaceutical industry's heavy media campaign to promote the HPV vaccine had played a significant role in educating women about cervical health, and indirectly benefitted their practice:

> I guess it comes with the introduction of the cervical vaccine. I think it comes with the increasing awareness to screen for cervical things, including the vaccine, but not particularly for cervical Pap smear (110330, Non-registered, GP).

> People have been talking a lot about cervical screening because the HPV vaccine has been evolving in these two years in Hong Kong. So the public is being more and more [aware] of their need for screening (110301-02, Non-registered, GYN).

Communication channels for other innovations

When asked about how they learned about other specific innovations, such as the government flu scheme or the HPV vaccine, physicians mentioned mail, email and CME. In general, the physicians interviewed were more likely to learn about medical and programmatic innovations passively. Typically they received a mailing from the government, or read about an innovation through professional communication channels, such as their professional association's emails or newsletters. Sometimes the physicians interviewed were more active in seeking to learn about medical innovations by searching through professional channels, such as peer-reviewed journals. This physician had initiated contact with former colleagues in another country to learn about evidence-based innovations:

> I guess there are a few talks, emails, etc., but also I read some articles and WHO reports. Because of the links that I have in Australia, I get all their information (11330, Non-registered, GP).

Summary

Most physicians received regular health communication, as well as information on new programs or other innovations like the CSP, through letters, emails, or educational CME's. These communication channels were similar for all physicians. Importantly, communication from the government was considered trustworthy. In addition, physicians reported that the pharmaceutical industry's heavy promotion might have indirectly benefitted the uptake of cervical screening.

Key Finding #5: Physicians tended to make rapid decisions about new programs without much time for consideration, trial or consultation with others (adoption-decision process).

Physicians typically did not take much time between their initial awareness of an innovation and their decision to adopt it. This initial decision process was rapid due primarily to a truncated persuasion stage. During this stage, few physicians felt a need to try the program or observe another's experiences with it; however this differed by practice size. For the few physicians who had registered with the CSP, their adoption process was followed by a trial implementation period. However, after some period of time trying the program, all but one physician ultimately rejected the CSP.

General decision-making process

The solo-practice and clinic-based physicians reported an individual decision process that typically considered an innovation's scientific evidence, practical

concerns, and the endorsing organization. However while the physicians in group practice talked about making individual decisions, they also reported checking with each other, as in this example below:

> It was an individual decision. And after I talk[ed] to the other doctors they are convinced as well, so we just [went] ahead (110330, Non-registered, GP).

CSP decision process

Few physicians remembered their initial CSP decision several years before. Importantly, of the six physicians that did enroll, only one physician remained active in the program. For these six registered physicians, their adoption and early implementation experiences differed by setting. Among the three private physicians, two were unable to articulate either *what* they experienced as the program's benefits or barriers, or *why* they discontinued using the program. However, the third physician retained a clear recollection of his decision to reject the CSP. In this quote, he highlighted the program's complexity as a significant barrier that was not balanced by enough benefits to prevent him from rejecting the CSP:

> But I think the way it has been organized is probably not a very effective tool, you know. In terms of the Registry and this whole thing; the idea is good, you know. Track, offer support, you know, recall for the doctors and all that. But then in order to get onto the system, it seems so much effort (110104, Registered, FP, private).

Of the clinic-based physicians that were required to register with the CSP, two did not see any relative advantages to the program that could compel them to try it, so neither of them used the program. One of these physicians used a forgotten password as an excuse for not using the system:

> Because it has been a very, very long time [since] when it first launched. But we rarely use the system. I understand I have registered….but I never go to review whether I am still in. I think I have forgotten my password into the system as well, because there are so many passwords nowadays (110331, Registered, GP, clinic-based).

Another registered with the CSP both as a physician and as an individual, but had never used the program in either role. She was emphatic about her lack of interest in implementing the program:

> I haven't logged into the Internet. For example as a patient*or* as a client. I never logged in to look at my own record as a service provider. I never logged in to see: "Oh I have done so many patients and their results are…" (110325-02, Registered, FP, clinic-based).

The third clinic-based physician *was* positive about the innovation and was the only physician interviewed who actively participated in the program at the time of the research. This physician linked her participation to the public health benefits, rather than her perceptions of relative advantages for her practice or her patients:

> [The most important benefit is] to know the epidemiology of the disease. Then we can know how many women in Hong Kong have [had a] Pap smear, because if women just go to different clinics then there [are] no statistics about how Hong Kong is doing. But if every woman, no matter [if] they [visit] different clinics, can have access to the same program, then [for] Hong Kong, we [will] know how many women actually [had a] Pap smear. So for statistics, I think it is very important (110325-01, Registered, clinic-based).

Summary

The physicians interviewed reported a rapid decision process for both the CSP and other innovations, although only those in group practices reported seeking information and opinions from office colleagues or professional sources. Physicians who did not adopt the CSP, and two of the clinic-based physicians, appeared to have made their final innovation-decision almost immediately, after they decided that the program did not offer any relative advantages. The private physicians who registered with the program did begin to implement the CSP, although they also ultimately rejected the program, either passively for reasons they could not recall, or actively due

to the complexities of the program. Only one clinic-based physician had sustained use of the program, and confirmed her adoption decision.

V. Conclusion

This study explored the under-participation of private physicians in the CSP. Sixteen private and clinic-based physicians, including six who were registered with the program, were interviewed to study which factors influenced Hong Kong physicians' adoption of the CSP.

The data adequately answer the research question about the factors influencing physicians' adoption of the program. This study found that the CSP's benefits were rarely salient to the physician's practices; the program's administrative demands were considered time-consuming and administratively problematic; and the program's policies were often incompatible with the physicians' typical care practices or their perception of women's cervical screening KAPs. As a result, few physicians adopted the CSP, and of these, most had negative or non-memorable experiences. Only one of the physicians interviewed was still actively using the program. Although there were differing viewpoints in most areas, the data were relatively consistent across specialty, gender, years and size of practice, patient demographics and country of training.

Exploring physicians' perceptions of other recent innovations demonstrated that innovations without strong barriers, such as the HPV vaccine, *could* be adopted by Hong Kong physicians. Similarly, the flu scheme demonstrated that innovations with strong barriers but compensatory advantages, such as strong patient demand, could also be broadly adopted. The data indicate that the CSP's low adoption rate could be

explained by the physicians' perception of these barriers to adoption, without compensatory benefits.

Rogers' Diffusion of Innovation was helpful as a theoretical framework to study the factors that influenced Hong Kong physicians' adoption of the CSP, although it had its limitations. Rogers defines diffusion as: "The process by which (1) an innovation (2) is communicated through certain channels (3) over time (4) among the members of a social system" (Rogers, 2003, p. 11). Rogers' innovation characteristics of relative advantage, compatibility, trialability and observability were positively correlated with the rate of adoption, while complexity was inversely related (Rogers, 2003, 16 – 17). Applying these constructs to the CSP demonstrated that the low rates of adoption can be attributed to the physicians' perceptions that the program's complexity and incompatibility exceeded its limited relative advantages.

Rogers discusses change agents and thought leaders as two roles that might influence adoption of innovations. It does not appear that the government actively sought to utilize change agents or thought leaders as an adoption strategy, and it was unclear from this study how influential they might be. If the government had chosen to use physician leaders as change agents, this strategy would have been problematic, as the three physician leaders interviewed had negative perceptions about the program's characteristics.

Physicians' decisions to adopt the CSP are independent of their decisions to suggest cervical screening to their patients, although the CSP assumed that participation would encourage physicians to conduct more cervical screening. In this study many physicians appear to link the two decisions. Physicians implied that the

barriers to increase cervical screening, such as women's KAPs, were perceived as additional barriers to adopting the CSP. Therefore if a physician did not perform many cervical screens in his/her current practice, there was no motivation for these physicians to join the CSP.

In addition to the issues with the CSP itself, the data indicated that practice patterns do not appear to bridge the gap between prevention-minded physicians and high-risk women. Screening remained an individual patient–physician decision that did not prioritize the broader public health goals. Women who have been screened were more likely to visit female GPs or OB/GYN specialists. These female or specialist physicians were, however, the physicians most likely to suggest screening to their patients, perpetuating their over-screening. Conversely, the women who had not been screened regularly might frequent various GPs or male doctors that werereluctant to suggest screening. Therefore, these high-risk women might not have beenoffered appropriate cervical screening.

The objective of this study was to explore the factors driving physician's under-participation in the CSP, in order to inform and influence potential improvements to the program. This study provided some explanation for the lack of improvements in cervical screening effectiveness, efficiency or equity, despite the CSP's efforts with physicians. Unfortunately, the negative factors driving physician's under-participation in the program, and the lack of program outcomes, indicate that policy changes need to be substantial. The next chapter, the Plan for Change, explores the policy implications of these findings.

CHAPTER 5

PLAN FOR CHANGE

I. Introduction

This chapter builds on the key findings to suggest a Plan for Change to inform and influence policy considerations. It begins by reviewing the most relevant findings of the research and suggests three policy alternatives to the current CSP policy, as well as an evaluation plan. The chapter then contextualizes the policy environment with a brief history of the policy process that led to the establishment of the CSP. Finally, this chapter lays out the Plan for Change to influence this policy, introducing Kingdon's theory of the policy process to guide the implementation plan.

The Plan for Change builds on the overall objectives of the CSP. The CSP aimed to increase Hong Kong's rates of cervical screening by encouraging physicians to increase screening among their patients and by educating and motivating women to be screened. This study focused on the physician component of the program. In analyzing the study findings and presenting the Plan for Change, it is important to separate a physician's decision to adopt the program from her/his decision to increase screening among her/his patients, as they derive from different decision criteria. The data provided insights into the physicians' perceptions of the CSP, their perceptions of the determinants of their patients' cervical screenings, and their adoption-decision processes.

The study findings indicate that the CSP was not conducive to adoption by the

physicians interviewed; as most of its characteristics were generally perceived as either negative or nominally beneficial (Table 4). The program's primary characteristics that were designed to benefit physicians included a patient recall system and online access to the patients' screening history. However the physicians did not perceive these characteristics as beneficial, because they were redundant to most practices' systems. The CSP also provided evidence-based screening frequency guidelines for cost-effective population protection, however these guidelines were problematic, as they could affect physicians' practice revenues; the physicians interviewed reported that reducing the frequency of their patient's cervical screens' from every year to every three years could reduce their related revenues by two-thirds. Importantly, those physicians most likely to adopt the program, including both physician leaders and physicians whose employers mandated adoption, perceived more barriers than benefits to the program.

For the physicians interviewed, their adoption decision process was rapid. These physicians did not perceive the need to conduct further research into the innovation or to consult with others. This rapid decision process can benefit a program, as it did for the almost universal adoption of the flu vaccine scheme. However for the CSP, the physician's rapid decision process may be problematic because if the CSP were to be improved, physicians might not be willing to revise their decision.

Finally, the data indicated that many physicians valued cervical cancer screening, although some physicians reported cultural and practical barriers to increasing rates of screening among their patients. Some physicians found that their

patients' lack of knowledge about screening, or their preference for female or specialist providers, were significant deterrents to increasing screening. Other physicians who already conducted a large number of screens had little opportunity to increase rates, particularly those physicians whoserved a higher socioeconomic patient base, those whowere female, or those whowere specialists. The result of this socioeconomic divide was likely to be greater disparity among high-risk, under-screened patients and low-risk, under-screened patients. The CSP as it is currently designed does not address this issue.

Table 4: Implications of Key Findings

Implications of Key Findings	
Key Finding	**Implication**
Physicians perceived that the CSP's benefits were rarely meaningful to their practices (Relative advantage)	Little incentive to join the CSP
Many physicians perceived the CSP as time-consuming and administratively problematic (Complexity)	Disincentives to join the CSP
Many physicians found the CSP to be inconsistent with their perceptions of the women's' cervical screening Knowledge, Attitudes and Practices (KAP) and their typical patient care practices (Compatibility)	Effectiveness and equity gaps perpetuated, as the CSP does not restrain rates of overscreening among those physicians who currently conduct cervical screening; nor does the CSP overcome the obstacles to screening among those physicians who rarely screen.
Most physicians typically learned about potentially applicable innovations through relatively passive communication channels	Communication of new programs could utilize existing professional channels, including government and professional organizations.
Physicians tended to make rapid decisions about new programs, without much time for consideration, trial or consultation with others	If CSP is revised to make it more advantageous to the physicians, they may not be open to considering adoption again, as they already made their decision once.

Unfortunately, the negative perceptions of the program, coupled with the gap between under-screened women and the physicians willing and able to screen them, indicate that CSP policy changes may need to be substantial. In essence the strategic focus on the physician, needs to be re-assessed. The following section discusses policy alternatives and then recommends an advocacy approach to influence policy change.

II. Policy Alternatives

Since the current CSP was not effective in achieving its public health goals, policy alternatives were explored. This study did not include a formal policy analysis; therefore the policy alternatives are based upon the research findings and the evidence in the Literature Review and will be discussed only briefly. A formal policy analysis would investigate a full range of options from discontinuing the program to offering a complete menu of evidence-based components. This discussion assumes that neither policy extreme is feasible. First, there continue to be public health needs to address cervical screening; therefore elimination of the program would be a major setback for women's health, and discontinuation would be difficult to justify to the stakeholders. Conversely, neither the advocates nor the government discern the political will to increase funding sharply. Therefore, this policy discussion will be confined to options that assume some level of program presence, yet do not ask for significant amounts of additional funding. A brief evaluation of the policy options, exploring their strengths and weaknesses, is also included in the discussion.

Policy options considered should utilize the large body of international evidence to modify the program to be more motivating to physicians or to focus on targeting women more effectively. The most effective evidence-based interventions for physicians include financial incentives or multifaceted programs that utilize activation methods. For women, the most effective evidence-based interventions address knowledge, psychosocial and access barriers.

The recommended policy options, discussed below, should target women for two reasons. First, because the government can communicate with women directly, it

is easier to control this approach, rather than to try to leverage the physicians' referral role. Second, this demand-side approach is more consistent with the government philosophy of the public-private approach to policy for social issues. Policy options that target physicians, such as incentives, would be expensive and would contradict the government's free market philosophy. In addition, the data about the physicians' innovation decision processes indicated that physicians maybe reluctant to reconsider their decisions to join the CSP. Therefore, these options should continue to focus on the overall objectives of the program and should not include efforts to further engage physicians. Policy options include: 1) a re-attempt to offer population-based invitations; 2) additional screening subsidies for high-risk women; and 3) increased access to screening using low-cost clinics and more female practitioners. Finally, I recommend that the CSP conduct regular and transparent evaluations of the program's effectiveness, efficiency and equity. Each policy component is discussed below and summarized in Table 5.

Table 5: Recommended Policy Components: Strengths and Weaknesses

Policy Component	Strengths	Weaknesses
Population-based invitations	• Evidence-based • Increases efficacy and equity	• Requires ruling on data privacy law • Requires agreement from another organization without public health mandate
Subsidize screening for high-risk women	• Increases equity • Fits with free market philosophy of public-private partnership	• Requires additional public spending • Requires provider registration
Increase screening access	• Builds on women's existing screening practices • Screening frequency more likely to concur with recommended guidelines	• Requires additional public spending • Will take time to train screeners
Evaluate and revise program	• Transparent • Allows for program correction to best achieve goal	• Requires responsible organizations to honestly evaluate their program, and correct any needed changes

1) Revisit offering population-based invitations

I recommend that the CSP re-attempt to offer population-based invitations, as this intervention is the strongest evidence-based method to increase screening. Population-based invitations are the essential component of organized screening programs because they aim to reach all women regardless of their socioeconomic situation, age, past screening status, etc. The key to these invitations is to find a comprehensive listing of women.

Accessing a population-based registry may be challenging in Hong Kong, however the results are measurable and worth pursuing. Initially the Privacy Commission, the organization responsible for evaluating privacy violations, prohibited the use of the database for the Hong Kong Identity Cards (HKID) which are issued to all adults. This usage should be revisited as Hong Kong's laws were amended after SARS in 2004 to accommodate public health needs. There may now be a legal basis to accomplish this acquisition (Choi, 2009).

The Hospital Authority, the statuary authority that runs all the public hospitals and many outpatient clinics, maintains a Patient Master Index (PMI) that could be a second possible source for the registry. After access to HKID registration was denied, the Task Force recommended that the CSP should attempt to utilize the PMI. Most women have used public hospital services (particularly maternity services), making the PMI a relatively comprehensive source. Although the Hospital Authority and the Department of Health were not able to resolve their software incompatibilities at the time of the CSP's launch, this database should be revisited to see if there is now a technical solution to the incompatibility.

A third potential source would be the public transportation payment system. All mass transport vendors (buses, trams, and subways) accept a shared value card. Most Hong Kong people use public transport, and have this shared value card, so this source would be fairly comprehensive as well.

2) Subsidize screening for high-risk women

A second policy component recommends subsidizing screening by offering cash value screening vouchers for high-risk women. As shown in the Literature Review, this subsidy would help eliminate cost barriers for those women who otherwise could not afford the cervical screen. The population-based annual tracking study, the Behavioral Risk Factor Survey, highlighted the demographic characteristics of the women who are under-screened, that is primarily those over 45 years of age and of lower socioeconomic status. In addition, the CSP should renew its outreach efforts through mass media promotions and collaborations with community groups.

This scheme would be consistent with the government's preferred market-based, public-private partnership model, as it would give vouchers directly to the women and they would then be empowered to visit the provider of their choice. The government will need financial accountability for the vouchers, so this option should still require participating physicians to register. However, findings from the research demonstrated that patients with flu vaccine vouchers created sufficient demand for private physicians to overcome their objections to the administrative demands of the program, therefore this policy option could build on that program's evidence.

3) Increase access to screening using low-cost clinics and more female practitioners

The third policy option recommends increasing access by building capacity at government and NGO multi-site clinics and by utilizing more female screeners. In this study, the physicians that did the most screening were the OB/GYN specialists, a

few female GP's, and the physicians in multi-site centers. The study also indicated that male physicians were unlikely to screen higher risk women. Additionally, the literature review indicated that women were more likely to see a male physician for their regular medical care, given that in the private sector male physicians outnumber female physicians at a ratio of 3:1.

NGO and government health clinics can increase access by increasing capacity with longer operating hours and more female screeners. These clinics are conveniently located but they will need to add evening and weekend hours as many lower income women have shift jobs, or are otherwise unable to attend during the daytime hours. In addition, the evidence demonstrated that physicians perceive that women prefer female screeners, therefore these clinics should increase the use of female nurses and foreign-trained doctors (who cannot otherwise qualify to practice in Hong Kong) to perform cervical screens. Female nurses and foreign-licensed doctors are less expensive to hire than physicians and should be readily accepted by women. As evidence, one Hong Kong study demonstrated that women were more comfortable with a competent female nurse than a male physician (Twinn, 2000). In addition, the Hong Kong Family Planning Association has been training and using female nurses with positive patient feedback for years (personal communication, 2010).

Not only are these clinics compatible with women's current health behavior patterns, but they also offer the added benefit that their practitioners are more likely to follow the recommended frequency guidelines (Department of Health and Department of Community Medicine, University of Hong Kong, 2004).

Evaluate CSP's outcomes versus program goals

Finally, comprehensive and transparent evaluations of the program outcomes should be conducted on a regular basis. Unfortunately, since women's participation in the CSP is currently minimal, the Registry will not be able to generate adequate epidemiological data. Therefore, data for these evaluations can be compiled from a variety of sources. First, the population-based, annual tracking study, the Behavioral Risk Factor survey, should be sufficiently detailed to demonstrate incremental screening changes among the demographic and socioeconomic subsegments. Although the data are self-reported and not independently verifiable, this tracking survey offers the added benefit of nine years of previous data. Second, to evaluate outcome data, the government should partner with the accredited laboratories to aggregate screening results and to continue to track the follow-up of abnormal results. Finally, Hong Kong's Cancer Registry already reports incidence and mortality on a population basis; therefore this Registry should contribute long-term outcome data. Together these data sources could provide a relatively complete picture of screening processes and outcomes. In addition, efficiency studies can be conducted that build on the self-reported data from the Behavioral Risk Factor Survey to model the cost of the program versus the financial benefits from reductions in over-screening, and the health improvements from growth in screening reach.

Estimated policy expenses

These policy options should incur recurring expenses for the vouchers for high-risk women and for training and personnel costs for additional screeners. Assuming

that about 300,000 women over 45 years of age would be eligible for the voucher program (Hong Kong Population By-census, 2006) the program cost of a HK$100 voucher is estimated to be HK$30 million (US$3.8M) over the three-year screening cycle. This voucher should cover different proportions of the cost of providers in different settings: it should cover the total cost of a cervical cancer screen at a government clinic; about two-thirds of the cost at an NGO clinic; and about half of the cost at a private physician. Additional hours and female screeners at the clinics should require more operational funding, although no additional capital costs. These training and operational costs can be more optimally estimated when organization-specific information becomes available.

Discussion of policy options

The strength of these recommended policy options is the opportunity they offer to increase cervical screening's effectiveness and equity. The program's effectiveness should be improved by finding a means to increase the reach of the Registry information system. In addition, targeting women at high-risk of developing cervical cancer and using evidence-based approaches to reduce screening barriers, addresses disparities in current screening practices. Finally, these policy options should be consistent with women's current care-seeking behavior, as most Hong Kong women are accustomed to choosing their own private physician or to accessing services at health clinics.

Weaknesses of these policy options include the program's inability to reduce inefficiencies, and the cost of the policy changes. First, the recommended policy may

not optimize efficiency because the program will not be able to regulate the over-screening practices of the private physicians. As observed in the research, the physicians' professional associations that established the screening interval protocols have little means of monitoring the individual practices of their members. In addition, women typically pay for their own preventive care; therefore neither the government nor insurers can exercise financial control over these private transactions.

Second, these policy options will have financial costs. Although Hong Kong's economy is healthy, any additional budgetary expenses will be difficult to justify. This program was conceptualized as a private-public partnership that operated under the premise that the government provided the infrastructure and the people paid for their own preventive care. However, even in this free market economy, there is a precedent for vouchers to be used to subsidize public health priorities.

The next section presents the Advocacy Plan. It builds on the research findings that informed the policy options and it aims to apply leadership concepts to those options to improve the likelihood of success in implementation.

III. Advocacy Plan

This section introduces an advocacy plan that fulfills the study objective of informing the current cervical health policy and influencing policy change. The three policy options and the recommended evaluation plan are offered as the focus of the advocacy effort. This advocacy plan is a road map that will describe the target audience, the implementation and communication plans, and the resources needed to influence the policy. The need for non-traditional leadership skills is also discussed.

This advocacy plan begins with a history of past cervical health advocacy in order to provide context for the recommended Plan for Change.

Cervical Screening Advocacy History

Advocacy for cervical health has a substantial history in Hong Kong and future advocacy efforts should benefit by building on this history. This history can be analyzed within the framework of John Kingdon's theory of the multiple stream model of the policy process. Kingdon's theory was chosen as it best represents the policy opportunity that created the CSP, and it helps demonstrate the policy barriers to improving the program.

Kingdon's theory explained how a particular policy issue might only be offered a limited opportunity to be enacted (Kingdon, 1984). A *policy window* is created when three *streams* of actors and processes come together: the problem, the policy and the political. The first stream, the problem, must rise to the level where there is public recognition of the problem, usually through some focusing event or feedback that raises its profile. In the second stream, advocates or policymakers work to develop and refine alternative policy proposals. Finally, some event will precipitate a level of policy prominence among politicians, such as a perception of national mood or an agreement on the issue. Typically these streams operate independently, until *a window of opportunity* opens and permits *policy entrepreneurs* to integrate the three streams, resulting in policy change (Kingdon, 1984).

For the CSP, the problem stream (disproportionate rates of cervical cancer), advanced initially from the academic and medical communities, before it spread to

advocates. The territory's two schools of public health were studying the determinants of screening, and the mortality impact of the low rates of cervical screening. Researchers had modeled various parameters of an organized screening program and found that it could decrease cervical cancer incidence by about 40% (Adab, McGhee, Yanova, Wong and Hedley, 2004). Local research also indicated that the determinants of screening in Hong Kong were similar to the global evidence, and that evidence-based interventions to increase screening might be appropriate if introduced (Adab, 1999; Adab, McGhee, Yanova, Chin, Wong & Hedley, 2000; Chang & Hazlett, 2002; Twinn, Holroyd, Fabrizio, Moore & Dickinson, 2005, Leung, 2010).

I initiated the patient advocacy effort in the early 2000's, while working at the Hong Kong Cancer Fund (HKCF). The HKCF is an NGO that provides cancer information and professional support to anyone affected by cancer. Inspired by the toll enacted by this preventable cancer, I led the NGOs growth into advocacy. Gary Yukl defines leadership as a "process of influencing others to understand and agree about what needs to be done and how to do it, and the process of facilitating individual and collective efforts to accomplish shared objectives" (Yukl, 2006, p. 8). Yukl's leadership strategy enabled the transition from advocacy vision to execution of policy. The initial efforts were limited as funding was secured for a promotional campaign while I reached out to stakeholders and allies to broaden and deepen the program. The second and third year the efforts merged with the academic and medical communities' advocacy efforts to launch an evidence-generating, community-based Cervical Cancer Coalition. This was a partnership consisting of grass-root women's and cancer advocacy groups, academics, physicians, NGO and government clinics, and consumer

product companies that marketed to women. The coalition developed advocacy leaders through an organic process outside traditional leadership models that helped to further develop the advocacy efforts (Erickson, 1995).

The fourth year, the problem, political and policy streams were integrated during a policy window that was successful in obtaining government commitment for a cervical screening program. A Cervical Screening Task Force was established to develop the policy parameters. In Hong Kong, this type of policy-making task force is customarily composed of government officials, academic experts and physicians' association leaders. However, because of our work advocating for the issue, the HKCF was allocated a position on the task force. The Cervical Screening Program was developed and introduced in 2004, and the task force still retains the obligation to monitor and evaluate the program.

Advocacy plan: target audience

London (2008) acknowledges that advocacy is a process. Rather than beginning with a defined plan, advocacy may be initiated by a perceived need, in this case the need to address Hong Kong's disproportionate incidence and mortality rates of cervical cancer. Advocates next define the goal, which generally stated here is the need to improve the CSP to address effectiveness, efficiency and equity. Then advocates develop their strategy, including recognizing the stakeholders, forming alliances, and identifying the policy targets. Finally the advocates implement their plans of action, with specific strategies focused on SMART goals, that is goals that are specific, measurable, attainable, realistic and timely (London, 2008).

Although most stakeholders in cervical health are well established, this advocacy plan benefited from a Power Map approach to identify and classify all the targets (London, 2008). The process of Power Mapping not only helped to identify the stakeholders and their roles in the advocacy process; it further contextualized the policy environment by illuminating other potential connections and power structures, and acknowledging opposition. Power mapping was a three-step process of: 1) identifying all the stakeholders and their potential role in the advocacy process; 2) placing them into the four quadrants of a map defined by the degree of their power and influence, and their support for policy change; and 3) evaluating the key targets using advocacy parameters. The result is a clear Plan for Change, within these parameters. These three steps are described in more detail below.

The first step in the process was to analyze the stakeholders in order to identify and classify the groups who should be allies, beneficiaries and potential opponents, decision makers, and influencers (Figure 8). The organizations are listed below, although it is their leaders who are the specific targets for the advocacy plan. The first group was the academic community. My own department, the HKU School of Public Health (SPH), was a natural ally given their past history of advocacy and placement of academic members on the task force. The head of the SPH and a professor in health economics have both committed their support for the improvement of the CSP. Professor Sheila Twinn, who generated a large body of research on cervical screening behavior during her career at Hong Kong's other prominent SPH, has been a key supporter of this effort. Both universities have advocated for cancer control measures

for many years and the advocacy plans cannot be carried out without support and leadership from these two schools.

The primary beneficiaries identified were women's and cancer advocacy groups, as they should directly benefit from the policy's efforts to improve women's health. The third group of beneficiaries identified was the NGO multi-site clinics. They should also benefit from these policy changes as they were recommended to receive additional funding for training and operational capacity.

The next roles identified by the mapping process were the policy's likely opponents and decision-makers. Given the DOH's past reluctance to discuss or evaluate the CSP, this department was the stakeholder most likely to actively oppose this policy. In addition, the policy changes should also require cooperation with the government's Hospital Authority (HA), which may resist the data cooperation plan. Unfortunately, these likely opponents were also identified as the decision makers, as the former organization has responsibility for the CSP and the latter owns the potential registry source. In addition, the Treasury Department was identified as a secondary decision-maker as Hong Kong's budget is influenced by the Treasury's priorities.

Finally, the likely influencers were the professional physicians' associations. This category included many organizations usually organized by specialty or advanced certification, including the Hong Kong College of Obstetrics and Gynecology, the Hong Kong Academy of Medicine, the Hong Kong College of Family Medicine, the Hong Kong Society of Cytology, the Hong Kong College of Pathologists and the Doctors' Union. These associations have a long shared history and on-going projects

with the government, although as independent practitioners they often differ on policy issues.

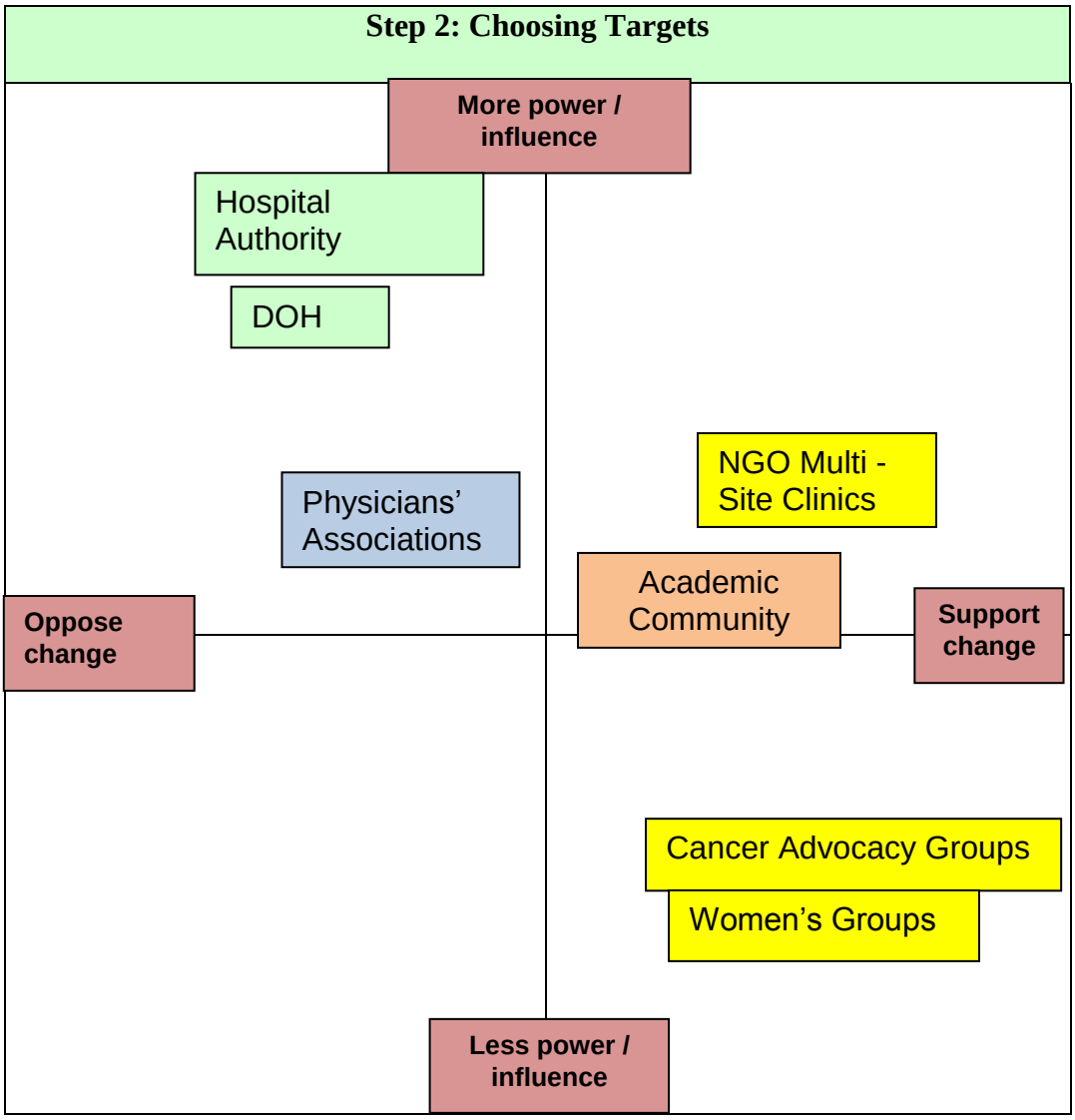
Figure 8: Power Map Step 1: Identification of Roles

Step 1: Identification of Roles	
Allies	• Academic Community (Medical Schools and Schools of Public Health at University of Hong Kong and the Chinese University of Hong Kong)
Beneficiaries	• Women's groups (Hong Kong Federation of Women, The Women's Foundation, Hong Kong Women Worker's Association, etc.) • Cancer Advocacy Groups (Hong Kong Cancer Fund, Hong Kong Anti-Cancer Society) • NGO multi-site clinics (Family Planning Association, Tung Wah Hospitals, United Christian Nethersole)
Opponents	• Department of Health • Hospital Authority
Decision Makers	• Department of Health (Secretary for Food and Health, Mr. York Chow) • Hospital Authority (Chairman, Anthony Wu) • Treasury Department (Secretary for Financial Services and the Treasury, Prof. K.C. Chan; Permanent Secretary for the Treasury, Mr. Stanley, YH Ying; Deputy Secretary for Financial Services and the Treasury, Ms. Alice Lau)
Influencers	• Physicians' Professional Associations (Hong Kong College of Obstetrics and Gynecology, Hong Kong Academy of Medicine, Hong Kong College of Family Medicine, Hong Kong Society of Cytology, Hong Kong College of Pathologists, Doctors Union)

Next these stakeholders were plotted on a power map to help determine the advocacy targets (Figure 9). First, the academic community was placed just above mid-point on the influence scale, although in the supportive change quadrant. Hong Kong is a relatively small community; therefore many of the powerful government

figures studied at the two universities and there is a symbiotic relationship between academics and government. Women's and cancer advocacy groups were placed in the lower right quadrant, as unfortunately they do not have much political power. Conversely, the sizes of the multi-site clinics and their roles in previous public-private partnerships give them more power; therefore they were the second group in the influential top right quadrant. The government departments, although most likely unsupportive of policy change, were placed in the top left quadrant to show their importance; the larger Hospital Authority was placed slightly above the Department of Health. Finally, although this research demonstrated positive support for cervical screening, and the physicians' associations have a large role on the Cervical Task Force, they were placed low in the top left quadrant until their position on this policy is known.

Figure 9: Power Map Step 2: Choosing Targets



These targets were then evaluated to determine the advocacy strategy. Three groups were selected as advocacy targets (Figure 10). Physicians' associations, and women and cancer advocacy groups were the first two targets addressed, for their support, their accessibility, and their power positions. The advocacy leadership goal for them is to galvanize their support and motivate them to influence the key target,

the DOH. The third group, the DOH was the institution with the decision-making power, and therefore the ultimate target. This evaluation is utilized in the implementation plan, later in the chapter.

Figure 10: Power Map Step 3: Evaluating Targets

Step 3: Evaluating Targets			
Checklist Criteria	**Target Option #1:** Physicians' professional associations	**Target Option #2:** Women's and cancer advocacy groups	**Target Option #3:** Department of Health (DOH)
Knowledge of the issue (High, medium, low)	Medium	Medium	High
Support objectives (Yes, No, Maybe)	Yes	Yes	No
Accessibility: • Vulnerable? • Able to switch sides? • Firm in position? • Can we neutralize their opposition?	May differ by specialty; HKAM and specialties with advanced certification will support; others are uncertain	Always have been supportive, although may be distracted by other priorities (women's groups: new minimum wage laws, social welfare needs; cancer advocates: additional funding for treatment and support)	Priorities often dictated by crisis or budget constraints
What information / arguments are most likely to sway them?	Evidence; Potential to drive their practice	Preventable cancer can be reduced efficiently; government has not delivered on promise	This policy will align with other public-private partnerships and is politically popular

Step 3: Evaluating Targets (cont.)			
Checklist Criteria	**Target Option #1:** Physicians' professional associations	**Target Option #2:** Women's and cancer advocacy groups	**Target Option #3:** Department of Health (DOH)
Can we influence them? • Do they know our organization? • Do they respond to our constituency? • Do we have influence in their constituency?	Potential to reach and influence them, through current Task Force and connections with academic community	Potential to influence through history of trust and close working relationship	Potential to influence through Task Force members and physician constituencies
Do they have political or positional power?	Yes	Occasionally, on key issues; maybe on this issue	Yes

Implementation Plan

This identification and evaluation of the stakeholders and advocacy targets was used to inform development of the implementation plan. The plan highlights the leadership skills that should be needed for implementation and acknowledges the continued role of the Cervical Cancer Task Force. Then the plan discusses the communication strategy in detail.

Specific leadership skills will be needed to drive this advocacy effort. Advocacy is unique because it draws upon non-traditional leadership models for change. The primary type of leadership needed for this effort has been defined as transformational leadership, where an advocate leads with her passion, inspiration and relationships (London, 2008). Another key type of leadership derives from influence; Yukl defines "power" as the capacity of one person to influence another, versus the

authority that comes from one's position in an organization (Yukl, 2006, p. 146). Closely tied to this influential power, a third type of leadership derives its power from one's experiential knowledge of an issue. Finally, while perhaps not strictly leadership skills, advocacy leaders need to employ strong interpersonal skills to assess the issues that are important to their partner stakeholders, and strong communication skills to channel their *voices* into the shared advocacy program (Agnew, 1999; Wasay, 2005). These skills were essential during the first advocacy effort and now advocates should again use these unique sources of power to lead efforts to change policy.

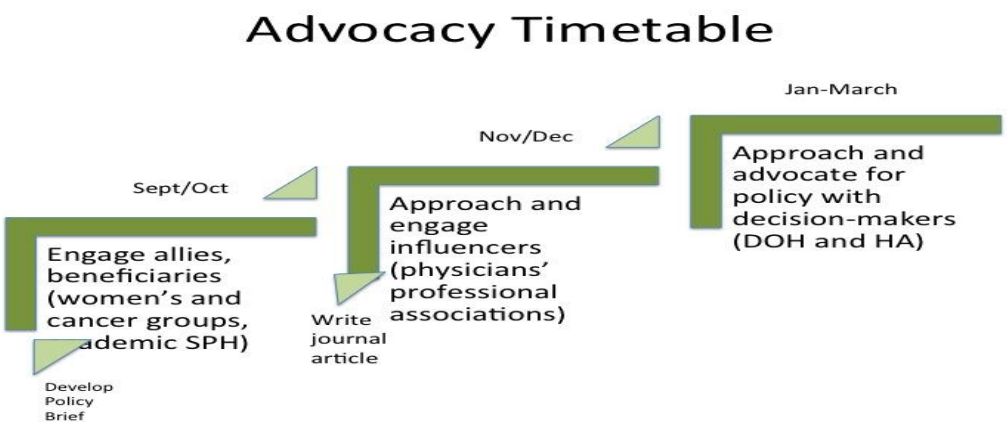
Importantly, the advocacy effort should take advantage of the Cervical Screening Task Force and work with, and through, the members as much as possible. The Task Force is composed of the key stakeholders identified in the power map, including leaders from the medical and public health academic communities, the DOH, physicians' associations, multi-site clinic providers, and cancer advocacy and women's groups. This body of participants is the organization that generated initial commitment and resources for the CSP, and its members are the most likely to lead the endeavor to support the change in policy.

From the commencement of the CSP, the Task Force was charged with evaluation and oversight of the screening program on an on-going basis. However the DOH program managers have not facilitated these fiduciary responsibilities. In personal communications over the past year, three different members of the Task Force expressed concern that they were not fulfilling their responsibilities for monitoring the program. These Task Force members were concerned that for the last three years they have not had meetings, nor received program status reports, or more

importantly, had not received a comprehensive program evaluation. This concern may be widespread among other Task Force members, and can be leveraged to reactivate their advocacy commitment.

This plan should be executed in steps, as each group's support is essential to gaining the support from the next group approached (see Figure 11). Communication should begin with the various ally and beneficiary stakeholders, and should seek to enlist their support both for the policy changes and for approaching the influencers. As described above, the academic allies will be approached through my personal contacts, although both Schools of Public Health have members on the Task Force. I work for HKU's SPH and already have general commitment from a key professor and the department chair, pending the outcome of the research. I can also ask Sheila Twinn or a current facility member on the Task Force to facilitate a meeting with the leadership of the Chinese University's SPH. In these meetings, I will share my research findings and ask for their support.

Figure 11: Advocacy Timetable



The effort to gain the support of the beneficiaries will utilize personal relationships, as I have worked with these groups in the past and they have representatives on the Task Force. However the two beneficiary groups are very different and will require different tactics to gain their support. The cancer and women's groups tend to be led by social service professionals or community organizers, while the NGO multi-site clinics are run by professional physician leaders. For the cancer and women's groups I will need to employ strong communication skills to help them understand the data and its implications, in order to motivate them to support this issue. However, most of the NGO leaders were involved in helping develop my research questions and facilitating interviews with their employees; therefore my approach to them will emphasize shared concerns to reinforce their commitment to improving the policy.

When these stakeholders are committed, the advocacy effort should subsequently engage the influencers, which is the various physicians' professional associations. While working with physicians can be challenging due to their limited

availability, relevant groups (GPs, FP, and GYNs) are represented on the Task Force and I also have personal relationships with most current or past presidents. Importantly, leaders of the FP and ED associations were also involved in helping develop the research question and facilitating interviews with their members. Although I work for HKU, my research was conducted as a UNC student; therefore my leadership power will derive from my many years of knowledge and advocacy in this policy area, rather than institutionally-based leadership power. In addition, I will employ coalition-building strategies by seeking the assistance of both the NGO-clinic physician leaders, as they are closely involved with their professional associations, and the academic allies, as they also have similarly familiar relationships with these professional groups.

Once the influencers are committed, the advocacy effort should leverage the influencer-stakeholder's access to approach the decision-makers. During the early stages of this research, academic allies were unable to help gain access to the DPH decision-makers. Therefore this advocacy effort will now utilize the influence of the physicians' associations to arrange the first meeting. This stakeholder group should be more successful than the academic stakeholders, as they are the group most directly involved in the CSP. Alternatively, I will work with the other committed stakeholders that are members of the Task Force (cancer and women's groups, academics and NGO-clinics) to jointly request a meeting with the DOH. This later method is least preferred since it may be premature at this first effort at communication to employ the combined influence of several stakeholders. This larger advocacy coalition should be reserved to influence the final policy decision.

The nature of this incremental advocacy plan will require an extended time frame for execution. The advocacy leaders should determine if this issue can be driven internally and kept within the policy confines of the DOH, or if the issue needs to be elevated to the larger political discourse. Importantly, during this implementation process, stakeholder groups should be encouraged to introduce alternative policy options, as the alternative ideas may strengthen the policy options advocated and should further engage the advocate partners.

Other recent public health policies, such as tobacco tax increases and nutritional labeling, offer successful models for policy change and can be studied to guide this advocacy effort. For example advocates working to raise the tobacco tax heavily promoted the benefits of the policy among the public, and the nutritional labeling advocates engaged independent research on the policy's benefits to be used to educate the relevant government department. In addition, both public health advocacy efforts utilized coalitions of academic, medical and consumer groups. Fortunately, many members of the Task Force are veterans of other policy battles, and can offer strategic guidance.

Throughout this process, the advocacy plan must acknowledge and comply with the cultural concept of *face*. This concept is an important construct in Chinese culture, somewhat similar to the Western construct of reputation. In a situation where a program failed, or someone erred, it is important to finds a means for the program or person to *save face* by not necessitating public admission of failure. The issue is resolved when a solution is suggested that corrects the situation without blame or acknowledgement of wrongdoing. In this policy situation, the advocacy effort must

keep in mind the need for the government, and the Task Force, to save face. For example, the advocacy effort should position potential policy changes as improvements to the existing policy, rather than corrections.

Advocacy targets

Below the implementation plan is discussed in detail for each stakeholder target:

- *Target Option #1: Physicians' professional associations*

  As shown in the power map analysis, physicians' association's support is crucial to influence the DOH. This research study demonstrated strong support for cervical screening among key informants, yet the physicians did not support the CSP. The advocacy communication plan should decouple the participation in the CSP from the issue of increasing cervical screening rates. Discussions should acknowledge the negative findings about the CSP, which should assist in the effort to enlist the associations' support, and to reduce the associations' potential defensiveness about individual physicians' lack of participation.

  Since the target group analysis showed that this group was more likely to be influenced by evidence, discussions with physicians' associations should utilize a policy brief (outlined below) that emphasizes the research. The College of Family Physicians, the College of Obstetrics and Gynecology, and the Hong Kong Academy of Medicine should be approached first, as these associations are the most directly involved in this issue.

- *Target Option #2: Women's and cancer advocacy groups*

  As key beneficiaries, women's and cancer advocacy groups have been supportive of the cervical screening policy from the commencement of the initial advocacy effort. Approaches to these groups should be facilitated by my past experience working for the Hong Kong Cancer Fund and my current volunteer work with women's groups. The challenge will be to mobilize their support now, as there are many other topical equity issues in policy discussions, such as the institution of a minimum wage, and revisions to retirement pension policy. Women's issues have been overlooked in recent government policies, therefore communication with these groups should sympathize with their concerns and position this advocacy effort as one that is focused on addressing the screening disparities among women.

- *Target Option #3: Department of Health*

  The communication plan should culminate with the DOH. This ultimate advocacy target should not be approached until: a) the policy options have the support of most of the Task Force members and stakeholder groups; and b) the advocacy plan has been adapted based on all stakeholder input. The implementation plan suggests that the physicians' associations approach the Department's leaders, as they are the stakeholders most likely to influence government officials. Given that the DOH may have conducted their own internal program evaluation, discussions should learn about the department's thinking

before discussing the gap between the CSP's goals and the disappointing outcomes.

Findings from this study should be used to suggest explanations for the poor outcomes. The communication approach to the DOH should position cervical screening as an essential component of primary care, aligned with the new primary care initiative. Although the department's priorities are often determined by health crises, made more urgent by heavy media coverage, these particular discussions should not be media events. Small meetings will facilitate reasoned discussion of the evidence and the policy options to mitigate the continued burden of disease. Discussions should highlight the breadth of the dissatisfaction about the CSP, and the support for policy change, to add political impact.

Resources

This advocacy effort should have enough data and potential policy options to begin the implementation plan but will need to develop some written advocacy tools. Fortunately, this implementation plan will require the application of personal resources more than independent funding. Throughout the effort, advocates should regard the Cervical Screening Task Force as their greatest resource. The specific tools needed are described in more detail below.

Additional tools:

1) Policy briefing paper:

A policy briefing paper should be developed for discussions with the influential targets, drawing on publicly available information and the key findings of this dissertation (see Table 11 for timing).The briefing paper's objectives should be to:

- Remind key stakeholders of the situation, which is the burden of the disease, the objectives of the CSP, and the outcomes to date against these objectives.
- Share the research results and a summary of the Behavioral Risk Factor Survey data. The policy brief should include the program's limited results in addition to the findings of this study, which indicate that the significant issues with the design of the program might explain the disappointing screening results overall. This research was done with a relatively small sample, therefore the data should be introduced with appropriate caution.
- Ask for their support for the recommended policy options.

2) Article in local physician's journal

An article for a local peer-reviewed physician journal, the Hong Kong Practitioner, should have a similar goal as the briefing paper, although it should be shorter and targeted to the general physician community. It should focus on the need to increase cervical screening and should discuss the recommended policy changes. Summary data of the research should show the low perceptions of the CSP's innovation characteristics, while emphasizing that participation in the CSP is not a prerequisite to increasing cervical screening among one's patients. This

journal reaches both community-based physicians and government; therefore it should ideally appear during the process of obtaining support from physician leadership and before approaching the Department of Health.

IV. Conclusion

This chapter presented a Plan for Change to influence the cervical screening policy. It first reviewed this study's key findings that were the most relevant to inform the cervical cancer screening policy. However, the findings indicate that the CSP's characteristics were not appealing to the physicians, and that the changes needed to make them attractive were expensive and philosophically inconsistent with government policy. Therefore, this chapter suggested drawing on both the research findings and the literature for effective interventions to increase screening, to focus the CSP's benefits on motivating women.

A brief history of the policy process that led to the establishment of the CSP was provided to contextualize the policy environment. The chapter then offered three policy options that focused directly on increasing screening among women, supplemented with a recommendation to evaluate and publicize the results of the program's effectiveness, efficiency and impact on disparities. Justifications for elements of the policy options were also based upon findings from the study. A rough cost estimate of the policy options was calculated. This chapter then laid out a Plan for Change to influence this policy, using the framework of Kingdon's theory of the policy process.

Within the Plan for Change, a power map process was used to identify the issues, allies, beneficiaries, opponents, influencers and decision-makers. All targets were

evaluated for their relative power and support, with a more in-depth analysis of the top three targets: physicians' associations (influencers), women's and cancer advocacy groups (allies), and the Department of Health (decision-maker and opponent). Finally, an implementation plan was presented which offers an incremental roadmap to build support and influence, while working toward an opportune policy window for change. The implementation plan includes a discussion of how each step will take place, and a timetable with the critical items noted. The last chapter of this dissertation will discuss the public health implications for this Plan for Change.

CHAPTER 6

DISCUSSION

This chapter discusses the public health implications of the recommended Plan for Change. It reviews the current status of cervical health in Hong Kong, the potential improvements to be gained, and the way the plan should use the research findings to influence policy in order to maximize public health. This chapter then identifies the potential limitations of the plan and explains why the advantages outweigh the drawbacks.

Current status of cervical health in Hong Kong

Unfortunately, seven years into the CSP, there have been few improvements to the national participation rates of screening. The latest data from the Department of Health reported ever-screened rates of 63.3%, which is virtually flat versus the 63.9% rate reported in 2004 when the program began (DOH, 2010). Efficiency has gone down since the CSP was introduced, with the rate of over-screened, low-risk women (those who report screens "once or more a year") up from 56.0% in 2003 to 62.8% in 2010 (DOH, 2010). Fortunately, there were minor reductions in disparities over this time, with increased participation among the subsection of high-risk women aged 55–65, reporting screening rates of 72.1% in 2010, versus 67.5% in 2004 (DOH, 2010). However, on

balance the CSP does not appear to have moved towards its public health goals for cervical health.

Potential public health benefits for Hong Kong

If Hong Kong could develop a more effective cervical health program, the potential gains are substantial. Other countries with organized screening programs have achieved reductions in cervical cancer ranging from 70-80%, following the 1980's widespread use of the Pap test (Day, Williams, Khaw, 1989; Cancer Research UK, 2003). In addition, these countries have maximized their efficiency and reduced disparities by optimizing their attendance rates (Koopmanschap, 1990). Hong Kong-specific models have estimated that optimizing screening reach and frequency could achieve further reductions in incidence rates of almost 45%, with an efficiency gain of a 40% reduction in the number of Pap tests needed to find a single case of invasive cancer (Adab, McGhee, Yanova, Chin, Wong and Hedley, 2000; Adab, et al., 2004;Woo, 2005).

The Plan for Change

The Plan for Change endeavors to build on this study's research findings to influence the CSP policy in order to realize the potential public health gains. The plan began with a comparison of the components of the CSP versus the components for evidence-based organized screening programs. It acknowledged that the CSP was developed within Hong Kong's philosophy of free markets. The Plan for Change will seek to inform policymakers how the program's characteristics were not attractive to physicians, and subsequently to influence evidence-based policy changes.

The Plan for Change recommends policy modifications that draw upon the evidence in the Literature Review, including 1) re-attempting to offer population-based invitations; 2) introducing subsidies for high-risk women; and 3) increasing screening access by building capacity at low-cost clinics and adding more female practitioners. In addition, a detailed evaluation plan is recommended. The Plan for Change identifies and analyzes advocacy targets, using a power map process to contextualize the policy environment. A specific communication plan was developed for the top three advocacy targets: women's and cancer advocacy groups (allies), physicians' associations (influencers), and the Department of Health (decision-maker and opponent). The advocacy plan should take a thoughtful and step-wise approach to build strategic support, and it should adapt the policy options as appropriate. This plan should utilize advocacy leadership to build support and influence, while working toward an opportune policy window for change.

However, the Plan for Change has limitations. As discussed, the policy options might not be able to dramatically reduce screening inefficiencies and they might require new expenditures, although not a significant amount. However, the Plan's largest limitation arises in the policy arena. Kingdon's concept of a policy window opened for cervical health when the CSP was introduced in 2004. However, since then the government's medical attention has shifted to more urgent infectious diseases, such as the H1N1 influenza. The government is also working on other systemic health care policy changes, such as broadening access to private insurance (Bauhinia Foundation, 2007, Lee, 2011), and building a culture of preventive care by encouraging family doctor relationships (Lee, 2011). These policies affect more of the population than just women,

or just high-risk women. In addition, cervical screening is not currently a government priority, particularly since a program is already in place.

Due to the current policy environment, the Plan for Change suggests working through influential people without engaging the media; this method should provide more opportunity for policy change without the government losing face. The implementation plan discusses the leadership challenges for this Plan for Change, and the ways that advocacy's unique leadership skills can influence policy.

Influencing policy will be a leadership challenge, particularly if advocacy is driven as an "outsider" without institutional power, such as me. This policy challenge is compounded because the government has been reluctant to discuss the CSP. In the last three years they have not convened or updated the CSP Task Force and have reduced promotional efforts for the public and the physicians. The officials responsible for the program have also passively resisted efforts to speak with Task Force members and advocates, despite my offer to conduct a comprehensive program evaluation at my own expense. This resistance may indicate other priorities or a lack of resources, or that the government has already concluded that the CSP is not a viable program.

Implications for Future Study

New research has demonstrated the potential of the HPV vaccine to prevent cervical cancer. However it will be another 20-30 years before the cohort of women who have received the HPV vaccine will enter the period when they are most at risk of developing cervical cancer. It has also not yet been determined if the vaccine will have the unintended consequence of increasing rates of cervical cancer among other HPV

strains not addressed by the vaccine. Importantly, policy strategies recommended here to address screening's effectiveness and equity should be applicable to the development of an HPV vaccine strategy; the vaccine is expensive and has already further distorted disparities in cervical health (Gramham & Mishra, 2011). Unfortunately, the public resources required to reduce these disparities will be substantial, as the HPV vaccine is more expensive than Pap tests.

Final Word

This Plan for Change should improve public health by helping to reduce the incidence and mortality of cervical cancer. It should also help to reduce the cervical cancer disparities that particularly affect older and poorer women. Although Hong Kong's incidence and mortality rates have been declining over time, its rates are not on the downward trajectory commensurate with the territory's counterparts in other developed countries. This gap represents lives that could have been saved.

Hong Kong has already experienced seven years with an ineffectual Cervical Screening Program, although it was launched with the best of intentions. Public health policy should move forward as more data becomes available; in Hong Kong, advocates should take the program's public outcomes and this exploratory research data to work toward strengthening the program. Although advocacy leadership is outside the traditional model of leadership, the history of the CSP demonstrates that advocacy coalitions have previously accomplished significant policy change. It is my hope that advocacy leadership and a clear Plan for Change should again drive policy toward improving cervical health in Hong Kong.

Appendix A:

Key Definitions

Cancer Registry: System of ongoing reporting of cancer patients in a defined population. More broadly, a Registry is a research institute that utilizes a cancer register and other information for epidemiological research (International Agency for Research on Cancer, 2005).

Cervical cancer incidence rate: The rate at which new cases of cervical cancer occur in a population (International Agency for Research on Cancer, 2005).

Cervical cancer mortality rate: The rate at which deaths from cervical cancer occur in a population (International Agency for Research on Cancer 2005).

Cohort effect: Effect of an etiological exposure or medical or societal intervention that affects differently persons born in successive birth cohorts (International Agency for Research on Cancer, 2005).

Colposcopy: Magnified visual examination of the cervix using a low-power stereoscopic binocular field microscope with a powerful light source (International Agency for Research on Cancer, 2005).

Cost effectiveness: An analysis of the costs relative to the effectiveness of a procedure or activity, or comparisons of similar activities to determine the relative degree they will achieve similar effectiveness (International Agency for Research on Cancer, 2005).

Diffusion:

- The passive process by which a program or product is absorbed into more widespread use, NCI Consensus Definition (Schiffman, Schneider, Murray, Brugha & Gilson, 2008).
- The outcome of the dissemination effort (Rogers, 2003).

Dissemination

- The active promotion or support of a program to encourage its widespread adoption, dissemination involves the adaptation, evaluation, implementation and maintenance of an intervention (Schiffman, Schneider, Murray, Brugha & Gilson, 2008).
- The planned process of creating awareness of the program or interventions among the targeted population, informing stakeholders about the innovation and persuading them to try it (Rogers, 2003).

Effectiveness: The reduction in incidence of and/or mortality from invasive cervical cancer due to screening practice, under real conditions and among those in the target population (International Agency for Research on Cancer, 2005).

Efficacy: The reduction in incidence of and/or mortality from invasive cervical cancer under ideal conditions (in randomized trials) among those screened compared to the incidence or mortality in those randomized not to be screened but compliant if invited to be screened (International Agency for Research on Cancer, 2005).

Hong Kong Estate doctors: "A special group of general practitioners who practice in housing estates with a designated population catered for by a single 'estate doctor.' They provide services for longer than usual hours at affordable prices. This is possible because of a 'guaranteed' patronage by residents of the estate. The qualifications of this group of doctors vary, with most of them learning their clinical skills from experience" (Li, 2003, p. 2).

Hong Kong General practitioners: Physicians with no higher qualification (Li, 2003, pg. 2).

Hong Kong Licentiate doctors: Doctors who were trained and obtained their qualification outside Hong Kong. The majority of these doctors are from Mainland China" (Li, 2003, p. 2).

Organized screening program: Screening programs organized at national or regional level, with an explicit policy that includes several essential elements from target population to treatment (International Agency for Research on Cancer, 2005).

Opportunistic screening: Screening outside an organized or population-based screening program, as a result of, for example, a recommendation made during a routine medical consultation for the woman, consultation for an unrelated condition on the basis of a possibly increased risk for developing cervical cancer or by self-referral (International Agency for Research on Cancer, 2005).

Overdiagnosis: Detection of cervical cancers or pre-invasive lesions that would never have progressed to be clinically recognized during a woman's life (International Agency for Research on Cancer, 2005).

Overtreatment: Treatment of lesions that would never have progressed to be clinically recognized during a woman's life (International Agency for Research on Cancer, 2005).

Participation rate: Proportion of those screened among those invited according to the scheduled policy (organized screening). In a program not based on invitations, participation has the same meaning as coverage (International Agency for Research on Cancer, 2005).

Primary screening: Detection of cases of cervical cancer or of its precursor lesions among asymptomatic women without a referral diagnosis (International Agency for Research on Cancer, 2005).

Target population: The population eligible for screening, i.e., all women recommended to undergo screening according to the policy adopted (International Agency for Research on Cancer, 2005).

Screening policy: Specific policy of a screening program which dictates the targeted age group, the geographical area, the screening interval, etc. Note that both organized and opportunistic systems may have policies (International Agency for Research on Cancer, 2005).

Screening test: Test, applied to all women in a program, which results in discrimination between those who test positive from those who test negative (e.g. Pap smear). Those who test positive will be recalled or referred for further assessment or diagnostic confirmation (International Agency for Research on Cancer, 2005).

Sustainability: Making an innovation routine until it reaches obsolescence (Greenhalgh, et al., 2004).

Triage: Detection of cases of cervical cancer or of its precursor lesions among women who were initially found to have an abnormal screening test that requires further evaluation (International Agency for Research on Cancer, 2005).

Appendix B:

Physician Discussion Guide

Introduction:
Hello. My name is Cecilia Fabrizio and I am a student in the Executive Doctoral Program in Public Health at the University of North Carolina in the States. X suggested that I contact you about this study of the Cervical Screening Programme.

Provide consent: get signature

Thank you for agreeing to participate in this Study. This study will look at the physician's experience with Cervical Screening. I have asked to interview you since your practice includes women of age eligible for cervical screening.

Background Questions:
1) **What is your specialty?** (i.e. Family practice, General Practice; OB/GYN)

2) **Did you train in Hong Kong? If not, where did you train**?

3) **How long have you been in practice in Hong Kong**?

4) **What is the background of the women in your practice, such as the district they primarily come from, and the percent under and over 65 years of age?**

Baseline questions about cervical screening:

1) **Do you remember reading any professional articles or promotional materials about the need for increased cervical screening in the last three months? What about in the last year?**

2a) Do you do any cervical screening of your female patients?

2b) Can you estimate how many screens you conduct in an average month?

2c) (If they do cervical screening) **On a scale of 1 to 10, compared to other preventive health practices you use with your patients, how important is it to conduct cervical screening for your female patients?**

3) Are you aware of the government's Cervical Screening Program (CSP)?

If they ARE aware of the CSP?

- Are you registered with the CSP?

If yes,

- *What do you think about the CSP?*
- *What are the benefits of the program?*

If they are aware of the CSP but not registered, skip to 1b:

If they are NOT aware of the CSP, begin with Q1:
Diffusion Questions

Read physicians the description of the CSP

1) Innovation Characteristics:

1a) What benefits of the program are most interesting to you?

1b) Are there any barriers to your participating in the program? If yes, please explain.

Prompts:

Relative advantage vs. current screening practice?
Compatibility
Complexity
Trialability
Observability

1c) Would you consider participating in this program?

2) Personal network and communication channels:

2a) Can you give an example of a recent innovation that you adopted into your practice?

2b) Tell me how you typically learn about new policies or medical innovations that you incorporate into your practice?

Prompts:

- *Interpersonal channels, such as other physicians, professional societies, CME*
- *Mass media channels, such as communications from DH, professional journals and mass media*

***2c*) Which of these methods had the biggest influence on your decision to adopt that new medical practice or technology into your practice?**

3) Innovation-decision process: (information-seeking and information-processing)

a. Awareness knowledge
b. How-to knowledge
c. Principles knowledge (prevention)

3a) When did you become aware of the innovation, in your example?

- **Was it due to a health need you saw in your patients, or an awareness of the public health need for screening? (**selective perception**)**
- (If it was awareness) **Do you remember how it happened – was it through an outside person or source; even mass media?**

3b) What aspects of the innovation, if any, are the most beneficial for you?

3c) Once you were persuaded of the benefits of the innovation, were there other factors that helped you to make the final decision to adopt the innovation?

3d) How long did it take from when you first heard about the innovation to implementing it in your practice?

Closing: Thank you again for your time. Your information and insights are important to this study. I can provide you with a summary of the final study, once the University of North Carolina has approved it (expected by December 2011)

1

Appendix C:

Cervical Screening Program Description

The Hong Kong Cervical Screening Programme

All registered medical practitioners are invited to join the Cervical Screening Programme. This program is a public – private partnership that aims to reduce the incidence and mortality of this common, preventable women's cancer.

The program follows the guidelines of the Hong Kong College of Obstetricians and Gynaecologists (HKCOG).

- Women aged 25 – 65 are encouraged to have regular screening, along with other high-risk female populations
- After two annual, consecutive negative smears, women should be screened every three years until they turn 65, or until they have a hysterectomy

The Department of Health's new Computer Registry records all screens, tracks quality measures and issues reminders for your patients.

Benefits for physicians:

- Have your clinic information displayed in the Cervical Screening Programme website (www.cervicalscreening.gov.hk).
- Receive a free training kit containing VCDs, Cervical Screening Manual and publicity materials such as booklets and pamphlets. The training covers technical skills in smear taking and communication skills to clients.
- Have access to clients' past cervical smear results online, using the Authorization Code provided by clients.
- Receive the lists of clients due or overdue for the next smear to facilitate recall of clients.
- Your patients will receive a reminder letters to attend for regular smears.
- Receive summary statistical report on individual patient smear results.
- Receive a Certificate of Participation issued by the Department of Health.

Physicians can register online or via fax.

Evidence shows that brief advice from doctors is effective in increasing uptake of cervical screening.

Attachment D:

Coding Guide

These definitions and decision rules were used as a guide during the coding process.

I. Rogers' Diffusion of Innovation Construct Codes: Perceived Attributes of Innovations:

The following Rogers' constructs applied to both:

A) Cervical Screening Program (CSP)
B) Another innovation – this was typically another government program (flu voucher, elderly primary care voucher, or electronic medical records tied to the public hospital system) or a medical innovation, such as the HPV vaccine.

- **Relative Advantage**: "Degree to which an innovation was perceived as better than the idea it supersedes."
  Decision rules:
  - "Idea" here applied to the practice patterns (reminder system, ability to check past screening results, etc.) or to screening practices (frequency, age initiated or ended, etc.)
  - Could have been positive or negative

- **Compatibility**: "Degree to which an innovation was perceived as being consistent with the existing values, past experiences, and needs of potential adopters."
  Decision rules:
  - Values, experiences and needs included practice patterns or screening practices
  - Could have been be positive or negative

- **Complexity**: "Degree to which an innovation was perceived as difficult to understand and use."
  Decision rules:
  - Could be difficult for the physician and/or her/his office staff
  - Could have been positive or negative

- **Trialability**: "Degree to which an innovation was perceived to be able to be experimented with on a limited basis."
  Decision rules:
  - "Experimented with" could include an actual trial after registration
  - Could have been positive or negative

- **Observability**: "Degree to which the results of an innovation were visible to others."
  Decision rules:
  - Visibility could have been in a formal setting, such as CME or other professional setting, through written materials, or even through conversation.

- Could have been positive or negative

II. Rogers' Diffusion of Innovation Construct Codes: Innovation Decision Process

The following Rogers' constructs apply to both:

A) Cervical Screening Program (CSP)

B) Another innovation – this is typically another government program (flu voucher, elderly primary care voucher, or electronic medical records tied to the public hospital system) or a medical innovation, such as the HPV vaccine.

- **Innovation: How aware**: Through which channels did the physician become aware of the innovation
  Decision rules:
  - Could have been interpersonal, mass media, targeted professional channels, etc.

- **Innovation: Decision Time**: How much time elapsed between the first awareness of the innovations: a) the decision to adopt the innovation; and b) the implementation of the innovation
  Decision rules:
  - Differentiate between the time for the decision and the time for the implementation
  - If it was an annual program, use only the first instance of decision and implementation

- **Innovation: Decision Factors**: Which factors were important in the physician's decision about the innovation
  Decision rules:
  - May have included both the channel of communication and the attributes of the innovation

- **Innovation: Influence**: Of the methods used to convey information to the physician about the innovation, which was most influential in the physician making the decision?
  Decision rules:
  - May have included both the channel of communication and the attributes of the innovation

III. Additional Emergent Codes

- **Women's Knowledge, Attitudes and Behavior (KAP)**: Physicians' thoughts on what motivates or inhibits a woman's screening practices, including:
  - **Male vs. Female Doctors**: Physicians' thoughts on whether or not women have a gender preference for cervical screening, and why they might have that preference, based upon their practice experience

- **Specialist**: Physicians' thoughts on whether or not women have a preference for the type of physician to conduct their cervical screen, and why they might have that preference, based upon their practice experience
- **Other**: Other concerns, issues, etc.

- **Business Framework**: Physicians often describe or think about their practice as a business. This may include "costs" such as expenditures, revenues gained or lost, and resources used.

III. Descriptive Codes: Codes used to identify descriptive, background information on physicians. Note these codes were not used for the analysis process, but as background data, or as an indication of the breadth of data analyzed.

- **CSP Registered**: Are they registered with the CSP?
- **Training**: Where did they do their training (typically in Hong Kong, other countries, or a combination of both)
- **Practice Demographics**: The socio-demographic background of their female patients, aged 25 – 65 years
- **Specialty**: Medical specialty, and any advanced qualifications
- **CS-Imp of screening**: On a scale of 1 (low) to 10 (high), how important did they rank cervical screening as a preventive practice for their female patients
- **Reminder Systems**: Did the practice have a method of reminding women when they are due for a cervical screen?
- **Number of screens / month**: A physician's estimate of the average number of cervical screens she/he conducted per month, either scheduled or opportunistically.

Appendix E:

Summary of Key Findings
by Registered versus Non-Registered Physicians

CSP Characteristics Summary - Registered vs. Non-Registered Physicians														
Relative Advantage	**R**	**NR**	**Complexity**	**R**	**NR**	**Compat-ability**	**R**	**NR**	**Trial-ability**	**R**	**NR**	**Observ-ability**	**R**	**NR**
Recall	- +	- +	Has adequate org capacity	+	+	Fit with org process	+	+	Not Important			Not Important		
Online access to patient history	- +	- +	Complex administratively	- +	- +	Concern about perceived motives		-	Registered, then trialed	-		if person could overcome her personal experience	+	N / a
Takes too long	-	-	Simple to use	-	-	Guidelines	- +	- +						
Patient demand	+	+	Burden for patients	-	-	W's KAP: promiscuity		–						
PH benefits	+	+				W's KAP: prefers female screener	–	–						
No Incentive	+					W's KAP: Prefers GYN	–	–						
						W's Desire for privacy		–						
						Lack of knowledge		–						

R = Registered
NR = Not Registered

REFERENCES

Adab, P. (1999). Cervical cancer in Hong Kong: why are the rates so high? *Annual Meeting International Society of Technology Assessment in Health Care. 15, 78. Retrieved from http://gateway.nlm.nih.gov.libproxy.lib.unc.edu/MeetingAbstracts/ma?f=102194093.html*

Adab, P., McGhee, S., Yanova, J., Chin, W. L., Wong, C. M. & Hedley, A. J. (2000). *The pattern of cervical screening in Hong Kong*. Hong Kong: Health Services Research Committee/Health Care and Promotion Fund.

Adab, P., McGhee, S., Yanova, J., Wong, C. M. & Hedley, A. J. (2004). Effectiveness and efficiency of opportunistic cervical cancer screening: comparison with organized screening. *Medical Care, 42*(6), 600.

Agnew, B. (1999). NIH invites activists into the inner sanctum. *Science*. 83(5410). 1999-1202.

Anttila, A., Ronco, G., Clifford, G., Bray, F., Hakama, M., Arbyn, M., Weiderpass, E. (2004). Cervical cancer screening programmes and policies in 18 European countries. *British Journal of Cancer, 91*, 935-941.

Bauhinia Foundation Research Centre Health Care Study Group, Hong Kong. (2007). *Development and Financing of Hong Kong's Future Health Care, Final Report.* Retrieved from: www.**bauhinia**.org/publications/BFRC-HC-FR-EN.pdf

Blomberg, K., Temestedt, B. M., Tornberg, S. & Tishelman, C. (2008). How do women who choose not to participate in population-based cervical cancer screening reason about their decision? *Psycho-Oncology*. 17. 561-569.

Byles, J. E & Sanson-Fisher, R. W. (1996). Mass mailing campaigns to promote screening for cervical cancer: do they work, and do they continue to work? *Australian and New Zealand Journal of Public Health, 20*(3), 254-260.

Cancer Research UK. (2003). *Cancer Stats, Cervical cancer – UK*. Retrieved from http://publications.cancerresearchuk.org/WebRoot/crukstoredb/CRUK_PDFs/CSCERV03.pdf

Chan, P. K., Chang, A. R., Yu, M. Y., Li, W. H., Chan, M. Y., Yeung, A. C.,…. & Ng, H. K. (2010). Age distribution of human papillomavirus infection and cervical neoplasia reflects caveats of cervical screening policies. *International Journal of Cancer. 126*(1), 297-301. doi:10.1002/ijc.24731

Chang, A.R. & Hazlett, C.B. (2002). *A regional screening programme evaluation*. HSRC Report # 421017. Health Services Research Committee.

Choi, S.M. & Lam, P.Y. (2009). Enhancing legal preparedness for the prevention and control of infectious diseases: Experience from severe acute respiratory syndrome in Hong Kong. *Public Health*, 123, 242-246.

Clark, E.A. & Anderson, T.W. (1979). Does Screening by "Pap" smears help prevent cervical cancer: a case-control study. *The Lancet*. 7 July, 1-4.

Day, N.E., Williams, D.R. & Khaw, K. T. (1989). Breast cancer screening programmes: the development of a monitoring and evaluation system. *British Journal of Cancer, 59*(6), 954-958.

Department of Health Government of the Hong Kong Special Administrative Region, and Department of Community Medicine, University of Hong Kong. (2004). *Population Health Survey, 2003-2004*. Retrieved from: http://www.chp.gov.hk/files/pdf/full_report_on_population_health_survey_2003_2004_en_20051024.pdf

Department of Health, Government of the Hong Kong Special Administrative Region. (2010). *Annual Statistics of the Cervical Screening Programm*e. Retrieved from http://www.cervicalscreening.gov.hk/english/sr/sr_statistics.html

Department of Health, Surveillance and Epidemiology Branch, Centre for Health Protection, Government of the Hong Kong Special Administrative Region. (2004). *Topical Health Report #4: Prevention and Screening of Cervical Cance*r. Retrieved from:http://www.chp.gov.hk/files/pdf/grp-thr-report4-en-20050407.pdf

Dickenson, J. A. & Chan, C. S. (2001). Opinion survey of Hong Kong private primary care doctors about cervical screening. *Hong Kong Medical Journal*. 7, 284-90.

Eaker, S., Adami, H. & Sparén, P. (2001). Reasons women do not attend screening for cervical cancer: a population-based study in Sweden. *Preventive Medicine, 32*(6), 482-491. doi:0.1006/pmed.2001.0844

Erickson, J. (1995). NBCC's new goal: make patient advocates part of all breast cancer research decision-making. *Oncology Times*. 17, 1.

Finney Rutten, L. J.(2003). Examination of populationwide trends in barriers to cancer screening from a diffusion of innovation perspective. *Preventive Medicine*. 38, 25-268.

Galbraith, K. (2005). *Cervical cancer screening in Hong Kong: addressing inequality.* Unpublished MPH thesis, University of Hong Kong, Hong Kong.

Giordano, L., Webster, P., Anthony, C., Szarewski, A., Davies, P., Arbyn, M.,….Austoker, J. (2009). Improving the quality of communication in organised cervical cancer screening programmes. *Patient Education and Counseling, 72*(130), 133-136.

Glasgow, R. E., Marcus, A. C., Bull, S. S. & Wilson, K. M. (2004). Disseminating effective cancer screening interventions. *Cancer Supplement,* 101(5), 1239-1250.

Goldie, S. J., Gaffikin, L., Goldhaber-Fiebert, J. D., Gordillo-Tobar, A., Levin, C., Mahe, C. & Wright, T. C., for the Alliance for Cervical Cancer Prevention Cost Working Group. (2005). Cost-effectiveness of cervical-cancer screening in five developing countries. *The New England Journal of Medicine*, 353, 2158-2168.

Graham, J. E. & Mishra, A. (2011). Global challenges in implementing human papillomavirus vaccines. *International Journal of Equity Health*. (1) 27. June 30, Epub ahead of print, p 1 – 52.

Greenhalgh, T., Robert, G., MacFarlane, F., Bate, P., & Kyriakidou, O. (2004). Diffusion of innovations in service organizations: systemic review and recommendations. *Milbank Quarterly*, 82 (4), 581-629.

Grilli, R. & Lomas, J. (1994). Evaluating the message: the relationship between compliance rate and the subject of a practice guideline. *Medical Care,* 32(3), 202-213.

Gutafsson, L., Ponten, J., Zack, M., & Adami, H. O. (1997). International incidence of invasive cervical cancer after introduction of cytological screening. *Cancer Causes and Control*. 8 (5), 755-763.

Hakama, M. (1993). Potential Contribution of screening to cancer mortality reduction. *Cancer detection and Prevention,* 17(4/5), 513-520.

Hakama, M., Chamberlain, J., Day, N.E., Miller, A. B. & Prorok, P. C. (1985). Evaluation of screening programmes for gynaecological cancer. *British Journal of Cancer, 5*2, 669-673.

Hewitt, M., Devesa, S. S., & Breen, N. (2004). Cervical cancer screening among U.S. women: analyses of the 2000 National Health Interview Survey. *Preventive Medicine, 3*9(2), 270-278. doi:10.1016/j.ypmed.2004.03.035

Holroyd E., & Twinn, S. (2004). Socio-cultural influences on Chinese women's attendance for cervical screening. *Journal of Advanced Nursing, 4*6(1), 42-52.

Hong Kong 2006 Population By-census Office, Census and Statistics Department, Government of the Hong Kong Special Administrative Region. *Population By-census: Main Tables.* Retrieved from http://www.censtatd.gov.hk/products_and_services/products/publications/statistical_report/population_and_vital_events/index_cd_B1120051_dt_latest.jsp

Hong Kong Cancer Registry, Hospital Authority. (2011). *Hong Kong Cancer Stats 2008*. Retrieved from http://www3.ha.org.hk/cancereg/

Hong Kong College of Obstetricians and Gynaecologists, A Foundation College of Hong Kong Academy of Medicine. (2008). *HKCOG Guidelines: Guidelines on the management of abnormal cervical cytology No. 3)*. Retrieved from http://hkcog.obg.cuhk.edu.hk/docs/college_guidelines/Abnormal_Cervical_Cytology_revised_November_2008.pdf

Hong Kong Society of Cytology, Cervical Cytology Practice Guideline Group. (2002). *Cervical cytology practice guideline*s. Retrieved from http://www.cytology.org.hk/Download/Final%20Draft2.pdf

International Agency for Research on Cancer. (2005). *Handbook of Cancer Prevention Volume 10.* Retrieved from http://www.iarc.fr.libproxy.lib.unc.edu/en/publications/pdfs-online/prev/handbook10/index.php

Kingdon, J. W. (1984). *Agendas, Alternatives and Public Policies*. Boston, Mass and Toronto, Ontario: Little, Brown and Company.

Koopmanschap M. A. (1990). Cervical cancer screening: attendance and cost-effectiveness. *International Journal of Cancer*, *3*0(10), 1081-1087.

Koopmanschap, M. A., van Oortmarssen, G. J., van Agt, H. M., van Ballegooijen, M., Habbema, J. D., Lubbe, K. T. (2006). Cervical-cancer screening: attendance and cost-effectiveness. *International Journal of Cancer,* 45(3), 410-415. doi:10.1002/ijc.2910450305

Kwan, T. C., Chan, K. K., Yip, A. W., Tam, K. F., Cheung, A. N., Lo, S. S.,….W., Ngan, H. Y. (2009). Acceptability of human papillomavirus vaccination among Chinese women: concerns and implications. *British Journal of Obstetrics and Gynaecology. 116*(4). 501-510.

Laara, E., Day, N., & Hakama, M. (1987). Trends in mortality from cervical cancer in the Nordic countries: association with organized screening programmes. *The Lancet, 3*29(8544), 1247-1249. doi: 10.1016/S0140-6736(87)92695-X

Lee, E. (2011, June 1). Family doctors, a cure for the system's ills. *The South China Morning Post*, p. A12.

Lee, E. (2011, July 9). Who pays for what under health-care reforms. *The South China Morning Post*, p. A5.

Leung, G. M., Woo, P. S., McGhee, S. M., Cheung, A. N., Fan, S., Mange, O.,….Ngan, H.Y. (2006). Age-period-cohort analysis of cervical cancer incidence in Hong Kong from 1972 to 2001, using maximum likelihood and Bayesian methods. *Journal Epidemical Community Health*, 60, 712-720.

Leung, G. M., Woo, P. P., Cowling, B. J., Tsang, C. S., Cheung, A. N., Ngan, H. Y.,….Lam, T. H. (2008). Who receives, benefits from and is harmed by cervical and breast cancer screening among Hong Kong Chinese*? Journal of Public Health (Oxford, England),* 30(3), 282-292. doi:10.1093/pubmed/fdn034

Leung, G. M., CastanCameo, S. B., McGhee, S. M., Wong, I. O., & Johnston, J. M. (2003). Waiting time, doctor shopping, and nonattendance at specialist outpatient clinics: case-control study of 6495 Individuals in Hong Kong. *Medical Care,* 41(11), 1293-1300.

Leung, S., & Leung, I. (2010). Cervical cancer screening: knowledge, health perception and attendance rate among Hong Kong Chinese women. *International Journal of Women's Health*. 2. 221 – 228.

Li, D. K. (2003). Primary care in Hong Kong. *Asia Pacific Family Medicine*. 2. 2 – 4.

Lieber, E. & Weisner, T. S. (2010). Meeting the practical challenges of mixed methods research. In Tashakkori and Teddlie, eds. *Handbook of Mixed Methods Research*. Thousand Oaks, CA: Sage. p. 559-579.

Lomas, J. (1991). Words without action? The production, dissemination, and impact of consensus recommendations. *Annual Review of Public Health,* 12(1), 41-65.

London, M. (2008). Leadership and advocacy: dual roles for corporate social responsibility and social entrepreneurship. *Organizational Dynamics*. 37 (4). 313-326.

Marcus, A. C., & Crane, L. A. (1998). A Review of cervical cancer screening intervention research: implications for public health programs and future research. *Preventive Medicine,* 27(1), 13-31. doi:10.1006/pmed.1997.0251

Mays, N. & Pope, C. (2000). Assessing quality in qualitative research. *British Medical Journal*. 320, 50-52.

Miles, A., Cockburn, J., Smith, R. A., & Wardle, J. (2004). A perspective from countries using organized screening programs. *Cancer Supplement,* 101(5), 1203-1213.

Miles, M. B., & Huberman, A. M. (1984). *Qualitative Data Analysis* (2nd edition ed.). Thousand Oaks, CA: Sage Publication.

Miller, S. M., Siejak, K. K., Schroeder, C. M., Lerman, C., Hernandez, E., & Helm, C. W. (1997). Enhancing adherence following abnormal Pap smears among low-income minority women: a preventive telephone counseling strategy. *Journal of the National Cancer Institute,* 89(10), 703-708.

Paskett, E. D., McLaughlin, J. M., Reiter, P. L., Lehman, A. M., Rhoda, D. A., Katz, M. L.,….Ruffin, M. T. (2009). Psychosocial predictors of adherence to risk-appropriate cervical cancer screening guidelines: a cross sectional study of women in Ohio

Appalachia participating in the Community Awareness Resources and Education (CARE) project. *Preventive Medicine.* 50(1-2) 74-80.doi:10.1016/j.ypmed.2009.09.001

Patnick, J. (2000). Cervical cancer screening in England. *European Journal of Cancer,* 36(17), 2205-2208. doi: 10.1016/S0959-8049(00)00310-5

Prochaska, J. J., Fromont, S. C., Suchanek Hudmon, K., & Cataldo, J. K. (2009). Designing for disseminations: development of an evidence-based tobacco treatment curriculum for psychiatry training programs. *Journal of the American Psychiatric Nurses Association*. 14 (24), 24-30.

Rogers, E. M. (2003). Simon & Schuster (Ed.), *Diffusion of Innovatio*n (Fifth edition). New York: Free Press, A division of Simon & Schuster, Inc.

Schiffman, W. J., Schneider, H., Murray, S. F., Brugha, R., Gilson, L. (2008). Doing health policy analysis: methodological and conceptual reflections and challenges. *Health Policy and Planning,* 23, 308-317.

Snell, J. L., & Buck, E. L. (1996). Increasing Cancer Screening: a meta-analysis. *Preventive Medicine,* 25(6), 702-707. doi:10.1006/pmed.1996.0109

Stone, E. G., Morton, S. C., Hulscher, M. E., Maglione, M. A., Roth, E. A., Grimshaw, J. M.,….Shekelle, P. G. (2002). Interventions that increase use of adult immunization and cancer screening services: a meta-analysis. *Annuals of Internal Medicine,* 136(641), 651.

Twinn, S., & Cheng, F. (2000). Increasing uptake rates of cervical cancer screening amongst Hong Kong Chinese women: the role of the practitioner. *Journal of Advanced Nursing,* 32(2), 335-342.

Twinn, S. F., Holroyd, E., Fabrizio, C. S., Moore, A., Dickinson, J. A. (2007). Increasing knowledge about and uptake of cervical cancer screening in Hong Kong Chinese women over 40 years. *Hong Kong Medical Journal,* 13(2), 16-20.

Vaidya, J. S., Baum, M., Quinn, M. J., Babb, P. J., Jones, J., Adab, P.,….Hedley, A. (1999). Screening and mortality from cervical cancer. *British Medical Journal,* 319, 642.

Vellozzi,C. J., Romans, M., & Rothenberg, R. B. (1996). Delivering breast and cervical cancer screening services to underserved women: Part I: Literature review and telephone survey. *Cancer Screening,* 6(2), 65-73.

Waller, J., Bartoszek, M., Marlow, L., & Wardle, J. (2009). Barriers to cervical cancer screening attendance in England: a population-based survey. *Journal of Medical Screening*. 16, (4),199-204.

Wasay, M. (2005). Advocacy leadership training improves the level of activity and impact of neurologist advocates. *Journal of the Neurological Sciences*. 238 (Supplement 1) S481.

Woo, P. P., & Thach, T. Q., Choy, S. T., McGhee, S. M., & Leung, G. M. (2005). Modeling the impact of population-based cytologic screening on cervical cancer incidence and mortality in Hong Kong; an age-period-cohort approach. *British Journal of Cancer*, 93, 1077-1083.

World Health Organization. (2010). *Cytologic screening.* Retrieved from http://www.who.int/cancer/detection/cytologyscreen/en/print.html

Yukl, G. A. (2005). Leadership in Organizations (6th edition).New Jersey: Prentice Hall.