



# Knowledge and Attitudes of Metropolitan Women towards Cervical Cancer Prevention with Human Papillomavirus Vaccination: A Cross-sectional Study

Busaba Supawattanabodee, PhD (Statistics)<sup>1\*</sup>

Woraphot Chaowawanit, MD<sup>2</sup>

Thanaporn Kittisiam, MD<sup>2</sup>

Budsaba Wiriyasirivaj, MD<sup>2</sup>

Siriwan Tangjitgamol, MD<sup>2</sup>

<sup>1</sup> Department of Basic Medical Science, Faculty of Medicine Vajira Hospital, Navamindradhiraj University, Bangkok, Thailand

<sup>2</sup> Department of Obstetrics and Gynecology, Faculty of Medicine Vajira Hospital, Navamindradhiraj University, Bangkok, Thailand

\* Corresponding author, e-mail address : busabasupa@yahoo.com

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## Abstract

To evaluate the knowledge and attitudes of Bangkok Metropolitan women towards Human Papillomavirus (HPV) vaccinations. Thai women aged 25–65 years old who had lived in Bangkok for 5 years or over were invited to the study. Participants were asked to complete the questionnaire. 4,405 of 5,000 women completed the questionnaires. Approximately two-thirds of women had heard about HPV vaccination (61.4%). Approximately two-thirds of them had correct answers about the causes or risk factors of cervical cancer (65.7%), including HPV as an etiologic agent (67.4%). However, only few understood the relationship of HPV and cervical cancer (2.8%) or the types of HPV (6.2%). Regarding knowledge of cervical cancer and HPV, a quarter knew the method of HPV transmission (25.6%). Although most accepted the HPV vaccination (78.6%), only one-third knew about the particular groups of women who would benefit from this vaccination (34.6%). In conclusion, more than half of women knew about the cause of cervical cancer and HPV vaccine. However, only a few women knew about the relationship between HPV and cervical cancer or the types of HPV.

**Keywords:** cervical cancer, HPV vaccination, knowledge, attitude, urban area



# ความรู้และทัศนคติของสตรีต่อการตรวจคัดกรองมะเร็งปากมดลูกและวัคซีนป้องกันมะเร็งปากมดลูก : การศึกษาภาคตัดขวาง

บุษบา ศุภวัฒน์ธนบดี, ประด. (สถิต)<sup>1\*</sup>

วรพจน์ เขาวะวณิช, พ.บ. ว.ว. สูติศาสตร์ นรีเวชวิทยา<sup>2</sup>

ธรรณพร กิตติสยาม, พ.บ. ว.ว. สูติศาสตร์ นรีเวชวิทยา<sup>2</sup>

บุษบา วิริยะสิริเวช, พ.บ. ว.ว. สูติศาสตร์ นรีเวชวิทยา<sup>2</sup>

ศิริวรรณ ตั้งจิตกมล, พ.บ. ว.ว. พยาธิกายวิภาค ,ว.ว. สูติศาสตร์ นรีเวชวิทยา<sup>2</sup>

<sup>1</sup> ภาควิชาวิทยาศาสตร์การแพทย์พื้นฐาน คณะแพทยศาสตร์วชิรพยาบาล มหาวิทยาลัยนวมินทราธิราช กรุงเทพมหานคร ประเทศไทย

<sup>2</sup> ภาควิชาสูติศาสตร์นรีเวชวิทยา คณะแพทยศาสตร์วชิรพยาบาล มหาวิทยาลัยนวมินทราธิราช กรุงเทพมหานคร ประเทศไทย

\* ผู้ติดต่อ, อีเมล: busabasupa@yahoo.com

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## บทคัดย่อ

เพื่อประเมินความรู้และทัศนคติของสตรีกรุงเทพมหานครต่อวัคซีนป้องกันมะเร็งปากมดลูก เก็บข้อมูลสตรีไทย อายุ 25-65 ปี ที่อยู่ในกรุงเทพมหานคร 5 ปีขึ้นไปที่ยินยอมเข้าร่วมวิจัยด้วยแบบสอบถาม มีผู้ตอบกลับ 4,405 จาก 5,000 ราย (อัตราการตอบกลับร้อยละ 88.1) ผลการวิจัยพบว่า ประมาณสองในสาม (ร้อยละ 61.4) เคยได้ยินเกี่ยวกับวัคซีนป้องกันมะเร็งปากมดลูก ตอบสาเหตุหรือปัจจัยเสี่ยงของมะเร็งปากมดลูกได้ถูกต้อง (ร้อยละ 65.7) รวมทั้งรู้ว่า HPV เป็นสาเหตุ (ร้อยละ 67.4) อย่างไรก็ตามสตรีจำนวนน้อยรู้ว่า HPV สัมพันธ์กับมะเร็งปากมดลูก (ร้อยละ 2.8) รู้ชนิดของ HPV (ร้อยละ 6.2) ส่วนความรู้เรื่องมะเร็งปากมดลูกและ HPV พบว่าหนึ่งในสี่ (ร้อยละ 25.6) รู้ว่า HPV มีการติดต่ออย่างไร แม้ว่าส่วนใหญ่ (ร้อยละ 78.6) ยอมรับวัคซีน HPV แต่มีเพียงหนึ่งในสาม (ร้อยละ 34.6) ที่รู้ว่าวัคซีนนี้ใช้ได้เฉพาะสตรีเพียงบางกลุ่ม โดยสรุป สตรีเกินครึ่งหนึ่งรู้สาเหตุของการเกิดมะเร็งปากมดลูก และรู้ว่าวัคซีน HPV ส่วนน้อยที่รู้ว่า HPV สัมพันธ์กับมะเร็งปากมดลูกและชนิดของ HPV อย่างไรก็ตามส่วนใหญ่ยอมรับวัคซีน HPV

**คำสำคัญ:** มะเร็งปากมดลูก, วัคซีน HPV, ความรู้, ทัศนคติ, เขตเมือง

## Introduction

Cervical cancer is the fourth most common cancer in women worldwide with an estimated 528,000 new cases and 266,000 deaths in 2012<sup>1</sup>. The majority of cervical cancer (84% or 445,000 cases) and deaths (87% or 230,000 cases) occur in less developed regions<sup>1</sup>. These high incidence and mortality rates in less developed regions are partly because the majority of the patients have locally advanced stages or advanced stage cancers at the time of diagnosis<sup>2</sup>. In Thailand, cervical cancer is the second most common cancer among women. In 2012, the numbers of new cases and deaths from cervical cancer were 8,184 and 4,513, respectively<sup>3</sup>.

Human Papillomavirus (HPV) is the most important cause of anogenital warts and cervical cancer<sup>4</sup>. The virus is divided into two major groups. First is low-(LR-HPV) risk HPV group and second is high-risk HPV group (HR-HPV). The majority of HPV infections spontaneously subside. While some infections may be persistent, especially with HR-HPV. This latter group of women have a higher risk of cervical cancer development. The most common types of HR-HPV causing cervical cancer are types 16 and 18<sup>5</sup>.

An effective cervical cancer screening with cervical cytology and/or HPV testing can detect pre-invasive cervical lesions or early stage cancer. However, a suboptimal screening coverage, particularly in less developed countries, is still a major problem that has led to the unsuccessful reduction in cervical cancer<sup>6</sup>.

The US Center for Disease Control and Prevention has initially suggested that an individual should receive the vaccine starting from the age of 9–15 years old<sup>7</sup>. With the use of HPV vaccinations against HPV type 16 and 18 infection, the incidence of cervical cancer should be more effectively controlled<sup>8</sup>. The subsequent recommendation has later been extended to an age that is older than

16–26 years<sup>9</sup>. To date, the HPV vaccination program has been included as an essential vaccination program in girls or even boys in many countries, such as Australia, England, etc.<sup>10</sup>.

During the previous decades when the HPV vaccine was newly launched, there were many studies investigating the knowledge of HPV and HPV vaccine as well as knowledge, attitude and acceptability of HPV vaccination among students and their parents. Few studies in Asia reported moderate to poor knowledge about HPV infection and HPV vaccination<sup>11</sup> and low rate of HPV vaccination<sup>12</sup>. In Thailand, the HPV vaccine has been readily available commercially since 2007. In the early phase after the introduction of this vaccine, there were many studies investigating the knowledge, attitude, acceptability of school students and their parents toward HPV vaccination. This included our group cross-sectional survey of 1997 parents of female students in private and public schools in Bangkok in 2008<sup>13</sup>. Although approximately 55–76% knew the cause of cervical cancer, only a few respondents possessed knowledge of HPV (10–26%). Nevertheless, the parents' attitude toward vaccines was overall positive. To date, researches focusing on young adults and the general population have been limited.

Few researches have recently reported the cost-effectiveness of the vaccination in order to support an implementation of HPV vaccine in a national vaccination program without any medical charges for young female adolescents who will obtain the maximum benefit from the vaccine<sup>14</sup>. In the meantime, when the vaccine has not yet been included in the program, the data about their knowledge, acceptance and the cost that the girls' guardians and the women whose ages are beyond the target group (but still have modest benefit) are willing to pay are important. The aim of this study was to evaluate knowledge, attitudes and the

cost that women residing in Bangkok Metropolitan are willing to pay for the HPV vaccination.

## Materials and Methods

The study obtained an approval from the Ethical Committees of the institution. This cross-sectional survey study was a parallel project of the studies evaluating the prevalence and associated factors of abnormal cytology and high risk HPV DNA among Bangkok metropolitan women conducted during September 2014 to the end of December 2014<sup>15</sup>, which involved the assessment of knowledge, attitude and behavior of Bangkok Metropolitan women towards cervical cancer screening<sup>16</sup>, HPV and self-sampled HPV testing<sup>17</sup>. This study focused on the knowledge and attitudes of women towards HPV vaccinations.

In brief, Thai women aged 25–65 years old who had lived in Bangkok for 5 years or over were invited to participate in the study. Convenience sampling was conducted to recruit women living in various districts in Bangkok. We excluded the women with a history of pre-invasive or invasive cervical lesions, other gynecologic cancer or who previously had HPV vaccination(s). All potential participants were informed about the purpose and contents of the study. The women who agreed to participate in the study signed consent forms prior to answering the questionnaires. The set of questionnaires used in this study was modified from our previous study, which investigated similar issues of HPV vaccination among Thai students<sup>13</sup>. Our previous questionnaire was constructed from both quantitative and qualitative studies<sup>18-19</sup>, validated in thirty mothers of

girls' children and validated again in thirty women before survey. The questionnaire was divided into three parts. The first part contained demographic data including sexual experienced (7 items), the second part involved knowledge about cervical cancer and HPV (9 items) and the third part was for this particular study as it involved the attitude and acceptability towards HPV vaccinations including the requirement of cervical cancer screening after vaccination (8 items). Each statement of the second and third parts had three options of answer (yes/no/don't know). The answer 'don't know' was considered to be incorrect. The multiple choice answers were intended to determine the cost that the women were willing to pay for the vaccine.

Data were analyzed using SPSS statistical software version 22.0 (IBM Corporation, Armonk, NY, USA). Descriptive statistics were used for demographic data, knowledge, attitudes and acceptance of HPV vaccine including the cost that the women were willing to pay for the vaccine.

## Results

A total of 5,000 questionnaires were distributed and 4405 women completed the questionnaires (response rate of 88.1%). Table 1 shows the baseline characteristics of the women. The median age was 47 years [interquartile range (IQR) of 25–65 years]. Most of the participants had sexual experience (90.6%), but only 63.2% were married. Almost all were Buddhist (95.5%). Nearly half (47.8%) had a bachelor degree and two-thirds (60.2%) of participants had a family monthly income more than 600 USD.

**Table 1:**

Characteristics of women participating in this study.

Data	N	%
<b>Marital status (n = 4,393)</b>		
Single	1077	25.5
Married	2778	63.2
Separated/divorced	538	12.3
<b>Age group (years) (n = 4,405)</b>		
21 – 30	302	6.8
31 – 40	963	21.9
41 – 50	1453	33.0
51 – 60	1342	30.5
61 – 65	345	7.8
Median (range)	47 (25–65)	
<b>Educational level (n = 4,389)</b>		
No education	56	1.3
Primary education	509	11.6
High school/Diploma	1202	27.4
Bachelor	2100	47.8
Master or higher	522	11.9
<b>Occupation (n = 4,375)</b>		
Unemployed	1049	24.0
Government sector/retirement	722	16.5
Employee	290	6.6
Private sector	989	22.6
Freelance	1325	30.3
<b>Income (USD) <sup>1</sup> (n = 4,405)</b>		
<600	1753	39.8
≥600	2652	60.2
<b>Religion (n = 4,376)</b>		
Buddhism	4179	95.5
Muslim	103	2.4
Others	94	2.1
<b>Had sexual experience (n = 4,375)</b>	<b>3963</b>	<b>90.6</b>

Remark: <sup>1</sup> USD approximated to 33 Baht.

Regarding the knowledge of cervical cancer, nearly two-thirds of the women knew the cause of cervical cancer (65.7%). Among the 9 related questions, multiple sexual partners (66.1%), sexually transmitted diseases (63.3) and HPV (58.5%) were answered correctly by more than half, which were 3 items focusing on etiology. For the knowledge of HPV and HPV vaccination, approximately two-thirds of the participants had heard about HPV (67.4%)

and the prevention of HPV infections (64.7%). Despite around half of them knowing that high risk HPV is the cause of cervical cancer (49.7%), only a few of them knew about the relationship between HPV and cervical cancer (2.8%) and knew different HPV types (6.2%). A quarter of the participants knew about the method of HPV transmission (25.6%), with the most frequently chosen answer being sexual intercourse (52.1%) (Table 2).

**Table 2:**

Knowledge of cervical cancer and HPV.

Questions on Knowledge towards Cervical Cancer and HPV	N	%
1. Knew cause of cervical cancer with correct response (n = 4339)	2,851	65.7
2. Cause of cervical cancer (n = 2851)		
- Multiple sexual partners	1,886	66.1
- Sexually transmitted disease	1,804	63.3
- Human Papilloma Virus (HPV)	1,668	58.5
- Poor genital hygiene/use of public toilets	1,236	43.4
- Viral infections	1,194	41.9
- Early sexual intercourse	1,103	38.7
- Non-barrier contraception	957	33.6
- Frequent sexual intercourse	890	31.2
- Stress	608	21.3
- Smoking	615	21.6
- Oral contraceptive pills	401	14.1
- Others	53	1.9
3. Heard about HPV (n = 4311)	2,907	67.4
4. Knew the relationship of HPV with cervical cancer (4190)	116	2.8
5. Knew about prevention of HPV (n = 2865) (sexual intercourse, HPV vaccination )	1,855	64.7
6. Knew types of HPV (n = 2894)	180	6.2
7. Low risk HPV causes Condyloma (n = 2875)	442	15.4
8. High risk HPV causes cervical cancer (n = 285)	1,425	49.7
9. Knew method of HPV transmission (n = 4085)	1,045	25.6
- Sexual intercourse	2,128	52.1
- Use of public toilets	490	12.0
- Blood transfusion	419	10.3
- Needle sharing	370	9.1
- Genetic	311	7.6
- Others	14	0.3

Among 4,300 women who responded to the question of attitude towards HPV vaccination, two-thirds of them had heard about the HPV vaccination (61.4%). Most of the 4,294 women accepted the HPV vaccine (78.6%). Nearly half (46.6%) learnt about the vaccination program from their health care provider. Slightly more than one-third of the participants knew which age group would benefit from the vaccine (34.6%). However, very few knew the type of HPV that the vaccine provides protection against (3.5%). Only a few of them knew the vaccine schedule, the cost of the

vaccine and how long the vaccine protection lasts (18.2% and 9.9%, respectively). Most were aware that a regular cervical Pap smear was still required after vaccination (90.5%) (Table 3).

The women aged 25–30 years old preferred a price range of 3,001–5,000 Thai baths (83.4–138.9 USD), which was higher than women aged 31–40 years old, 41–50 years old, 51–60 years old and 61–65 years old, respectively (Figure 1). A greater proportion of the women aged 25–40 years old accepted the vaccine (Figure 2).

Table 3:

Attitude of women towards HPV vaccination.

Questions on Attitude towards HPV Vaccination	N	%
1. Knew about HPV vaccination ( <i>n</i> = 4,300)	2,641	61.4
2. Source of information about HPV vaccination ( <i>n</i> = 2,542)		
- Healthcare provider	1,185	46.6
- Television/radio	1,004	39.5
- Newspapers/magazine	850	33.4
- Friends	761	29.9
- Internet	706	27.8
- Community's leaders	305	12.0
3. Knew which type of HPV the vaccine protects against ( <i>n</i> = 2,630)	156	3.5
4. Knew about schedule of HPV vaccination and cost ( <i>n</i> = 2,615)	477	18.2
5. Knew that vaccine is beneficial to which target group ( <i>n</i> = 2,625)	910	34.6
6. Knew how long the vaccine protection lasts ( <i>n</i> = 2,631)	261	9.9
7. Women need to regularly get a Pap test after vaccination ( <i>n</i> = 2,614)	2,365	90.5
8. HPV vaccination considered to be acceptable ( <i>n</i> = 4,294)	3,376	78.6

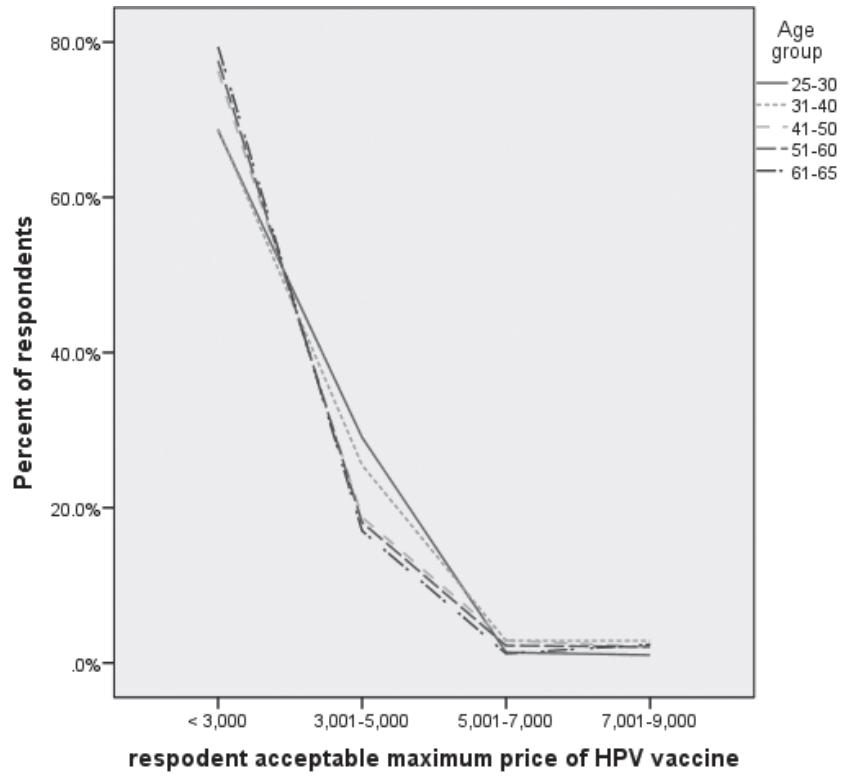


Figure 1: Expectation of the maximum price of HPV vaccine.

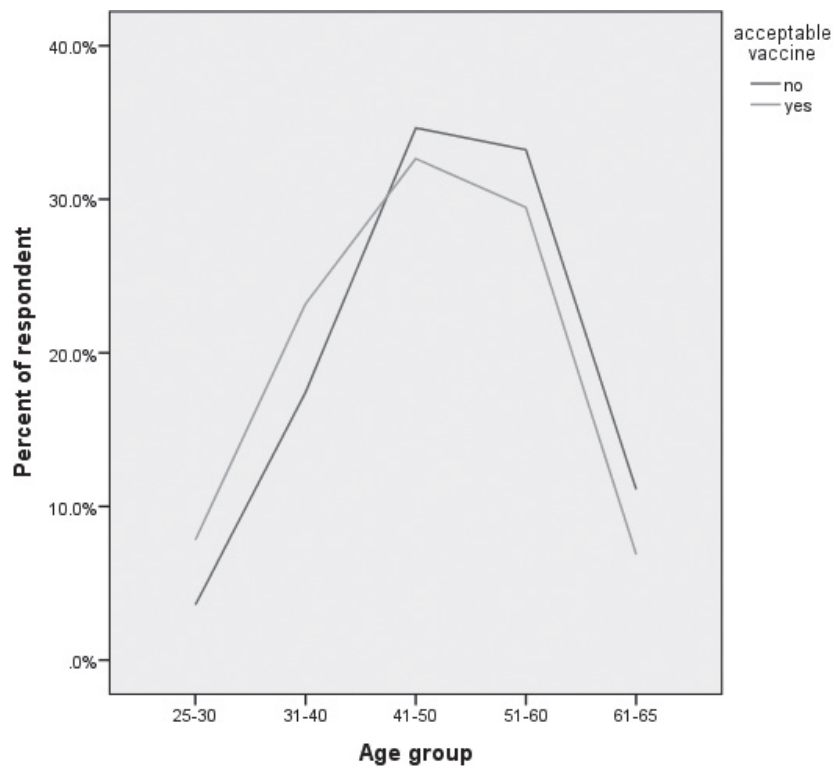


Figure 2: Characteristics of the groups that accepted and did not accept the HPV vaccine



## Discussion

This study was a parallel project with the cervical cancer screening project in Bangkok women<sup>15</sup>. We excluded women who should have better basic knowledge than others, including those with a history of pre-invasive or invasive cervical lesions, other gynecologic cancer or those who had received HPV vaccination(s). This study found that Bangkok women had a modest level of knowledge about the cause of cervical cancer (66%). This was consistent with the findings from previous studies, which reported that only 55% of the parents of school girls in Bangkok<sup>13</sup> and Malaysia<sup>10</sup> had knowledge on this subject. The level of education certainly has an impact on the level of knowledge. Studies showed that a higher percentage of students themselves who were in the active learning phase generally had knowledge about cervical cancer. For example, 82% of the college students in India had knowledge about cervical cancer<sup>20</sup> compared to 50.3–66.3% of the secondary school students in Malaysia<sup>21</sup>. However, education level may not be the only important factor because one study in university students in Hong Kong were found to have knowledge that varied from poor to good<sup>12</sup>.

Regarding the knowledge of HPV and HPV vaccination, our study found that only 2.8% knew of the relationship between HPV and cervical cancer, while there was poor knowledge of different HPV types (6.2%). Different findings were reported from India and Malaysia as almost half of the participants (42–52.8%) knew the relationship between HPV and cervical cancer, while a few of them knew about the different types of HPV (1–37.7%)<sup>20-21</sup>. The reason for this difference is that previous studies focused on young students, while our target population was older than 15 years. In terms of the knowledge of HPV vaccination, 61.4% of Bangkok women knew about the HPV vaccination in our current study. This was higher than the proportions

of 8% and 20% demonstrated in our previous study, which focused on the parents of school girls (public and private schools, respectively)<sup>13</sup>. This may be due to the launch of HPV vaccine in Thailand and recommendations by clinicians for almost 10 years, while our previous study was conducted after the vaccine was marketed for only one year.

Regarding the attitude towards HPV vaccine and their acceptability, the percentage of vaccine acceptability in women was higher than in Thai parents of school girls from public and private schools in our previous study (76% and 59.1%, respectively)<sup>13</sup>. The high proportion of HPV vaccine acceptability, reflecting the positive attitudes to vaccine, was similar to previous studies<sup>11,20</sup>. An increased amount of information related to HPV and cancer through various media has led to more acceptance and positive attitudes<sup>22</sup>.

About the price of HPV vaccine, two previous studies reported that the respondents required that the government should cover the cost of HPV vaccination in health care insurance<sup>11,13</sup>. Because the policy of inclusion of this vaccine into the program is underway and we were aware of the national health budget, we assessed the cost that women who may not be included as the target group in the national vaccination program because of a lesser benefit were willing to pay. We found the women who accepted the vaccination were willing to pay a higher cost (3001–5000 Thai baths; 90.9–151.5 USD) for the vaccine compared to the cost cited by the group that did not accept the vaccination (lower than 3000 Thai baths; <90.9 USD). The cost that women aged between 25–30 years old were willing to pay was higher than other groups. This may be due to their active work lives and their higher incomes, which makes this cost affordable. Nevertheless, the cost of HPV vaccine in Thailand was still higher than

the cost that all women in this study were willing to pay. Therefore, the HPV vaccination program should be fully or partially subsidized by the government in order to increase the coverage of HPV vaccination in the future.

Our study identified some problems that policy planning should focus on. Knowledge and attitudes towards cervical cancer especially caused by HPV, HPV vaccine could be improved by various strategies, e.g. health education, public relation or press conferences with mass media through celebrities/ambassadors or society volunteers to re-assure that those women understandable Health care providers should also routinely educate and promote screening and vaccination program when the patients come to hospital. In the meantime, public health providers should be proactive in educating people in the area. In Thailand where conservative culture is common, self-collected specimen for HPV testing may consider to be an alternative way.

In summary, the current situation of knowledge about cervical cancer and its vaccine has not greatly improved compared to the reports during the first few decades after the launch of HPV vaccination. With an inclusion of HPV vaccination into the national universal program for adolescent girls at certain age, this may raise the awareness of the parents and general population as well. Hence, more effort should be made e.g. commercial campaigns to generalize knowledge and acceptance of HPV vaccination to all Thai women especially the target group who are beyond the national vaccination coverage but still have benefit from HPV vaccine.

### Limitation

Our study plan to recruit women from different districts of Bangkok in order to represent Metropolitan women. Unfortunately, the electronic database had

incomplete number and information of registrants during the time frame, the questionnaires were distributed on hospital based instead. Hence, our results was not represented the distribution of women from each district.

### Conclusions

More than half of women living in Bangkok knew the cause of cervical cancer and HPV vaccine. Only a few knew about the relationship of HPV with cervical cancer and the different types of HPV. Although most women in the study have a positive attitude towards the HPV vaccine, the cost that they were willing to pay for the vaccine was lower than the current market price. These financial and marketing issues should be a national focus in order to increase the number of women who can afford the vaccination, which will ultimately decrease the rates of cervical cancer.

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