RESEARCH COMMUNICATION

Challenges to Cervical Cancer Screening in a Developing Country: The Case of Malaysia

Nor Hayati Othman[1]*, Matejka Rebolj[2]

Abstract:

Objectives: Many developing countries, including Malaysia, will need to continue relying on cervical screening because they will not be able to cover their entire female adolescent populations with HPV vaccination. The aim of this paper was to establish the extent of the health care, informational, financial and psychosocial barriers to cervical screening in Malaysia. Methods: A literature search was made for reports on implementation, perceptions and reception of cervical screening in Malaysia published between January 2000 and September 2008. Results: Despite offering Pap smears for free since 1995, only 47.3% of Malaysian women have been screened. Several factors may have contributed to this. No national call-recall system has been established. Women are informed about cervical screening primarily through mass media rather than being individually invited. Smears are free of charge if taken in public hospitals and clinics, but the waiting times are often long. The health care system is unequally dense, with rural states being underserved compared to their urban counterparts. If the screening coverage was to increase, a shortage of smear-readers would become increasingly apparent. Conclusions: Improving screening coverage will remain an important strategy for combating cervical cancer in Malaysia. The focus should be on the policy-making context, improving awareness and the screening infrastructure, and making the service better accessible to women.

Key words: Cervical cancer - screening - HPV vaccination - problems - Malaysia

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Introduction

Due to its high price, many countries including Malaysia will not be able to provide HPV vaccination for the entire adolescent population. Because screening will remain an important strategy to combat cervical cancer, every effort is needed to ensure that the investments made in screening are effective and efficient. While this is the case in every country, it is most pertinent in developing countries with limited resources for health care. Screening coverage is the most important determinant of screening effectiveness, yet in many countries it remains low (IARC, 2005).

Malaysia is a fast-developing South-East Asian country with a medium level of GDP per capita and a significant burden of cervical cancer. With the incidence rate of over 16 per 100,000, and the mortality rate of over 8 per 100,000, cervical cancer is the second most common female cancer (Ferlay et al., 2004; Lim et al., 2008). In 2008, 76% of all cases were diagnosed in FIGO stage 2 or higher (Othman et al., 2009).

Pap smear screening started in the 1960s but to this day, Malaysia has relied on opportunistic screening delivery and not an organized program. In 1995, the Ministry of Health launched the "Healthy Life Style Campaign against Cancer", an open invitation to women aged 20-65 years to have a Pap smear taken every 3 years for free (Mymoon and Majdah, 2007; www.gov.my). Since then, several awareness campaigns by the government and non-governmental agencies have taken place. The coverage has nevertheless remained low at 26% at the Second National Health and Morbidity Survey in 1996 and 47.3% at the Third National Health and Morbidity Survey in 2006. A large proportion of smears is taken during visits for antenatal or postnatal check-ups, it is concentrated among younger women (Othman, 2002). Among cervical cancer patients diagnosed in 8 major hospitals between 2000 and 2006, 48% reported never having had a Pap smear taken, whereas 95% did not have a smear within the past 3 years (Othman et al., 2009).

In earlier research, several types of barriers to screening, either perceived or objective, have been identified. Women fail to be screened due to insufficient resources, lack of knowledge, inability to access the health care delivery system, individual psycho-social and cultural contexts, fear, or limited family support and community participation (IARC, 2005).

The aim of this study was to summarize available evidence to determine the extent of the barriers to cervical screening in Malaysia. In line with previous research, we

*[1]Department of Pathology, University Sains Malaysia, Kubang Kerian, Kelantan, Malaysia,[2]Centre for Epidemiology and Screening, Institute of Public Health, University of Copenhagen, Copenhagen, Denmark,*For Correspondence: hayati@kb.usm.my*

Table 1. Cervical Cancer and Screening for Cervical Cancer in Malaysia, Its Neighboring Countries and in Selected European Countries.

	Malaysia	India	Indonesia	Philippines	Singapore	Thailand	VietNam	Denmark	Finland	The Netherlands	United Kingdom
Expenditure[1]	414	166	119	164	1,335	286	166	3,058	2,379	3,203	2,659
Population[2]	1,429	1,667	7,692	1,724	714	2,703	1,887	341	316	317	435
CxCa[3]	8.4	17.8	8.1	15.6	8.4	8.4	11.2	5.0	1.8	2.3	3.1
Rank[4]	2nd	1st	2nd	2nd	4th	1st	1st	7th	15th	11th	11th
Screening[5]	No	No	No	No	No	No	No	Yes	Yes	Yes	Yes
Cost[6]	Free	Rs 300 (US$) 27	Rp 250,000 27	P 400 7	S 15 9	Bt 256 7.5	VND 6,618 0.40	Free	Free	Free	Free
Coverage	26%[7]	5%[8]	NA	11%[9]	50%[10]	5%[11]67%[12]	7%[13]	68%[14]	71%[16]	77%[16]	79%[17]

[1]Health expenditure p.c. (US$),Yearly amount spent on health care, estimated as GDP per capita (purchasing power parity, 2005) x percentage of GDP spent on health (2003)(WHO, 2006);[2]Population per physician (HO, 2006; Watkins, 2007);[3]Cervical cancer mortality rate per 100,000 (WSR); [4]Rank of the level of incidence of cervical cancer compared to other female cancers in the same country (10); [5]National screening programme, whether individual invitations are sent; [6]Minimum cost per Pap smear in local currency (US$); NA = not available; [7] Women ever having a smear, http://www.nih.gov.my; [8]25-64 years, self-report of a smear within the last 3 years, 29% with a pelvic exam anytime during their lives, Gakidou et al., 2008; [9]25-64 years, self-report of a smear within the last 3 years; 35% with a pelvic exam anytime during their lives, Gakidou et al., 2008; [10]35-64 years, within the past 3 years, Yeoh et al., 2006; [11]Gaffikin et al., 2003; [12]Kritpetcharat et al., 2003; [13]25-64 years, self-report of a smear within the last 3 years, 80% with a pelvic exam anytime during their lives, Gakidou et al., 2008; [14]25-59 years, within the past 5 years. [15]30-60 years, within the past 5 years, http://www.cancerregistry.fi/jostats/eng/veng0037k2.html; [16]30-64 years, within the past 5 years, Rebolj et al., 2007; [17] 25-64 years, within the past 5 years, NHS Cervical Screening Programme, 2008

focused on the health care supply, provision of information regarding screening, costs for attending women, and psycho-social aspects.

Materials and Methods

We searched the Pubmed, Proquest, Ovid, EBSCO, Bibsys, Google Scholar, library catalogues, and Bioline International databases for available reports on implementation, perceptions and reception of cervical screening in Malaysia published between January 2000 and September 2008. We gathered technical reports in English or Malay from the Ministries of Health (MOH); Higher Education (MOHE); Women, Family and Community Development (MWFCD); Home Affairs and Transportation, and Government Units and Centres either by direct communication or, if published, on the official government portal (http://www.gov.my). We contacted the relevant ministries and private agencies by email and phone if documents of interest were not available on the internet.

Results

i) Health care supply

The average doctor to (total) population ratio in Malaysia is ca. 1:1,400 (Table 1), but it varies greatly by state (Table 2). Private hospitals and doctors tend to be concentrated in larger cities and towns. There is significant inequality between public and private health delivery service. The public sector hospitals, which are providing care for the majority (ca. 80-90%) of the population, are facing shortage of specialists, doctors, nurses, and technologists. Unlike in private hospitals, which have no or only short waiting times, the waiting time at public hospitals is usually very long. In one public university hospital 49% of patients waited 4-5 hours before being seen at the outpatient clinic (Hanafi, 2005).

Cervical screening is predominantly provided by the MOH, MWFCD, university hospitals (under MOHE), army (under Home Affairs) and private practitioners. While their services are overlapping, the communication among these providers is not seen. Pap smears are read by medical laboratory technologists (MLT). Training for cytoscreeners (smear-readers) takes 6 months after a completed 2-year general MLT program. Every year about 300 general MLT graduate and fewer than 1% continue to become cytoscreeners. In 2005, there were 2,885 MLT, of which only 113 trained cytoscreeners were working in public and private hospitals (Table 3). Only 84 were actively reading Pap smears, and out of these only about one quarter are certified by the International Academy of Cytology. Among the 87 histopathologists, the majority were working in public hospitals. Most also do cytopathology beside histopathology.

The ratio of cytoscreeners to histopathologists per yearly number of smears read is ca. 1:3,200 (Table 3) which still, though to a varying degree by type of venue, broadly falls within the international quality assurance standards. With ca. 7 million women aged 20-69 years in 2005 (WHO/ICO Information Centre on HPV and Cervical Cancer, 2007), the ratio of active smear readers would have been ca. 1:11,700 if all eligible women had 1 smear taken per 3 years. In this case, Malaysia would need more than 250 extra smear-readers in order not to exceed at most about 5,000 smears read by 1 smear-reader per year.

ii) Provision of information regarding screening

Women are not individually invited to screening. Instead, several awareness campaigns have been carried out either by the MOH (Cheah and Looi , 1999; Lim, 2002; 2006) or by non-profit organizations such as the Malaysian Medical Association and the National Cancer Council. Open invitations and flyers advising to undergo a free Pap smear between the ages of 20 and 65 at a 3-year screening interval are posted on walls in all government clinics and hospitals, and in other public places, e.g. supermarkets, cinemas and city halls. Campaigns are also regularly aired on the government-

Table 2. Distribution of Urban* Centres, and Access to Health Care by State (http://www.gov.my)

State	Area km^2	Urban status	Female Population[1]	Private[+] Hospitals[2]	Public Hospitals[2]	Public Doctors[3]	Public Doctor:Patient[4]	Average Size[5]
Johore	18,986	Yes	858	213	20	1,295	1:662	949
Kedah	9,426	No	507	120	21	822	1:617	449
Kelantan	14,920	No	365	23	19	1,012	1:360	79
Melaka	1,651	Yes	197	45	6	465	1:425	275
Negeri Sembilan	6,643	No	260	72	13	710	1:366	511
Pahang	35,965	No	376	38	20	634	1:594	1,798
Trengganu	12,955	No	256	22	13	497	1:514	997
Perak	21,005	Yes	622	190	24	1,244	1:500	875
Perlis	795	No	63	12	2	147	1:472	398
Pulau Pinang	1,030	Yes	462	157	13	941	1:491	79
Selangor	7,955	Yes	1,397	451	22	2,079	1:672	362
Sarawak	124,449	No	630	47	42	797	1:790	2,963
Sabah+FT Labuan	73,712	No[#]	802	65	49	894	1:897	1,504
FT Kuala Lumpur	243	Yes[#]	469	366	2	2761	1:170	122
FT Putrajaya	49	Yes[#]	22,500	0	2	NA	NA	25

*Minimum number of population per gazzeted area of 10,000; [+]As listed in Telekom Malaysia Yellow Pages for 2007 only (official data not available); [1]20-65 years (x1,000); [2]hospitals and clinics; [3]sector doctors; [4]sector doctor to female patient (20-65 y) ratio; [5] size of public hospital catchment area (km^2); FT=Federal Territory; [#]Due to its acreage

Table 3. Pap Smear Services in Malaysia (after Faizol et al., 2005; Jayaram and Yahya, 2002)

Venue	No of MLT who are cyto-screeners	No of Histopathologists reading Pap smears	No of Pap smears read per year	Cytoscreeners and histopathologists per smear
University Malaya Medical Center	6	2	9,000	1: 1,125
Hospital University Kebangsaan Malaysia	5	2	3,500	1: 500
Hospital University Sains Malaysia	1	5	1,500	1: 250
MOH hospitals	84	66	396,573	1: 2,644
MWFCD[+]	5	0	19,358	1: 3,872
Army hospital	2	2	100#	1: 25
Private laboratories	9	10	210,000	1:11,053
Non-Governmental organizations	1	0	5,000#	1: 5,000
Total	113	87	645,031	1: 3,225

MLT=Medical laboratory technologists; [+]Through National Population and Family Development Board (LPPKN), offering family planning and reproductive health services mainly to married couples; #Estimated

owned radio and television stations. Notwithstanding, a large majority (96%) of patients reported not knowing the recommended screening interval (Othman et al., 2009).

iii) Costs for attending women

Pap smears are provided free of charge in the public health care setting, whereas the fee ranges from RM 15 to RM 25 ($4.4 to $7.4) in private health care. The average monthly income for women is RM 500 ($125).

The transportation system in Malaysia is good, predominantly inexpensive and comparable to those in developed countries. Most Malaysians can easily access any health care provider by land. 96% of the population is easily accessible by paved land roads, the remainder by railway and air transport.

iv) Psycho-social aspects

Malaysian women receive equal educational opportunities as men. Primary schooling is mandatory from age 7 to 12, and government-assisted schools provide free education until age 18. In 2001, 95% of girls attended primary school, and 74% continued at secondary level. In 2005, 60% of women were participating in the Malaysian labour force, primarily as sale workers and clerks, 27% were housewives, 11% were attending school (http://www.gov.my). The unemployment among women has been below 4%, and there are fewer than 3% who are hardcore poor (http://www.gov.my). 80-85% of their husbands participate in labour force, primarily as skilled workers, plant and machine operators and in craft and related trade, with an average monthly income of RM 1,500. The Malaysian National Health and Morbidity Survey showed that the uptake of screening was particularly low among uneducated and low-income women (http://www.nih.gov.my). Despite a generally good level of education among women, 23% of cervical cancer patients surveyed in 2007 had none, and 38% had only primary school education. Among these patients, 36% were not familiar with the test, 13% were afraid of taking it, 10% felt shy, and 3% did not have it taken because they could not find a female doctor (Othman et al., 2009).

Women have on average 3 to 4 children. Particularly for women living in rural areas, extended family members play a role in decision-making including household economics and seeking treatment. Their role, however, decreases with an increasing grade of urbanization. Especially women living in remote villages tend to consider removing parts of the body tissue, e.g. through a Pap smear, a taboo (Anonymous, 1997). Many Malaysians continue using traditional health care despite a modern rural health service (Ariff and Beng, 2006).

Discussion

Increased screening coverage rates through improved awareness of the disease and its prevention are important determinants of reducing the burden of cervical cancer in Malaysia. There seem to be several factors that have played a role in why, despite offering Pap smear screening free of charge, the coverage rate remains as low as 47%. Rather than being invited individually, women are informed about cervical screening primarily through mass media, and, as a recent study suggested, are not always recommended by their health-care provider to have a Pap smear taken (Wong et al., 2009). A variety of governmental and private providers offer the smears, but at present these do not have adequate human capacities to cover a substantially larger proportion of women. Smears are in principle free of charge for women if taken in a public hospital or clinic, but then women need to be prepared to endure long waiting times.

In Malaysia, cervical screening is implemented by several governmental and non-governmental institutions, with little communication among these. Indeed, a policy-making context lacking coordinated action was identified as a barrier to an evidence-based and coherent change in cervical screening. Changing the policy-making context has been identified as necessary also elsewhere in the South-East Asian region (Ngelangel et al., 2003; Suba et al., 2006).

The issue of public vs. private health service is problematic in Malaysia, and has been intensely debated at the governmental level. While only 10 to 20% of people can afford health care from a private provider, an overall larger proportion of all health care personnel work in this sector. In general, one has to be prepared to wait long hours in public hospitals and clinics, which could be a strong barrier for women with respect to attending cervical screening. Women, even employed professionals, are the nuclei in any household in Malaysia, responsible for running the households, raising and nurturing children, and taking care of other family members. Having to wait for a smear for several hours is not an appealing option to most. In this respect, self-sampling tests could help increase the uptake rates of cervical screening also in Malaysia.

There are at present about 7 million women aged 20-69 years, and 200 active smear-readers. If the coverage rate would increase substantially, Malaysia would need to at least double the present number of smear-readers in order not to increase the load per smear-reader. Given the current rate of educating these professionals, this may pose a problem. In this case, automation-assisted smear reading could be considered as a possible solution.

About one half of the cervical cancer patients have attained only up to primary level of education (Othman et a., 2009), which suggests that these may be the high-risk women. Moreover, Malaysia, with its booming economy and surrounded largely by poorer nations, attracts high numbers of legal and illegal immigrants who, unlike Malaysian women, had lower or no education. Immigrants, legal or otherwise, nevertheless can seek treatment in government hospitals, but due to their illegal status, many opt not to until the illness is advanced.

The relatively high attained educational level of Malaysian women should in principle facilitate the uptake of cervical screening. Nevertheless, even among relatively well-educated women the potential knowledge is not often executed in practice. For example, in a study among factory workers in Malaysia, the majority of whom had secondary education, only 25% ever had a Pap smear taken (Chee et al., 2003) Among predominantly highly educated women working at the university, 28% had a smear taken within the previous 3 years (Shamsuddin and Zailiza, 2001). Some 63% of women with cervical cancer were familiar with the concept of a Pap smear, however the majority did not act on that knowledge (Othman et a., 2009). Educated health professionals in Thailand, for example, cited as the reasons for not having undergone a Pap smear that they could not fit it in their busy schedules, embarrassment, and feeling healthy (Chumworathayi and Chumworathayi, 2007). For employed urban Thai women, perceived barriers were a stronger predictor of (non-)attendance to screening than perceived individual susceptibility to cancer and perceived benefits from screening (Boonpongmanee and Jittanoon, 2007). Being busy, experiencing shame and feeling healthy were also commonly reported reasons for not having attended screening in other neighboring countries, alongside the high cost, fear, fatalism, long waiting times, and the unavailability of a female doctor (Seow et al., 1995; Straughan and Seow, 1998; Ngelangel and Wang, 2002; Basu et al., 2006; Boonpongmanee and Jittanoon, 2007). In Singapore, women irregularly attending screening identified the following strategies that would help them overcome the barriers: more convenient smear-taking locations, free smears, female smear-takers, more information, and an invitation letter (Lee et al., 2002).

The burden of cervical cancer in Malaysia and its neighboring countries, Singapore, Thailand, Indonesia, Vietnam, Philippines and India is high (Table 1). These countries except for Singapore do not offer organized screening programs, the doctor-to-population ratios are generally high, while the health expenditure per capita is low. The coverage rates of screening for cervical cancer remain far below those seen in developed European countries, in which organized screening programs with effective invitational systems have existed for decades (Table 1).

An effective and efficient cervical screening program requires a good screening infrastructure: an adequate invitational system, agreed-upon screening and referral guidelines, adequate capacities and financing, as well as continuous monitoring of primary screening and follow-up of screen-detected abnormalities. In South-East Asia the cancer screening programs may have to, even more so than in developed countries where the health expenditure per capita is typically several times higher, compete with other urgent health needs. Malaysia and its neighboring countries have recognized the need for secondary prevention of cervical cancer by offering various preventive services (e.g. Pap smears, visual inspection with acetic acid) in an opportunistic setting. While opportunistic screening may offer some degree of protection, it tends however to

be less effective and efficient than a well-implemented organized program (IARC, 2000). The recent initiatives at providing screening within organized programs (Mymoon and Majdah, 2007; Domingo et al., 2008) are therefore welcome.

In two districts of Johore and Selangor states in Malaysia, a pilot cervical screening project was initiated in 2006 (Mymoon and Majdah, 2007). This pilot project shares the characteristics of the programs currently implemented in several developed European countries in that it created a call-recall system based on a population registry and a Pap smear registry. It addressed quality assurance for participating laboratories and other screening service providers, developed uniform guidelines, and relies on monitoring and evaluation. The first results of the impact of this pilot project are expected in 2009/2010 (Mymoon and Majdah, 2007).

In conclusion, HPV vaccination has not been widely implemented within the Malaysian childhood vaccination program. In a country where the rates of premarital sexual intercourse seem to be increasing (Lee et al., 2006), improving the screening coverage will therefore remain a crucial strategy of combating cervical cancer. As our overview has shown, Malaysia should focus on the policy-making context, improving awareness, screening infrastructure, e.g. the availability of the necessary number of smear-readers, and making the service more woman-friendly by cutting down the waiting times.

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