

Survey article

Cervical cancer prevention training in South East Asian LMICs

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ABSTRACT

The Association of Southeast Asian Nations (ASEAN) is a confederation of 10 sovereign states occupying approximately 1.7 million square miles of Southeast Asia with an estimated population of just under 630 million. South-east Asia continues to have one of the world's highest rates of cervical cancer-related death.

Organised training in cervical cancer screening is essential but lacking in low to middle income countries (LMICs). Systematic training of local doctors is an essential part of an effective screening program and an effective strategy to reduce cervical cancer-related mortality.

Singapore is a first-world economy with a healthcare system that can support this mode of training and is geographically proximate to Southeast Asian LMICs that need this training. This makes it possible for model of tiered training with trainers on site in the LMICs and more advanced training where trainees receive training in Singapore. We present a case study where this tiered system of training is applied to Cambodia and demonstrate that this model of training is not only effective but also sustainable.

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1. Introduction

The Association of Southeast Asian Nations (ASEAN) is a confederation of 10 sovereign states occupying approximately 1.7 million square miles of Southeast Asia with an estimated population of just under 630 million (<https://www.usasean.org/why-asean/what-is-asean>). While there are first world economies like Singapore that are part of this confederation, Southeast Asia continues to have one of the world's highest rates of cervical cancer-related death. Cambodia with a population of 16 million has a reported annual cervical cancer incidence of 27.4 per 100,000 and an annual cervical cancer mortality of 16.2 per 100,000. Myanmar with population of 54 million has a reported annual cervical cancer incidence of 26.4 per 100,000 and an annual cervical cancer mortality of 15 per 100,000. Lao People's Democratic Republic (PDR) has a population of 6.8 million and has a reported annual cervical cancer incidence of 22.1 per 100,000 and an annual cervical cancer mortality of 13.3 per 100,000 (<http://globalcancermmap.com>). While many of these Southeast Asian countries still fall within the established economic definition of low-middle income countries (LMICs), they are also emerging economies which will likely see significant development in the coming decade with increased urbanization and more importantly increased government spending on infrastructure development (<http://www.worldbank.org/en/region/eap/overview#1>). The primary drivers of growth in these countries is relative political stability and governments that are committed to joining the global economy and therefore

actively rolling back decades of isolationism (<https://www.cia.gov/library/publications/the-world-factbook/geos/la.html>; <https://www.cia.gov/library/publications/the-world-factbook/geos/bm.html>; <https://www.cia.gov/library/publications/the-world-factbook/geos/vm.html>). This presents a unique opportunity for women's healthcare to leap forward if infrastructural changes, training and NGO funding are introduced in a culturally-sensitive and politically-astute program of progressive engagement.

2. Objectives and the modus of knowledge transfer

The model which has been shown to be effective in Southeast Asia has been one based on the projection of expertise into the healthcare environment of target LMICs through the systematic and progressive education of primary general health care providers in the use of low-impact modalities such as cryotherapy, cold coagulation and visual inspection with acetic acid (VIA). VIA has been shown to be both clinically effective and acceptable to women in low-resource settings ([Selmouni et al., 2015](#); [Gessesse et al., 2015](#); [Deksissa et al., 2015](#)). The key to growing such programs successfully is early recognition that the rate at which information transfer occurs has to be actively modulated and even severely restricted in some cases to ensure that only very rudimentary steps are taken at first. For example, the use of VIA in see-and-treat versus traditional colposcopically-directed biopsy and histological diagnosis, where VIA requires less training, is more easily generalizable and results in better patient access. The principle of "some small steps are better than one big step followed by no steps" has worked well for us in Southeast Asia. Finally, cultural inertia is a real entity and should not be ignored by any program whose intent it is to effect durable change.

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3. Working with the governments of Southeast Asian LMICs

It is important to understand that the governmental structure, especially the civil service is a lot more stable and dictates infrastructure more durably than in the West. The civil service is often not as subject to the whims of an elected presidency or premiership and so has less volatility and less prone to change than an apparently democratically elected presidency or premiership. Changes to the infrastructure will take time, but when changed gradually are unlikely to be changeable. This suggests that forward planning and with a 5, 10 and 20 year plan in place that can be tweaked to accommodate changes in leadership temperament is often a good idea. It is also important in Southeast Asia to respect the concept of *guan xi* (Mandarin for relationship). This roughly translates into developing durable rapport with those in decision-making capacities, and given the relatively unchanging nature of leadership in many LMICs where cervical cancer prevention programs are most needed, this policy of aligning the program with the overall political objectives of leadership makes good sense.

Finally, as societies in Southeast Asian LMICs become more open, the improvement of the overall health of the citizenry also becomes potent political capital to policy and lawmakers. This vested interest should also be taken into account when building cervical cancer prevention programs.

A case report of colposcopy training in Cambodia follows to highlight some of the concepts and challenges outlined above in introducing cervical cancer prevention programs in Southeast Asian LMICs.

4. Formation of collaboration with Cambodia

The Division of Gynecologic Oncology, Department of Obstetrics and Gynecology of the National University Hospital (NUH) in Singapore (henceforth referred to as “the Division”) has an established track record of teaching and training in Singapore and the region in basic and advanced colposcopy and the treatment of preinvasive cervical disease. NUH is an ideal training site because of Singapore’s strategic location and training facilities such as the Advanced Surgical Training Centre (ASTC) which is equipped with 6 fully-equipped operating bays able to support live animal lab work and a lecture hall equipped with 3D projection. The ASTC also features a full range of connectivity options to support video-conferencing and transmission and broadcasting.

The creation of the colposcopy training simulator platform through collaboration between the Gynaecology Oncology Division and the National University Hospital (NUS) School of Design, Division of Industrial Design has enhanced the quality of colposcopy training delivering realism and verisimilitude of the vaginal and cervical environment both in texture, space and usability with energy devices. The model is particularly useful as it is highly portable and has been used in off-site training in low resource settings with great success.

Through outreach efforts and in training doctors from neighboring low-middle income countries (LMICs), the Division has become aware of the urgent need for basic training in cervical cancer screening and prevention in Southeast Asia. Access to adequate training facilities, consistent instruction and resource-appropriate treatment and screening recommendations remain the primary challenges in getting more health care providers training in the early detection, screening and prevention of cervical cancer. The Division has consistently sponsored training for doctors from regional LMICs as part of a coordinated and long-term outreach initiative to improve women’s healthcare in Southeast Asia. This sponsorship begins with travel, accommodations and registration to attend the annual colposcopy training program of the workshop at NUH. This has helped to establish useful connections with women’s healthcare professionals and an ad hoc network in Southeast Asia.

Cambodia was one of the Southeast Asian LMICs identified for outreach with a suitable candidate “point person” for sponsorship. Dr.

Sovannara Thay Nara was identified as the first Cambodian candidate to receive sponsorship. Dr. Thay is a women’s healthcare physician who manages and runs 2 facilities in Cambodia involved in women healthcare; The Women’s Health Clinic at Sihanouk Hospital Centre of HOPE (SHCH). Dr. Thay works very closely with the Ministry of Health (MOH) in Cambodia, especially in establishing a cervical cancer screening program in Cambodia. The Division provided sponsorship for Dr. Nara to attend the advanced colposcopy course and also hosted her for a week during which she was able to observe and make contact with the nursing and operations teams supporting cancer screening and colposcopy services at NUH and NCIS. This program was created to allow providers and administrators from LMICs an idea of how these services are organized and how patients access these services in a sustainable and reproducible fashion.

5. Establishing a tailored colposcopy program

Following her time with us in the Division, Dr. Thay reported back to the Ministry of Health (MOH) in Cambodia and secured funding for the first basic colposcopy course to be held in Cambodia at SHCH. The timing of this course was fortuitous and coincided with the Cambodian government’s announcement of the establishment of a national cervical cancer screening program employing visual inspection with acetic acid (VIA) and treatment with cryotherapy. This announcement dovetailed perfectly with our plans to support cervical cancer prevention in Cambodia through training and education.

Following discussions between NUH and SHCH, the components of the first basic colposcopy program were formalized and included:

1. Training of doctors working in hospitals in Phnom Penh, non-governmental organizations (NGO) and Cambodian provinces.
2. Scheduled as a one-day program consisting of lectures and theory presentations in the morning session to be followed by a practical session in the afternoon. The workshop was ultimately carried out over two days to accommodate all the doctors due to overwhelming interest in the program.
3. Lectures on the use of the colposcope, basic cervical anatomy, colposcopic features and the diagnosis of preinvasive cervical disease, VIA and cryotherapy.
4. A hands-on practical session where participants were taken through the use of the colposcope and colposcopy, and treatment with cryotherapy and LEEP (loop electrosurgical excision procedure) using our simulated vaginal and cervical platform. The program is as seen in Table 1.

6. Implementation of Cambodia’s basic colposcopy training workshop

The NUH team consisted of 4 members from the gynaecology oncology division:

- Dr. Ida Ismail-Pratt, Consultant gynaecologist and lead colposcopist, NUH
- Dr. Ng Kai Lyn, OBGyn Senior Resident, NUH
- Sister Joyce ER, Gyn Oncology Advanced Practice, NCIS
- Ms. Blyss Kwong, assistant manager and program co-coordinator, Division of Gyn Oncology, NUH.

The Cambodian team consisted of:

- Dr. Sovannara Thay, training program lead
- Mr. Souk Buoy, training program director and co-ordinator
- Dr. Manna, junior gynaecologist at SHCH
- Dr. Yuhin, research fellow in gynaecology in SHCH.

The workshop was planned for 40 doctors from SHCH, private and public hospitals in Phnom Penh, NGOs and the provinces. The plan included running the same workshop in 2 locations over 2 days:

Table 1

The outline of the first basic colposcopy workshop program in SHCH.

Day 1: Attended by doctors from the Cambodian provinces

Time	Duration	Program:
Morning – Theory Session		
7.30am – 8.00am	30mins	Registration
8.00am – 8.40am	40mins	Opening address 1. Dr CHHUN Loun, Vice Chief of Non Communicable disease office, MOH Cambodia 2. Dr THAI Sopheak, Director of Sihanouk Hospital Centre of HOPE
8.40am – 8.45am	15mins	Group Photo
8.45am – 9.00am	15mins	Tea Break
9.00am – 9.30am	30mins	Theory 1: Colposcopy and the Abnormal Cervix by Dr. Ida Ismail-Pratt
9.30am – 10.00am	30mins	Theory 2: LEEP Procedure and demonstration by Dr Ida Ismail-Pratt
10.00am – 10.30am	30mins	Theory 3: VIA and cryotherapy by Dr. Ng kai Lyn
10.30am – 10.50am	20mins	HPV Vaccine by KONG Sokhak, product manager Pharma Company
10.50am – 11.20am	30mins	Questions & Answers
11.20am – 12.20pm	60mins	Lunch
Afternoon – Practical Session		
12.30pm – 4.30pm	4 hours	Training Simulator using porcine tissue • Colposcopy and LEEP • Cryotherapy
4.30pm – 4.45pm	15mins	Presentation of Certificate and group phototaking

Day 2: Attended by doctors from Cambodian city hospitals and NGOs

Time	Duration	Program
Morning – Theory Session		
8.00am – 8.30am	30mins	Registration
8.30am – 9.00am	30 min	Breakfast
9.00am – 9.30am	30mins	Theory 1: Colposcopy and the Abnormal Cervix by Dr. Ida Ismail-Pratt
9.30am – 10.00am	30mins	Theory 2: LEEP Procedure and demonstration by Dr Ida Ismail-Pratt
10.00am – 10.30am	30mins	Theory 3: VIA and cryotherapy by Dr. Ng kai Lyn
10.30am – 10.50am	20mins	HPV Vaccine by KONG Sokhak, product manager, Pharma Company
10.50am – 11.20am	30mins	Questions & Answers
11.20am – 12.20pm	60mins	Lunch
Afternoon – Practical Session		
12.30pm – 4.30pm	4 hours	Training Simulator using porcine tissue • Colposcopy and LEEP • Cryotherapy
4.30pm – 4.45pm	15mins	Presentation of Certificate and group phototaking

- Sihanouk Hospital Centre of Hope (SHCH)
- Embassy Medical Centre (EMC)

This was because there was only sufficient equipment to support 20 participants per day. Each hospital only had 1 colposcope, 1 diathermy generator, 1 smoke evacuator and 1 cryotherapy machine. On the day, it was found that only 1 cryotherapy machine was working. It was then decided that both theory and practical sessions were going to be held in SHCH.

7. Lessons learnt from pilot program

7.1. Challenges in infrastructure for training

The SHCH has an auditorium that can accommodate up to 100 people comfortably. The auditorium is air-conditioned and supports PowerPoint projection. This was thought to be an ideal location for the entire course. However, the auditorium is on the fourth floor with no lift. This made moving the equipment needed for the practical session,

colposcopes, cryotherapy gas cylinders, diathermy generators and smoke evacuators to the auditorium prohibitive.

So while the auditorium was big and comfortable enough, equipment could not easily be moved up to it. This meant that practical sessions had to be held at the Women's Health Centre of SHCH. The Women's Health Centre is a small two-room clinic with a consultation room and a procedure room to perform colposcopy and treatment on a daily basis. While adequately equipped, it was too small to accommodate all the participants for the practical session of the workshop. The team worked overnight to modify the consultation room to be the colposcopy/LEEP workshop station and the procedure room to be the Cryotherapy treatment workshop station.

On the day of the workshop, only 1 colposcope and 1 cryotherapy machine were found to be working and available for training. The colposcope was used in day to day clinics and during the workshop, due to prolonged use, the lamp burnt out twice. This being the weekend, there was no maintenance team and with no access to maintenance equipment and parts. The team improvised by using the lights on their iPhones and taping these phones to the colposcopes.

The primary learning points are as follows:

- Early “walking of the ground” is needed. The facilities need to be physically checked for suitability and equipment needs to be checked for functionality. Arriving an entire day early or on a weekday when the full complement of staff is available is important.
- Backup equipment when available is good to have. Arrangements for this equipment to be airlifted or borrowed need to be made. All this equipment will then have to be checked for functionality again on site once it arrives.
- Support personnel familiar with the physical layout and function of the training facility and with access to parts and equipment should be present or at least available during the training program.

7.2. Theory sessions

Language was a major but not insurmountable obstacle to training. This was more obvious on Day 1 with the provincial doctors who spoke very little English. There were translators for both days, but communication remained difficult.

It was clear that a good majority of the doctors attending the course especially those from provincial areas had no basic training in colposcopy or cervical cancer screening and prevention. The theory session was kept basic and was well received by all participants. All doctors were experienced in VIA but it was unclear how much training each of them had received prior to this course. A small number of doctors had done colposcopy and LEEP, with most of these doctors being from the city hospitals and NGOs. Few doctors from the provinces had ever done colposcopy or LEEP.

The primary learning points are as follows:

- Language is not an insignificant issue when training in Cambodia. Few doctors have sufficient fluency in English to be able to understand complicated instructions or sophisticated lectures. Lectures should outline simple concepts in clear declarative sentences. Instructions should be given in steps and in simple sentences. Finally, there should be enough translation support for a workshop-type setting where there may be multiple stations. One translator per station where the instructor does not have fluency in Khmer.
- Training, experience and skill may vary quite widely amongst participants. The overall level of training in Cambodia for colposcopy and cervical cancer prevention should still be pitched at teaching basic skill sets to frontline providers. Practitioners with more advanced skill sets may be candidates for sponsorship for further training in NUH and to attend the Advanced Colposcopy Course.

7.3. Practical sessions

In the course of the training program, it became apparent that some of the participants especially practitioners from the provinces had never been taught how to handle a colposcope and an ad hoc session was established to introduce some of these physicians to the colposcope, its proper handling and functions.

The colposcopy simulator (Fig. 1) was well received by the participants. All the participants were able to experience a more realistic training environment for colposcopy, LEEP and cryotherapy through the use of the colposcopy simulator which not only replicates the confines of the vagina, but the actual feel and tension of vaginal tissue. Finally, the simulator provides a platform on which real time electrosurgical procedures such as ablation and diathermic excision may be performed. The colposcopy simulator was identified as an essential tool for future training and outreach programs in LMICs (Figs. 2 and 3).

It was realized that a LEEP station may not be an important component of future workshops since most participants do not have the facilities for the procedure in their region. This was more so for the physicians from the provinces. During the course of the training, it also became clear to many of the participants for the workshop that the LEEP station provided an introduction to the procedure and that

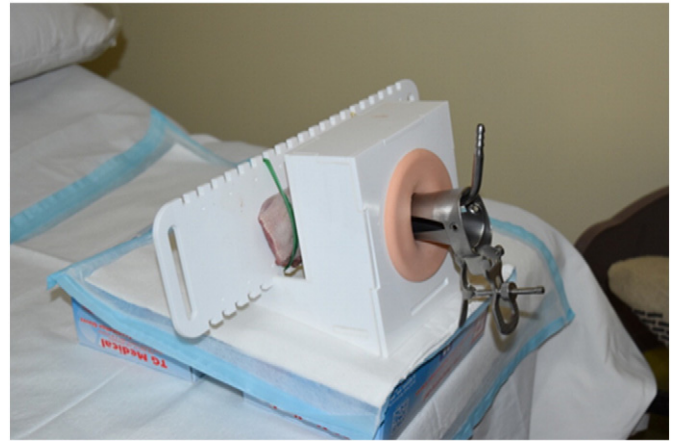


Fig. 1. Colposcopy simulator.

more training and guidance in the procedure would be necessary before they could safely provide this service to their patients. This led to quite a bit of interest and quite a few requests to come to NUH to train at the Advanced Colposcopy Course.

8. Participants' responses

All the participants showed keen interest in both the theoretical and the practical content of the workshop with some of them traveling from distant provinces to attend the workshop held in Phnom Penh. As outlined earlier, the limited space in the Women's Health Center meant that only a single participant and one instructor could be at a practical station at any one time. This made for long waiting times for the rest of the participants who patiently waited their turn outside. The wait outside for some was up to three hours. These Cambodian doctors' desire to learn was overwhelmingly refreshing and inspired the team from NUH to return for future programs with more equipment and more instructors.

While most of the participants had performed cryotherapy before the workshop and were familiar with the instruments used at the workshop, the team found by polling the participants that there was a wide variation in the indication, conduct of treatment and degree of follow-up amongst the participants. The common thread was that few if any of them had had any structured training or assessments and were never given feedback on their performance and had no infrastructure through which their practices could be audited. The team reviewed IARC (International Agency for Research on Cancer) recommendations

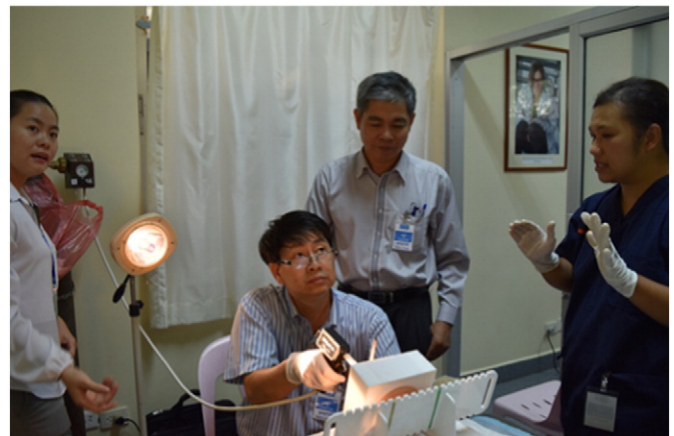


Fig. 2. Cryotherapy training session.



Fig. 3. Colposcopy and LEEP training station.

and guidelines with the participants at this course. Overall, the cryotherapy component of the workshop was very well received.

9. Future collaborations and opportunities

The first colposcopy workshop in Cambodia as part of the Division's outreach program was an essential first step, a vital pilot program in establishing durable infrastructure for training in cervical cancer prevention and the treatment of preinvasive disease of cervix in Cambodia. The overall philosophy is to establish infrastructure that will enable Cambodian doctors to be equipped with the necessary skill sets to be able to train frontline care providers such as village nurses, midwives and care providers to be able to do provide VIA screening. "Training the Trainers" type workshops will also help build a cadre of Cambodian trainers in basic colposcopy who will augment not only the capability of visiting trainers, but also the number of doctors that can be reached and trained at any one workshop. The NUH team has set about identifying potential candidates for just such a program.

Local trainers have the advantage of not having a language barrier, being aware of the specific clinical needs of each provincial region and therefore tailor the training to fit the needs of the women that these doctors serve in a resource-appropriate fashion. It will also be more sustainable to have a national training program run by local trainers. More workshops can also be carried out each year without the cost and administration of having foreign trainers each time.

The workshop has also increased awareness amongst other hospitals and healthcare institutions to the importance of effective training in

basic colposcopy and cervical cancer screening and prevention and the value of collaborating with a partner like NUH to develop sustainable infrastructure in Cambodia to deliver this care. The Division received numerous training requests and requests for sponsorship after this workshop. The groundwork is being laid for future collaboration between the Division and these potential partners in Cambodia.

Another avenue for outreach is a fellowship program in Cervical Cancer Screening, Early Detection and Prevention. The resources for just such a program already exist at NUH. Such a program would allow Cambodian doctors to not only to gain further knowledge and experience but also facilitate knowledge transfer to help build the national infrastructure to not only deliver this care but also track outcomes and improve sustainability and clinical effectiveness.

10. Conclusion

The first outreach program highlighted the need and high demand for training in colposcopy and treatment in a neighboring Southeast Asian LMIC. Training should cater to the needs of individual countries and take into account the experience of the doctors attending training, infrastructural challenges and local resources available. The colposcopy training simulator is an essential part of training being a portable platform that is able to provide a reproducible and realistic training experience. Training local trainers to run their own programs is a viable strategy to create a sustainable national training program that will result in significantly improving the health of women in Cambodia.

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