



Variations in gynecologic oncology training in low (LIC) and middle income (MIC) countries (LMICs): Common efforts and challenges



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ARTICLE INFO

Article history:

Received 5 October 2016

Received in revised form 29 December 2016

Accepted 4 January 2017

Available online 9 January 2017

Keywords:

LMICs

Gynecologic: Oncology

Training

ABSTRACT

Gynecologic cancer, cervical cancer in particular, is disproportionately represented in the developing world where mortality is also high. Screening programs, increased availability of chemotherapy, and an awareness of HIV-related cancers have in part accelerated a need for physicians who can treat these cancers, yet the infrastructure for such training is often lacking. In this paper, we address the variations in gynecology oncology training in LMICs as well as the ubiquitous challenges, in an effort to guide future agendas.

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1. Introduction

It is well established that outcomes of gynecologic cancer patients are better when treated by appropriately trained subspecialist gynecologic oncologists (Dahm-Kähler et al., 2016). The infrastructure, environment, facilities and opportunities for training in gynecologic oncology vary widely across different countries. These training programs are better developed and well established in higher income countries, predominantly in the Western world. Are and his colleagues (Are et al., 2016) also reported significant variations in the surgical oncology training requirements associated with geographic region and economic status. Furthermore the lack of adequately trained surgical oncologists was found to be another significant barrier to cancer care (Sullivan et al., 2015). Investment in health infrastructure and training is also a function of a country's income. The world-bank separates countries into four income categories on the basis of gross national income (GNI) per capita, in U.S. dollars: low income (LIC: ≤\$1025), lower-middle income (LMIC: \$1026–\$4035), upper-middle income (UMIC: \$4036–\$12,475), and high income (HIC: ≥\$12,476). Global cancer incidence is expected to increase by 75% over the next 20 years (Bray et al., 2012). Most of this increase will occur in LIC and MIC. For the purposes of this paper, MIC includes both upper and lower MIC. Gynecologic malignancies including cervical, uterine and ovarian cancers are second to breast cancer in incidence and represent 16.3% and 19.2% of all cancers in women from all economies and less developed countries, respectively (Anon, 2013). Growing and expanding a properly trained workforce in these countries is crucial for fulfilling the future needs and improving outcomes of women with gynecologic cancer. In this article we examine the current state of training in gynecologic oncology in LMICs (see Table 1) and make recommendations for a way forward. Information

regarding the programmatic content was obtained from the US named affiliates or from the respective authors who have been directly involved in training or assessment of training in these regions: CJ (Africa), JN (Asia), RM (Europe), AS and LC (So and Central America).

2. Training in Africa

The gynecologic oncology training programs in Africa are mostly new since 2012, 2–3 years in duration, and have a range of training emphasis from comprehensive, similar to those in the United States, Canada and parts of the EU, to a primary concentration on cervical cancer care. Three common themes are an association with a teaching university and medical school, lack of internal funding and a reliance on outside mentorship.

2.1. South Africa

The certificate subspecialty program began in 2008 and is a comprehensive program with requirements for an exit exam, research project and a case log book. Presently, the program uniquely does not require external mentors; in fact other trainees can rotate there.

2.2. Zambia

The Gynecologic Oncology Consultation Service, a part of The African Centre of Excellence in Zambia, is based at the University Teaching Hospital in Lusaka, and was established in January 2010. The Divisions of Gynecologic Oncology at the University of North Carolina and University of California, Irvine support the service via faculty exchange visits. They also have a strong research component led by

Table 1
Gynecologic oncology training programs in LMICs.

Region	Country	Type of training in gynecologic oncology	Length of training	Scope of practice after completion of training
Africa	Ethiopia	Gynecologic oncology	2–3	Radical pelvic surgery and chemotherapy
	Ghana	Gynecologic oncology	2	Radical pelvic surgery and chemotherapy
	Kenya	Gynecologic oncology	2	Radical pelvic surgery and chemotherapy
	Uganda	Gynecologic oncology		Anticipated start 2017
	Zambia	Gynecologic oncology		Pelvic surgery
Asia	Indonesia	Gynecologic oncology	2	Pelvic surgery
	Malaysia	Gynecologic oncology	2	Pelvic surgery and chemotherapy
	Myanmar	Gynecologic oncology	3	Pelvic surgery and chemotherapy
	Thailand	Gynecologic oncology	2	Pelvic surgery and chemotherapy
Europe	Bulgaria	General Oncology	4	Gynecological oncology is not a separate subspecialty. Gynecologists undergoing this training can subsequently perform radical gynecological oncology surgery.
	Romania	Gynecologic oncology	2	All gynecological oncological surgeries. Pelvic, intestinal and urologic surgeries
	Serbia	Gynecologic oncology	1	Training is not comprehensive and continues post fellowship under the process of mentorship. Pelvic and intestinal surgeries
Latin America	Argentina	Gynecologic oncology	3	Pelvic, intestinal, urologic, breast surgeries, and chemotherapy
	Brazil	Surgical oncology	3	Pelvic, intestinal, urologic, breast surgeries
	Chile	Gynecologic oncology	2	Pelvic, intestinal and urologic surgeries
	Colombia	Gynecologic oncology	2	Pelvic and intestinal surgeries
	Costa Rica	Gynecologic oncology	2	Pelvic, intestinal and urologic surgeries
	Honduras	Surgical oncology	4	Pelvic, intestinal, urologic and breast surgeries
	Mexico	Gynecologic oncology	3	Pelvic, intestinal, urologic and breast surgeries
	Panama	Gynecologic oncology	2	Pelvic, intestinal and urologic surgeries

Zambians who trained under a NCI sponsored grant and returned to run the program. There is an extremely well developed comprehensive cervical cancer screening and care training program, most attributable to the efforts of Dr. Groesbeck Parham, the Founding co-Director.

2.3. Uganda

A gynecologic oncology fellowship 2 year training program under the joint auspices of Uganda Cancer Institute/Mulago/Makerere University (also the certifying bodies) is anticipated to start in 2017. Outside mentorship is provided by Drs Paula Lee (Duke University School of Medicine) and Stephanie Ueda (UCSF).

2.4. Kenya

A Masters of Gynecological Oncology 2 year comprehensive program approved by the Kenyan Medical and Dental Board was initiated at Moi University Medical School in 2012. Outside mentoring is provided by visiting oncologists associated with the Academic Model Providing Access to Healthcare (AMPATH) Oncology, including Dr. Barry Rosen. This program also includes rotations in communication and palliative care and has a unique strong emphasis on research. Two physicians are in training and 5 have completed the program.

2.5. Ghana

Gynecologic oncology fellowship training is a certificate program of the Ghana College of Physicians and Surgeons (GCPS) and is available to those who have completed an Obstetrics and Gynecology residency and who are members of the GCPS. It is a comprehensive model with rotations through radiation and medical oncology, pathology, epidemiology, urology and general surgery. The University of Michigan provides the outside mentorship, the monthly telemedicine-facilitated tumor board and on-site surgical training. The sole remaining program in Kumasi at Komfo Anokye Teaching Hospital (KATH) has 3 fellows in training and began in 2013. The other center lost its fellow due to frustration over his perceived lack of training support, despite being a strong teaching institution for obstetrics and gynecology.

2.6. Ethiopia

There are 3 fellowship programs, 2 in Addis Ababa and 1 in Gondar. The first program at Black Lion Hospital/Addis Ababa University School of Medicine (BLH) started in 2012, provides comprehensive gynecologic oncology training, is unique in its 3-year duration and is directed by Dr. Dawit Desalegn, one of 4 gynecologic oncologists who completed the program, passed their final exams in 2015, and received their certifications. The other 2 fellowships started in 2015 and are accredited by their medical schools and universities, St Paul's Millennium and Gondar, respectively. BLH thus has 3 practicing gynecologic oncologists and the other 2 programs rely on outside mentorship/training and visiting faculty from the Universities of Michigan, Minnesota, and Jena. They all require documentation of surgical expertise and an oral exam to receive certification of completion.

3. Training in Asia

The Association of Southeast Asian Nations (ASEAN) was formed in 1967 and current member states are: Brunei Darussalam, Cambodia, Indonesia, Laos, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. ASEAN is the 3rd largest global economy and the fastest growing economy in Asia after China. Southeast Asia also has one of the highest cancer mortality rates in the world (Bray et al., 2012). There are 24 gynecologic oncology training centers in Indonesia, Malaysia, Singapore, and Thailand, all offering somewhat differing levels of training in gynecologic oncology to meet local and national women's

cancer needs, with programs running from 2 to 6 years and focusing on surgery for cervical cancer to proficiency in the full spectrum of gynecologic oncological care including urological and colorectal surgery and managing chemotherapy. Close physical proximity of LMICs to first-world healthcare environments in Southeast Asia, means that trainees from Southeast Asian LMICs can quite easily train with mentors at facilities in more developed healthcare environments. Most of the first generation of gynecologic oncologists in Southeast Asia trained predominantly in Australia and the United Kingdom with some being trained in France, Germany and the Netherlands following traditional colonial associations in the region. A good example of an emerging economy that is interested in building rudimentary healthcare infrastructure is Vietnam. Early efforts to develop local expertise in the management of women's cancers thus far have involved ad hoc efforts to connect with NGOs and individual institutions in the US and Singapore for assistance with training. There are also countries in Southeast Asia that are only starting to build primary level healthcare infrastructure like Timor-Leste, that at present do not have the capacity to address diseases like women's cancer. Southeast Asia therefore presents opportunities, available training resources and certainly clinical need for developing expertise in women's cancer care.

3.1. Indonesia

Gynecologic oncology training is endorsed by the Indonesian College of Obstetricians and Gynecologists (SPOG). The training program is 4 semesters and available at 3 training centers in Bandung, Jakarta, and Surabaya. Completion of a training program similar to residency in obstetrics and gynecology is a requirement for all applicants. The training curriculum encompasses elements of exposure to chemotherapy, radiation oncology, classical surgical oncology and research. The College certifies sub-specialists.

3.2. Malaysia

Malaysia has one program that is centrally organized by the Ministry of Health (MOH). The national curriculum is taught at 8 centers which are primarily hospitals run and managed by the MOH. The program is 3 years with an option to spend one of the 3 years overseas. There is exposure to chemotherapy, radiation oncology and trainees are expected to publish one paper. There is a qualification process which involves an oral examination and a review of the case logs for candidates applying for sub-specialist recognition by the MOH, a process known as gazettelement.

3.3. Thailand

There are 10 centers in Thailand which conduct gynecologic oncology training under the auspices of the Royal Thai College of Obstetricians and Gynecologists (RTCOC). It is a 2 year program during which trainees get primarily surgical training with some exposure to medical and radiation oncology. Thailand has a healthcare infrastructure where access to urological and colorectal or general surgical expertise is not often an issue and as such bowel and bladder surgery are not core to the training curriculum. There is a certifying examination conducted by the RTCOC which also involves a case log review.

3.4. Laos

Laos is in the process of developing a national program and is sending trainees to Thailand to acquire the necessary exposure and expertise to help build the infrastructure in Laos.

4. Training in Europe

Although the European Society of Gynecological Oncology (ESGO) has made a number of strides towards harmonization of training by setting minimum standards and introducing and promoting a common training curriculum/program as well as system of accreditation, training opportunities and standards still vary significantly across European countries. Gynecologic oncology still remains unrecognized as an independent sub-specialty in many European countries. Most European programs vary between 2 and 3 years with a median length of 2.5 years. Developing complex surgical skills for independent practice is well recognized as one of the more challenging aspects of subspecialty training. Additionally, trainees need to develop non-surgical proficiencies in medical and radiation oncology, palliative care, cancer genetics and research. Furthermore, clinical practice and training programs need to keep up to date by timely incorporation of new technological and scientific advances. Accredited programs are well structured and have a detailed curriculum, competency based logbook and structured assessments. Unfortunately low and upper middle-income countries (MICs) in Europe lack ESGO accredited well-structured training programs. Training in these countries is loosely or moderately structured. We have previously shown that training satisfaction and quality is significantly higher in accredited European programs ($p < 0.0005$) with 17 of 22 aspects of the training curriculum scoring higher in accredited centers (Manchanda et al., 2013a). Additionally, data show that the overall educational climate including supervision, coaching/assessment, feedback, teamwork, inter-consultant relationships, formal education, role of the tutor, patient handover, and overall consultant's attitude towards training is significantly better ($p = 0.001$) in accredited centers (Piek et al., 2015). Given complete lack of accredited structured training in European MICs, the clinical learning climates, quality and satisfaction with training in these countries is significantly poorer than HIC. The need for better feedback mechanisms as well as workshops in laparoscopic surgery, anatomy and imaging have been highlighted as areas of greater need (Piek et al., 2015; Manchanda et al., 2013b). Trainees in HIC countries attach significantly greater importance to additional training in cancer genetics and radiotherapy than do MIC trainees (Manchanda et al., 2013b). There is a pressing and urgent need for harmonization and increase in accredited gynecologic oncology training centers in MICs in Europe. Local national societies and political stakeholders or structures have a crucial role to play in achieving this end. The recent establishment of the European Network of Gynecological Oncologists as a network of trainees led to an increased awareness of the need to improve training and to engage with trainees as well as to the creation of numerous initiatives to improve the quality of training. This includes workshops, masterclass, establishment of web based resources (e-academy) and involvement of trainees in the accreditation process. This endeavor can serve as a potential model for trainee engagement and development in other parts of the world.

5. Training in Central America

Gynecologic oncology training varies from the absence of formal training in Nicaragua and Guatemala to established gynecologic oncology fellowship programs in El Salvador, Costa Rica, and Panama. Many of the gynecologic oncology training programs in Central America are included as part of the surgical oncology programs. One example is the surgical oncology residency program at Hospital San Felipe in Honduras, the only public cancer center that provides care for women and men in a nation of nearly 9 million people. Trainees obtain their gynecologic cancer surgery training in a surgical oncology residency that is offered for graduates from medical schools or after completion of a residency in obstetrics and gynecology or general surgery. In addition to being trained in managing patients with gynecologic malignancies, residents are trained to manage breast, liver, colorectal and prostate cancers. During the 4 year training program in surgical oncology, residents typically

rotate to gynecologic oncology services 4 months each year as cervical, ovarian and endometrial cancers represent the most common cancers in women in Honduras. To make up for the lack of education resources including Spanish textbooks and journals, residents learn to read English language medical textbooks. Residents are given tests monthly based on their assigned reading materials. Daily conferences are conducted in the morning to review pertinent cases or topics. There are no multidisciplinary tumor conferences conducted on a regular basis. In Hospital San Felipe, there is no brachytherapy to treat patients with cervical cancer (Chuang et al., 2016). Since > 100 patients are treated with 2 Cobalt radiation machines every day, residents learn to manage patients based on the local guidelines and not from more current oncology textbooks. Training in gynecologic oncology in Honduras is challenging due to the lack of resources that fellows have for learning and treating patients. The Central America Gynecologic Oncology Education Program (CONEP) and Health Volunteers Overseas supported by Society of Gynecologic Oncology (SGO) and American Society of Clinical Oncology provide the outside mentorship, the telemedicine-facilitated tumor board and on-site surgical training in Central American countries. Major support in infrastructure and education of these trainees will help to improve gynecologic oncology training and care for their patients.

6. Training in South America

There are great variations in training of gynecologic oncology in South America. In Brazil, surgical gynecologic oncology is currently part of two specialties: surgical oncology (SO) and obstetrics and gynecology (ObGyn). There is no certification for professionals dedicated to gynecologic oncology. Adjuvant therapies are managed by medical oncologists and radiation oncologists. Around 34% of all cancer patients are currently treated in referral cancer centers. Gynecologic oncology training is included as part of SO residency programs. These programs are regulated and accredited by National Education Organization. The prerequisite for entering a SO fellowship is 2 years of general surgery training. Didactic lectures, surgical training, cancer prevention, palliation and multidisciplinary managements are emphasized. Research is encouraged but not mandatory. During the 3 years of SO training, residents spend 3–16 months rotating on the gynecology oncology service. Some centers offer an additional training in minimally invasive surgery or radical surgery on management of peritoneal surface diseases. Gynecology oncology (GO) training, which typically lasts between 1 and 3 months, is also available in the three year Obstetrics and Gynecology residency programs. Interested residents have the option of pursuing GO training in one of the 15 centers upon completion of the OB/GYN residency program. This specialty training is offered for a fee of \$1200–5000, and the length of training varies from one weekend/month for 12 months to as much as 60 h/week for 2 years. Only 2 of these programs provide a minimum core curriculum and regular evaluations of their trainees.

7. Developing gynecologic oncology training in LMICs: successful examples and challenges

To develop gynecologic oncology training in LMICs requires that several layers be present, including those from the country in question and, at a bare minimum, a willing foreign gynecologic oncologist/s to assist. From the LMIC perspective, this would include a teaching hospital with willingness to free fellows in training from some of their service responsibilities, hospital infrastructure (pathology, operating rooms, other surgical services, critical care, basic laboratory tests, available chemotherapy and radiation therapy, an opportunity for research, internet access), a certifying body, a structured and committed program, patients to treat, fellows that have completed a gynecologic residency, and a designated program head.

One cannot expect the process to be easy, without hurdles and immutable. Flexibility, creativity and persistence are key personality traits

to success. The standard expectation is that gynecologic oncologists do it all, at least when trained in the USA. This may be unrealistic in LMICs, where lower volume of general surgical and urologic procedures warrants collaboration with their respective surgical colleagues. With time and volume, more of these procedures will likely be performed by gynecologic oncologists. Additionally, a reliance on hand-sewn bowel anastomoses helps to keep the bowel surgery in the hands of the experienced general surgeon who can be called in to assist. When the concept of a fellowship was first presented to a gathering of the heads of the departments (HOD's) to be involved in the proposed gynecologic oncology training at the teaching hospitals in Ghana, the surgeons and urologists expressed concern that they were going to lose cases, however once reassured that they would still be involved, this apprehension abated. When altering the status quo, it is important to propose, discuss and modify to fit the local training environment and this group presentation to the pertinent HOD's prior to the initiation of the fellowship in Ghana was essential. Training other physicians, changing processes such as requiring more detailed pathology review of oncology cases and adding conferences to an already overloaded schedule can be perceived as a burden and rejected unless presented as an option for discussion, voluntary participation and a teaching opportunity for trainees in other disciplines. In order to facilitate these changes, several exploratory trips as an invited teacher and surgical consultant to gain inside knowledge were useful in Ghana prior to helping them organize a feasible fellowship program.

Experience with the facilitation of the development of gynecologic oncology fellowships in Ghana and in Ethiopia has revealed obvious and not so apparent requirements and hurdles. Based on the realization that it is imperative that the training be done in-country with outside assistance in order to retain trainees, specific curriculums were developed which utilized existing resources at their respective medical schools, itemized learning expectations and milestones, specified examination requirements, and identified outside mentors and institutions where observerships could occur. These formats differed for the two countries due to availability of integral rotations such as radiation and medical oncology, urology, pathology and general surgery, but the unifying factor was a consistent presence of a gynecologic oncologist to operate, make clinical rounds, evaluate patients in clinics and teach at the respective hospitals. Difficulties with this model are the need for the fellows to continue their daily hospital work and call responsibilities while participating in the fellowship, insufficient frequency and availability of mentoring visits by external gynecologic oncologists, lack of funding for Ghanaian fellows to receive the required 6 month rotation for continuous hands-on gynecologic oncology surgical experience at a foreign institution under the tutelage of experienced gynecologic oncologists and for outside mentors to travel, inexperienced and understaffed pathology departments, and inadequate radiation facilities. These challenges are in fact generalizable to many LMIC subspecialty training situations. The fellows at KATH who achieved a work around by devoting their required clinic time to oncology patients only exemplify one solution. This switch took awhile to install as the general obstetrics and gynecology work then shifted to other consultants. In order to make a lasting impact, those at the site rather than the outside mentor best do education of the other members of the department regarding the importance of specialty care. The goal is for the institutions with fellowships to be independently training other fellows in 3–5 years. However to be able to achieve this goal, they will still need ongoing external assistance for a while. Three years ago we established a monthly gynecologic oncology tumor board by telecommunication with the training program in Kumasi, Ghana to alleviate some obstacles. The highlights of this have been the achievements made in real time management of cases and simultaneous teaching process benefiting fellows and residents in obstetrics and gynecology, oncology, and pathology as well as the patients. The associated challenges include the sustainability of the project, adequate real time pathology slide presentation and getting other teaching programs on board.

8. High priority topics for LMICs

8.1. Curriculum

The process of curriculum development for LMICs should take into account the prime directive of context-sensitivity. Zetka's analysis of the history of the rise of gynecologic oncology as a subspecialty in the United States is instructive (Zetka, 2011). While well intentioned and well informed, professional bodies engaged in developing training programs in gynecologic oncology in LMICs must also be politically savvy and culturally sensitive. With regard to cultural sensitivity, one gynecologic oncologist's experience in Mongolia is most enlightening (Elit, 2005).

The key to developing a curriculum in gynecologic oncology for LMICs that is useful and effective, lies in crafting a program that is modular, adaptable and yet robust enough to produce the desired end result to meet the needs of each LMIC. It is also important that such a training program be able to nurture an identity of professionalism and instill a sense of ownership of the special knowledge and skills, ultimately producing healthcare professionals that identify themselves as gynecologic oncologists, and who are able to carry the subspecialty forward in their home countries (Holden et al., 2015).

This at a minimum would include a comprehensive didactic component that outlines a list of basic competencies that can be used by mentors and trainers to monitor a trainee's assimilation and retention of a clinically relevant fund of knowledge, an externally well supported surgical skills component with a curriculum built to accommodate trainees who come into the program with wide variations in basic surgical skills and clinical experience. That said, it is probably best to assume the lowest common denominator of skills, i.e. only laparotomy experience. The skills curriculum must also take into consideration the variety of pathways through which trainees arrive at gynecologic oncology training in LMICs; for example, as an extension of general surgery and surgical oncology training or following a residency in obstetrics and gynecology.

8.2. Training support

The training process required to become an accredited consultant gynecologic oncologist is grueling, challenging, and arduous and necessitates development of a broad multifaceted skill set. Both trainers and the training institution work environment or learning climate have a critically important role to play in maximizing training outcomes and experience (Piek et al., 2015). Some institutions facilitate this process better than others and are able to impart higher quality training. Training needs may clash or be at odds with clinical service commitments and increased work pressure/workload can make learning more difficult. Trainees should be trained in institutes with accredited well-structured training programs having a minimal defined and monitored set of standards, caseload, and infrastructural and organizational processes (Manchanda et al., 2013a). This leads to well supported trainees with better supervision, training, formalized structured education, assessment, feedback and higher training satisfaction (Manchanda et al., 2013a; Piek et al., 2015). More favorable educational climates reduce pressures, stresses and conflict, leading to better quality learning. Data indicate that trainees need to be supported better in terms of timely and effective feedback (Piek et al., 2015). Proper training in giving feedback (e.g. training the trainers courses) has been shown to improve teaching performance which would likely be a benefit in situations of limited exposure to outside mentors to LMICs (Bing-You and Trowbridge, 2009). Trainees also need support and opportunity to develop more complex surgical skills like advanced debulking, laparoscopic, urological and colorectal surgery (Manchanda et al., 2013a, 2013b). Skill and competency development can be enhanced, knowledge gaps filled and learning facilitated by dedicated workshops, dry/wet lab, cadaveric, simulator training, watching surgical videos and working as an embedded member of the colorectal and urological teams. Most

training programs suggest a research component but this requires funding and protected time, both of which are often a challenge to find. However, it is important to maintain the right balance between these aspects as excessive research time can lead to an extension in the duration of training and time is often at a premium in LMICs. Recruitment and retention to our subspecialty can be challenging. An unsupportive institutional training climate, inferior work life balance, poor pay coupled with longer working hours are known reasons why obstetrics and gynecology trainees don't pursue a career in gynecologic oncology (Dodge et al., 2010). Program organizers will need to take cognizance and consider steps to address these issues to develop a more balanced and happier workforce.

8.3. National or governing society support

Professional medical educational societies may play a fundamental role in the process of a professional identity formation (Heitz, 2015), yet many LMICs do not have them. For example, in Brazil, where GO training is an extension of SO, in 2015, a group of surgical oncologists from the Brazilian Society of Surgical Oncology and gynecologists with the support of the President of SGO, Dr. Robert Coleman, started a steering committee towards establishing a GO society in Brazil with one goal of working to define GO as a subspecialty within the Brazilian Medical Association and thereby promote education, training and care for women with gynecologic cancer. This exemplifies a major achievement of mutual understanding and collaboration among heterogeneous professionals focused in the same field. In contrast, in Ghana, it was important to have the Ghana College of Physicians and Surgeons recognize the relevance of the subspecialty, as they are the certifying body for medical training. They standardized the GO training expectations and certificate qualifications. In other countries, the affiliated local University or the Ministry of Health is the certifying body. Recognition comes in many forms. In the developed world, with decades of training experience and large numbers of trained sub-specialists, a subspecialty board or body works, but in LMICs where gynecologic oncology training is newer perhaps what is most important is sound support from either medical certifying bodies/boards or ministries of health.

9. Conclusion

Training in gynecologic oncology is lacking in many regions around the world. Even in the established training programs, there are significant variations between them with regard to the disciplines that are taught. While surgical training in pelvic surgery including radical hysterectomy is universal, intestinal and urologic surgery are not usually included as part of the formal training in Asia. In European countries, chemotherapy is often managed by medical rather than gynecologic oncologists. It is important to remain cognizant of these variations in the planning of gynecologic oncology training programs in LMIC. Selection of sites for training is equally important.

The lessons learned in facilitating training programs in Ghana and Ethiopia are that fellowship sites should be located at stable, established teaching institutions with a strong commitment to fellow education, as well as have available basic oncology and pathology resources, frequent regular visits by outside gynecologic oncology mentors, access to telemedicine real time tumor boards, and outside pathologists who are

willing to help teach the subtleties of gynecologic cancer pathology. To this end, the International Gynecologic Cancer Society established an Education Committee that has developed a training program format to be piloted at 3 sites that will build on these general tenets, and also provide sustained frequent visits from mature gynecologic oncologists to assist in training. Also if the trainees are to become certified oncologists, then the facilities and treatment resources must also exist for them to perform, thus the countries and medical schools are going to need to update and increase the number of their radiation oncology machines and pathology resources, in particular. This will likely require the support of the Ministries of Health.

Finally, the primary challenge and the key to success for any program aiming to provide gynecologic oncology training assistance to LMIC is being flexible and responsive enough to adapt to the broad spectrum of needs in each country and to deliver expertise in a context-specific, culturally-sensitive and politically-expedient manner.

Conflict of interest statement

None of the authors has a conflict of interest.

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