

# Reaching the women with the greatest needs: Two models for initiation and scale-up of gynecologic oncology fellowship trainings in low-resource settings

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## Abstract

Women in low- and middle-income countries (LMICs) are significantly more likely to develop and die from invasive cervical cancer, while rates of other gynecologic malignancies are comparable to those faced by women in high-income countries. Despite this increased need, there are few specialist physicians in LMICs available to treat women with gynecologic cancers. Training specialists in low-resource settings faces multiple challenges, including ensuring protected time from other clinical demands, access to best practice guidelines, training that is tailored to the specific challenges faced in the trainee's environment, isolation from other fully trained professionals, and securing support services. In addition, training specialists from LMICs in high-resource settings is costly and return of trainees to their own country is not guaranteed. Here we describe two approaches to gynecologic oncology training in LMICs. The International Gynecologic Cancer Society (IGCS) developed the Global Curriculum Mentorship and Training Program (Global Curriculum) to support gynecologic oncology fellowships in regions of the world that do not currently have formal training in gynecologic oncology. In India, on the other hand, leaders in world-class gynecologic oncology centers must find a way to meet the training needs of a vast and disparate country.

## KEYWORDS

education, fellowship, FIGO Cancer Report, gynecologic oncology, human capacity, LMICs, surgery, training, workforce

## 1 | INTRODUCTION

Women living in poverty have limited access to specialty medical services and suffer increased burdens of disease and death. The

Lancet Commission on Global Surgery found that access to surgeons, anesthetists, and obstetricians in low- and middle-income countries (LMICs) is severely limited, with very low numbers of these specialists available. A survey of surgeons, anesthesiologists, and obstetrician/gynecologists found that only 1.1% of these specialists worldwide work in low-income countries.<sup>1</sup> Those specialists working

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in LMICs face heavy clinical demands. For example, obstetrician/gynecologists in LMICs often face far higher numbers of patients with more acute conditions, as evidenced by the very high rates of maternal mortality seen among women living in poverty.

Globally there are approximately 604 000 new cervical cancer cases and 342 000 related deaths annually, with over 90% of the women affected living in LMICs.<sup>2</sup> Cervical cancer is the leading cause of death in 42 countries, mainly across Sub-Saharan Africa and Southeast Asia. Though uterine and ovarian cancers are less common among women in LMICs, the case fatality rates are higher, such that these cancers are significant burdens in these settings.<sup>3</sup> In 2018 the World Health Organization (WHO) released a global call to action to eliminate cervical cancer as a global health problem.<sup>4</sup> This strategy calls for vaccination of 90% of girls by age 15 years, screening of 70% of women with a high accuracy test at ages 35 and 45 years, and treatment or palliation of 90% of women found to have preinvasive cervical disease or invasive cervical cancer.

The call for an increased workforce of gynecologic cancer specialists in LMICs faces multiple challenges. Many countries have few, if any, senior gynecologic oncologists available to lead training. General obstetrician/gynecologists face high demands from obstetrics, limiting time and energy available for advanced training to provide cancer care. Infrastructure is more limited in most LMIC hospitals, making access to surgical equipment, operating room time, blood banking, anatomic and laboratory pathology, imaging, and radiotherapy limited or unavailable. Medical record keeping may be inconsistent and research facilities limited. Thus, gynecologic oncologists in low-resource settings are likely to face conditions for which training in a high-resource setting might leave them ill-prepared. On the other hand, these demands of life and work in low-resource settings are difficult to establish training programs.

Some academic obstetrician/gynecologists in LMICs have been able to support gynecologic oncology training through ongoing partnerships with academic gynecologic oncologists from more resourced universities.<sup>4</sup> These relationships take a variety of forms; in our experience, the most effective partnerships are sustained, structured, accountable, and trainee focused. While the ideal system would place qualified mentors permanently on site, this arrangement has proven prohibitive in terms of costs and logistics in all but a few cases in countries where no training was available.

On the other hand, meeting the needs of middle-income countries poses a different challenge. In India, for example, there are gynecologic oncology fellowships providing state-of-the-art, resource-intensive gynecologic cancer care, leading many wealthy women from other countries to travel to India for care. Yet India is a vast and diverse country and many women who live in poverty or who live in rural areas face tremendous challenges to get care for gynecologic cancers.

Ultimately the goal of a training program in gynecologic oncology is to produce academic physicians who are champions for women with gynecologic cancers. They must be able to work optimally in

their context while improving local conditions for their patients; this may include both guiding their patients through complex health systems and publicly advocating for women with cancer. They should be able to address the particular challenges their patients face through clinical care, scholarship, and research that is specific to their context.

## 2 | TWO APPROACHES TO REACH UNDERSERVED WOMEN WITH GYNECOLOGIC CANCERS

### 2.1 | Approach 1. Establishing gynecologic oncology training: the IGCS Global Curriculum Mentorship and Training Program

Starting in 2015, the International Gynecologic Cancer Society (IGCS), under the guidance of the then President, Michael Quinn, utilized its convening powers and the energy of its membership to leverage relationships between high-resource and lower-resource institutions to establish, align, and sustain gynecologic oncology fellowships in LMICs, where no such training had previously been available. These fellowships were expected to be responsive to their local environments while maintaining the highest international standards in academia and professionalism.

#### 2.1.1 | Structure of the Global Curriculum Program

The IGCS identified the need to train experts in gynecologic oncology within and for low-resource settings through support of sustained relationships between teaching faculty in high- and low-resource centers.<sup>5</sup> The Global Curriculum fellowships have an essential structure that involves twinning of institutions, virtual training, hands-on training, ongoing metrics and evaluations, and a final examination with a certificate of completion. The specifics of training vary by program, but all fellows gain a common fund of knowledge and acquire a fundamental set of skills at completion. Expectations for learning and metrics are outlined in a standard curriculum that is shared with each program.

Applications were solicited from physicians who had built either individual or institutional partnerships between high-income countries and LMICs. The potential for fellow training was evaluated with a brief survey to identify personnel, facilities, clinical volumes, and resources available at the sites. Sites selected for participation in the Global Curriculum sign a Memorandum of Understanding, committing the IGCS and participating institutions to support of the fellowship in a clearly defined and explicit fashion.

Global Curriculum fellows receive the majority of their hands-on training at their LMIC institution site. Faculty for the Global Curriculum fellowships are comprised of international mentors and local mentors. International mentors are fully trained gynecologic oncologists from institutions in high-income countries who are

committed to ongoing virtual engagement with the fellows as well as regular in-person visits for hands-on surgical and clinical training. Local mentors are teaching physicians at the host LMIC institution who are committed to the care of women with gynecologic cancers and who may or may not have received formal training in gynecologic oncology. At most sites cancer surgeries and patient care are performed throughout the year by the fellows and local mentors, with additional support from the international mentors when they are on site. International mentors remain available for discussions of patient management. Many programs schedule their most complex surgeries to be performed while an international mentor is present.

There is an established curriculum that outlines the expected areas of knowledge fellows are to study during their training, with references to pertinent texts and articles. Multiple textbooks have been given to the trainees, and in 2020, each trainee was given a subscription to UpToDate (Wolters Kluwer).

Each fellowship site holds a monthly Project ECHO tumor board via Zoom (Zoom Video Communications Inc) (Figure 1). Project ECHO is a standardized form of telementoring first developed for remote mentoring to facilitate complex medical management of hepatitis C in rural New Mexico<sup>6</sup> and later adapted widely to include remote mentorship for a variety of conditions including preinvasive cervical disease and invasive gynecologic cancers.<sup>7</sup> The Global Curriculum ECHO conferences include review of complex gynecologic cancer cases, usually with pathology review, evidence-based management recommendations, and didactic teaching. The fellows present the cases and are given feedback and treatment recommendations from the international mentors and additional volunteer faculty from the IGCS membership. These Project ECHO tumor boards are multidisciplinary with gynecologic oncologists, pathologists, and radiation oncologists joining from both LMICs and high-income countries. Participation in these sessions is tracked by the trainee and centrally by the IGCS administrative staff.

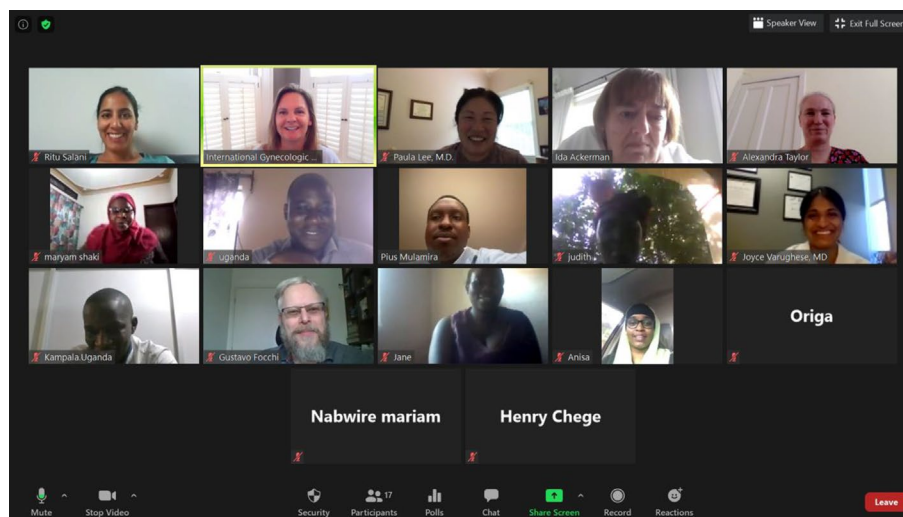
Fellows enter all their surgical cases, ECHO participation, and other fellowship milestone information into a REDCap (Research Electronic Data Capture) database,<sup>8</sup> which is maintained by the IGCS administration. The Global Curriculum sets targets for expected numbers of cases to reach proficiency for key procedures such as radical hysterectomy or pelvic lymph node dissection. It is acknowledged that local circumstances and infrastructure may limit the performance of some procedures; for example, few para-aortic lymph node dissections are expected at sites where blood banking is limited. Each fellow is expected to document a minimum number of cases as well as document participation in ECHO conferences and feedback sessions with mentors.

When fellows and their local and international mentors feel that they have met metrics for completion of training, they are expected to complete a structured attestation to that effect and notify the IGCS Mentorship and Training Committee. If the fellow appears ready, the IGCS arranges for the fellow to have an objective structured clinical examination (OSCE) administered by an independent examiner who is familiar with the setting but not part of the fellowship. Fellows who pass the OSCE are awarded a certificate of completion of the Global Curriculum.

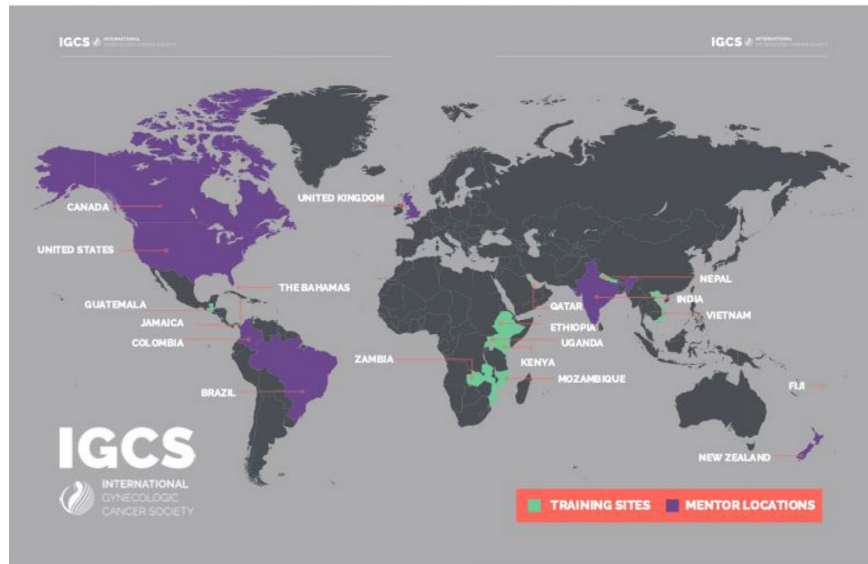
## 2.1.2 | Outcomes to date

The Global Curriculum launched in 2017 with five programs: one each in Kenya, Ethiopia, Vietnam, Guatemala, and Mozambique. As of 2020, the Global Curriculum includes 12 total programs, having added sites in Zambia, Jamaica, the Bahamas, Nepal, Fiji, Uganda, and Qatar (Figure 2). There are 32 fellows across these sites supported by 29 local mentors and 26 international mentors.

Over the first 4 years of our program, 44 trainees logged 10 225 surgical procedures, including 689 radical hysterectomies,



**FIGURE 1** International Gynecologic Cancer Society (IGCS) Curriculum ECHO Session. Screen shot from an ECHO tumor board for the Uganda IGCS Gynecologic Oncology Fellowship site. Trainees and faculty from Uganda as well as from seven international training centers are seen



**FIGURE 2** Map of the International Gynecologic Cancer Society's Global Curriculum Gynecologic Oncology Fellowship Programs. The national locations of the IGCS gynecologic oncology training sites and of the international mentors are shown

1953 simple hysterectomies, and 1163 pelvic lymphadenectomies. Trainees logged 244 procedures in 2017 and 3122 procedures in 2020. Despite the coronavirus (COVID-19) pandemic, three trainees took the final exam in 2020 and, to date (June 2021), eight have taken the exam in 2021 and successfully completed their training. Over the course of their fellowship training, the 14 graduates from IGCS fellowships averaged 891 simple hysterectomies, 31 radical hysterectomies, and 45 pelvic lymphadenectomies each.

Prior to the COVID-19 pandemic, our international mentors made over 50 trips to the host training sites for teaching and supervision annually. Similarly, over 300 cases of women with cancer are discussed in our ECHO tumor board conferences each year, with over 120 faculty volunteering over 1500 hours in attendance time alone. Many additional hours are contributed by faculty in preparation for conferences, informal communications, and regular case discussions outside of the formal tumor boards.

Since 2017, IGCS Global Curriculum trainees have published 19 articles in peer-reviewed publications and presented 47 abstracts, including 31 abstracts at international meetings. All of our fellows were able to attend the 2020 Annual Meeting of the IGCS, which was held virtually due to the COVID-19 pandemic. Forty-five abstracts and articles have been published in collaboration with international mentors, while 21 have been published independently with local colleagues.

### 2.1.3 | Observations

The IGCS Global Curriculum has overcome many of the challenges inherent to subspecialty training in low-resource settings. Faculty and trainees in such settings can see a need but do not have access to the

resources and expertise needed to care for women with gynecologic cancers. Faculty in high-resource institutions may see the need for gynecologic cancer care in low-resource settings, but face commitments at home that prevent them from making full-time commitments to that mission. When these groups join, they are able to create the basis of a complete fellowship. The IGCS, as a professional society, is able to bring additional expertise, organizational structure, accountability, administrative support, and a small amount of financial support.

Having worked with these teams for the past 4 years, we believe that this structure supports the development of uniquely capable individuals. Our graduates performed numbers of radical hysterectomies during their training comparable to major European and North American fellowships; this is remarkable in settings where little cervical cancer screening is performed and the vast majority of women with cervical cancer present with advanced-stage disease. These surgeries are even more remarkable when performed in operating theaters where blood supplies may be limited and inconsistent, power supplies can be unreliable, and sutures and surgical equipment such as electrocautery instruments may be scarce.

Global Curriculum graduates have experience and expertise in their local context, they have support from international and local faculty, and as local trainees they have a high level of support from local and regional institutions. We are encouraged to see that these trainees have been able to perform effectively in highly challenging circumstances, and we have established their competence at international standards through ECHO conferences, ongoing evaluations, and the exit examination.

The focus of the Global Curriculum is to train gynecologic oncologists who are champions for women with cancer in low-resource settings. Clinical competence is a vital part of this, but it is also important to advance this part of the field academically. Clinical trials

in gynecologic oncology have overwhelmingly included women of European or East Asian ancestry. It is unclear how perfectly these data apply to women of different ancestry who are living in poverty, subject to infectious diseases and undertreated noncommunicable diseases, who may also face stresses around food, housing, and safety. It is vital to identify optimal treatment for these women, as well as to understand how to most effectively deliver care and support healthy lives. We hope to train gynecologic oncologists who can provide both safe, effective, and empathic care and lead this field of inquiry.

We believe that the early results of the Global Curriculum have been favorable, but we face significant challenges. At the time of writing (June 2021) the COVID-19 crisis has slowed clinical care at many of our sites, and it is unclear what support and funding will be available from host countries and institutions as the crisis resolves. While each of our host countries and institutions has shown tremendous support for the program, maintaining consistent funding and leadership support is not always straightforward in countries and institutions with limited resources. Some of our graduated fellows have found it difficult to find work as gynecologic oncologists in the public sector. We hope that continued support and leadership from the WHO and from civil society will identify the need for gynecologic oncologists in all health systems. While we are proud to support 12 fellowships, our professional society will need additional support to expand the number of fellowships needed to provide for women with gynecologic cancers in LMICs. Lastly, while we are pleased to support the training of gynecologic oncologists, we recognize that many other team members are needed to provide optimal care for women with gynecologic cancers. We welcome partnerships with other professional societies and institutions to build the whole

ecosystem of professionals needed, including pathologists, radiation and clinical oncologists, nurses, palliative care specialists, and more.

The IGCS established the first fellowship level training supported by partnerships of multiple academic institutions and a medical professional society. We believe that this represents a viable model that could both expand and serve as a model to other specialties. We do not see the program as a replacement of national and regional professional organizations, but as a bridge from a setting with no specialty care to one with a vigorous and independent academic community. In building this bridge we hope we are taking a significant step to care for some of the world's most disadvantaged women.

## 2.2 | Approach 2. Meeting the needs of women with gynecologic cancers in India: a two-tiered approach

India is a country with a population of 1.4 billion and huge disparities in wealth and resource distribution, as well as geographical, social, and cultural differences among regions and states. These disparities are also reflected in the distribution of cancer care, which varies from state-of-the-art care at tertiary level centers in major cities to basic care at hospitals in smaller towns, whereas it is almost nonexistent in rural areas.<sup>9</sup> In India, cancer control is part of a more comprehensive program on noncommunicable diseases, called the “National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Disease and Stroke (NPCDCS)” where the common risk factors are addressed in an integrated manner.<sup>10</sup> Figure 3 depicts the referral system from lower- to higher-level health facilities depending on need and availability of resources.

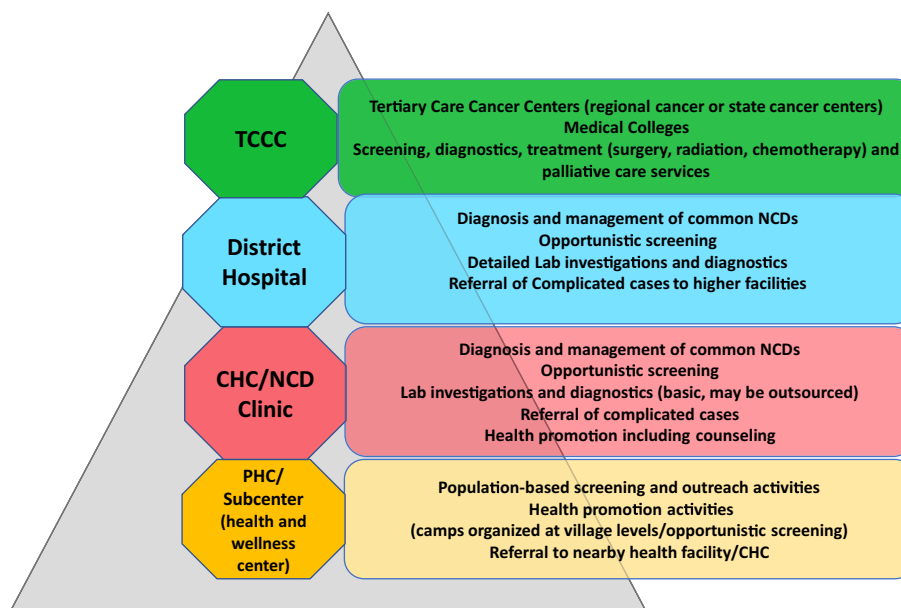


FIGURE 3 Referral system from lower- to higher-level health facilities and available services. CHC/NCD, Community Health Center/Noncommunicable disease; PHC, Primary Health Center; TCCC, Tertiary Care Cancer Center

Due to poor uptake, screening services largely remain opportunistic at all levels. Facilities and services for cancer management, such as chemotherapy and radiotherapy, are available only at tertiary care institutes and dedicated state or regional cancer centers, operating under joint control and funding from state governments and the government of India. Currently, there are 25 such centers in India<sup>11</sup> (Figure 4). In addition, there are several private multispecialty hospitals and dedicated cancer institutes, but these are available in urban areas and rural areas remain deprived.

Gynecologic cancer care in particular remains fragmented; gynecologic oncologists are very few in number and therefore gynecologic cancer services are also provided by surgical oncologists, general gynecologists, or general surgeons. Hence, due to lack of awareness, knowledge, skills, and uniform protocols, many patients do not get suitable treatment. Frequently, women seeking cancer care face grueling travel and have a high risk for medical bankruptcy. Academic training opportunities for subspecialty training in gynecologic oncology are provided by select institutions only, as outlined below (Figure 5).<sup>12,13</sup>

While gynecologic oncology is a relatively new subspecialty in India, subspecialty degree courses have been established over the past two decades, and many of these centers offer high-volume world-class clinical care, exemplary teaching, and high-impact research.<sup>14</sup> However, these are limited to a few large academic institutions in large urban centers. More recently, similar courses were instituted by the National Board of Examinations, which allowed other centers having suitable faculty and adequate case load to offer training. However, even with these added programs it would take

decades to meet the gynecologic cancer care needs in a country as large and diverse as India and, as the existing workforce and facilities are concentrated in urban centers, rural areas and women living in poverty are underserved.

Provision should be made for catering to these two diverse situations: training highly qualified academic gynecologic oncologists, while also training larger numbers of physicians in more basic clinical gynecologic oncology to serve the immediate needs of the population outside the coverage of academic or comprehensive treatment centers.

### 2.2.1 | Training academic gynecologic oncologists: subspecialty training in gynecologic oncology leading to Master of Surgery (MCh) or Diplomate of National Board (DNB)

Fully qualified and well-trained gynecologists with postgraduate degrees in obstetrics and gynecology are eligible to compete for these rigorous programs. These are comprehensive structured programs spanning 3 years and cover all theoretical and practical aspects of gynecologic oncology and allied specialties, comparable to gynecologic oncology training across North America, Western Europe, and East Asia. There are requirements in surgical competence and research methodologies. These candidates are trained in the latest advances in surgical and clinical techniques, including minimally invasive surgery, robotics, ultraradical cytoreductive surgery, and hyperthermic intraperitoneal chemotherapy.

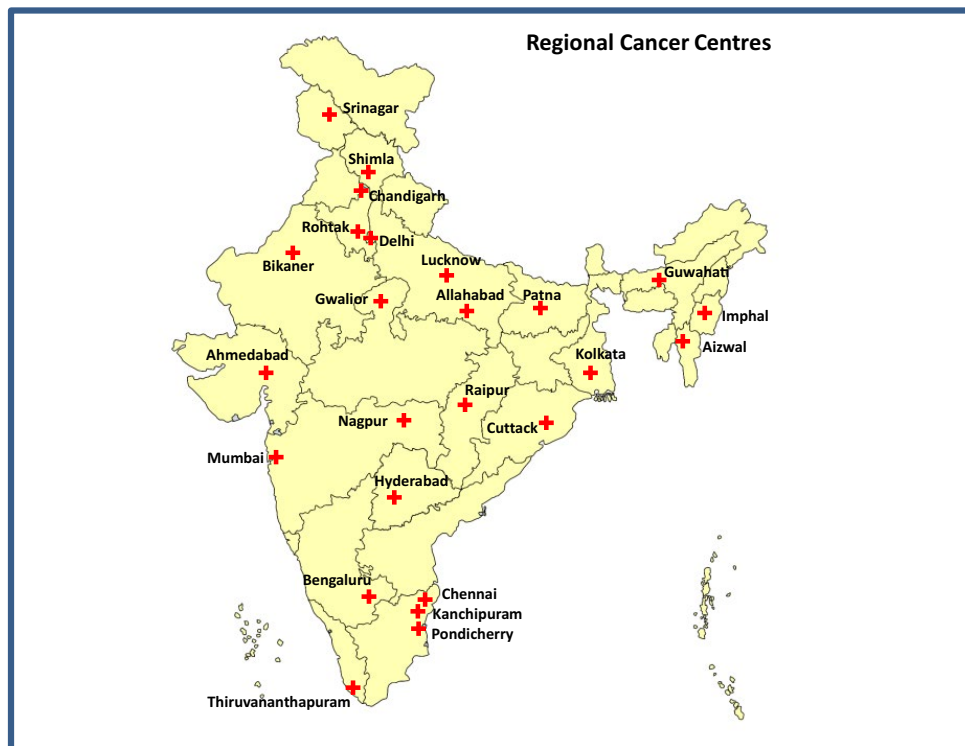
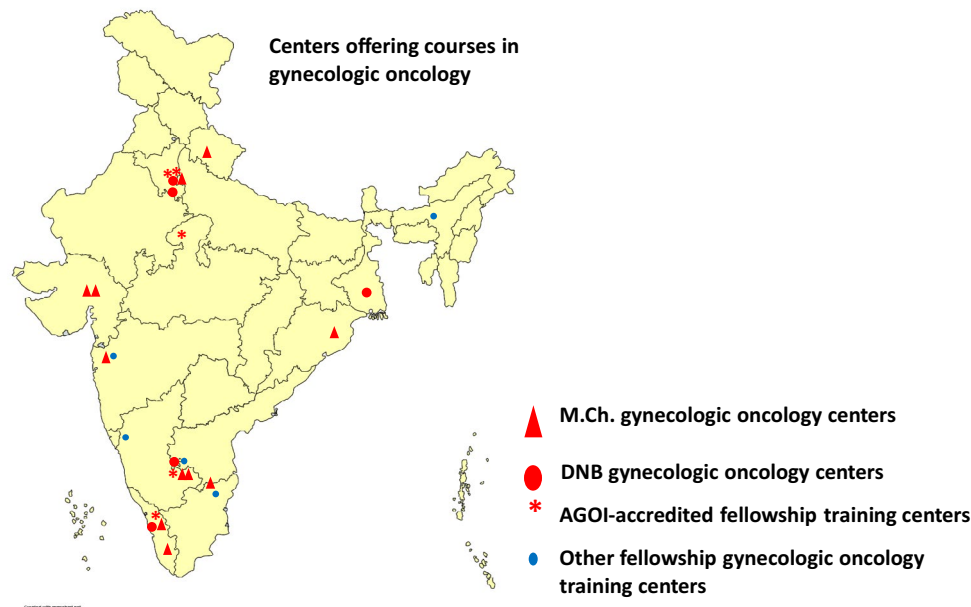


FIGURE 4 Regional cancer centres in India



**FIGURE 5** Geographical distribution of centers offering academic courses in gynecologic oncology. Distribution of gynecologic oncology training positions throughout India, including: 23 positions at universities providing an MCh degree in gynecologic oncology, 8 positions at centers providing a DNB certificate in gynecologic oncology, 7 positions in AGOI accredited gynecologic oncology fellowships, and 8 positions in gynecologic oncology training at other centers, for a total of 46 gynecologic oncology training positions across India

Even at this level some improvements are still needed. Currently, the training mainly focusses on clinical and surgical aspects, whereas research is relegated to simple studies with limited patients. There is a need to improve the quality of research training to meet the need to develop a robust evidence base that is fully generalizable to women in low-resource settings. Though the format is fairly uniform, the actual training is dependent upon the expertise, facilities, and case load at individual centers. It would be beneficial if these trainees, after qualification, spent another 2 years as junior associates in high-volume centers, to increase their surgical and clinical experience. To acquire more advanced skills the gynecologic oncologists should spend at least 3–6 months in high-volume centers and get a competency certificate.

### 2.2.2 | Practical clinical gynecologic oncology training

The training of academic and highly specialized gynecologic oncologists is resource intense and the finite number of centers in India where this can be done makes it impractical to meet the country's huge need for a gynecologic cancer care workforce. Currently in India, fellowship programs at a larger number of sites are being conducted under the aegis of the Association of Gynaecologic Oncologists of India (AGOI), as well as some universities that offer a focused training program conducted over 12–18 months. These are

open to obstetricians and gynecologists and are offered at comprehensive cancer centers that are outside of the subspecialty graduate degree program. The aim is to provide a fundamental knowledge of the subject and skills in the common clinical and surgical management of gynecologic cancers. The training includes screening and early detection, management of preinvasive lesions, safe simple and radical hysterectomies, management of adnexal masses with adequate staging, survivorship, and basic palliative care. These professionals then mainly work in city hospitals and smaller towns that are not served by qualified gynecologic oncologists. This supports timely diagnosis and management of common cancers and provides a network for prompt referral of women with more complex cases. Further skill development can be done through continuing medical education (CME) programs and surgical workshops.

### 2.2.3 | Observations

It is important to understand that the development of gynecologic oncology as a subspecialty cannot be independent of the development of a robust health infrastructure. Patients need access to radiation and chemotherapy facilities as well as well-equipped surgical infrastructure. In the absence of well-functioning blood banks and perioperative care, it would be prudent to offer radiation instead of radical surgery in cervical cancer and neoadjuvant chemotherapy instead of primary debulking surgery in advanced ovarian cancer.

Efforts are ongoing to enhance educational opportunities beyond fellowship training and several organizational bodies have taken the forefront to provide a platform for continuing education in the form of conferences, workshops, and CME meetings. The AGOI, the national body of gynecologic oncologists with nearly 1400 members, plays a leading role in academic activities.<sup>15</sup> In addition, there are state chapters and the oncology subcommittee of the Federation of Obstetrical and Gynaecological Societies of India (FOGSI); the National Cancer Grid (NCG) also provides a forum for discussion of cases and a virtual tumor board. One promising initiative leverages mHealth to capture patient data and link frontline health workers at the primary health center or community health center level with tertiary care centers for appropriate referral and treatment.

The ultimate goal is to provide qualified and skilled gynecologic cancer care in well-equipped facilities uniformly spread over all geographic regions of the country, but until that time a two-tier approach to training as described would be necessary. It would also be useful to establish or identify a few institutions of excellence that can become nodal points for research and clinical trials, as well as provide training in advanced surgical procedures.

### 3 | CONCLUSIONS

Women in low-resource centers face many barriers to obtain care for gynecologic cancers. Reaching these women will require a comprehensive multidisciplinary approach that addresses all aspects of cancer care, including infrastructure. An important first step is to train and support gynecologic oncologists at the sites where they are most needed and where they can most effectively treat and advocate for women with gynecologic cancers. While there may be no perfect solution, we present two models for training that have proved highly effective in preparing gynecologic oncologists to utilize local resources to best treat women with the greatest needs. We encourage further support of these efforts through philanthropy, volunteerism, and through collaboration with allied professionals and societies.

#### AUTHOR CONTRIBUTIONS

TR and SPS conceived and drafted the manuscript together. MQ, KS, JN, and LC participated in the conception, organization, and editing of the manuscript.

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#### CONFLICT OF INTEREST

The authors have no conflicts of interest.

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