



Global Forum of Cancer Surgeons: Perspectives on Barriers to Surgical Care for Cancer Patients and Potential Solutions

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The global cancer burden continues to rise at an alarming rate.¹ It is estimated that there were 15.2 million new cancer cases and 8.8 cancer-related deaths in 2015.¹ It is predicted that by the year 2035, there will be 23.9 million new cancer cases and 14.6 million cancer-related deaths.¹

Cancer is currently the second-leading cause of death worldwide, second only to cardiovascular disease.² Globally, deaths related to cancer increased by 45% between 1990 and 2013.³ In a recent update, the Global Burden of Disease study

group noted that cancer-related mortality increased by 17% between 2006 and 2016.⁴ It is likely that at this rate cancer can become the leading cause of death in the near future.

Surgery plays a vital role in the treatment paradigm for cancer patients. The Lancet oncology commission on global cancer surgery predicted that more than 80% of people diagnosed with cancer will need a surgical procedure.⁵ It is estimated that by 2030, 45 million additional surgical procedures will be needed to treat patients diagnosed with cancer.⁵ Despite this rising need, only 25% of the patients worldwide will receive safe, timely, affordable, and high-quality surgical care.⁵ The majority of cancer patients in the low- to middle-income countries will be the most affected due to these disparities in surgical care for cancer patients.⁵ The inability to access timely and safe surgical care for cancer patients can lead to a cumulative gross domestic product loss of US \$6.2 trillion by 2030.

Multiple factors contribute to the inadequacy and inequity in surgical care for cancer patients globally. Several entities, such as the Lancet Oncology Commission and the World Health Organization, are actively working

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TABLE 1 Barriers to providing safe, timely and optimal surgical cancer care in the arena of education

	Brazil	China	Egypt	India	Israel	Japan	Mexico	South Korea
1	Surgical oncology is not a recognized specialty until 2017	No standardized training organization	No standardized training organization	Limited number of training positions	Long duration of medical education	Very short duration of surgical training	Duration of surgical oncology training (7 years)	Duration of surgical oncology training
2	Expensive premedical education	Surgical oncology is not a recognized specialty	Lack of preparatory undergraduate courses for surgical oncology	Expensive premedical education	No available surgical oncology training	No recognized surgical oncology training	Continuing medical education	Not opted by Medical students
3	Oncology discipline is optional		Short duration of specialized training during surgical residency	Long duration of training to be a surgical oncologist	Lack of awareness in general public	Inadequate teaching to residents	Deficient medical education support by government	Other health care departments with better quality of life
4	Poor general public knowledge of surgical importance in cancer care		Limited number of accredited centers to provide education, training and certification	Inadequate pay during the training period			Lack of sponsored medical courses	Other health care departments with higher pay
5			Inadequate awareness and financial constraints					

towards reducing the cancer burden and to improve surgical care for cancer patients.^{5,6} The Global Forum of Cancer Surgeons (GFCS) was formed in 2017 under the auspices of the Society of Surgical Oncology and several other surgical oncology societies across the world.⁷ The GFCS has a similar purpose of addressing disparities and improving surgical care for cancer patients worldwide.^{7,8} “The mission of the GFCS is to provide a voice for cancer surgeons to improve surgical care for cancer patients through clinical care, education, research, outreach, advocacy, and leadership on the global stage.”⁸ The cancer burden from the countries currently represented in the GFCS accounts for the majority of the global cancer burden (77.5% of the new cancer cases and 75.7% of cancer-related mortality).⁸

At its inaugural meeting in 2017, the members of the GFCS proposed an initial brief qualitative pilot survey (Supplemental Fig. 1) to explore the barriers to surgical care for cancer patients and identify potential solutions. The survey was distributed to the surgical oncology leaders from all eight countries outside of the United States, Canada, and Europe. These countries included: Brazil, China, Egypt, India, Israel, Japan, Mexico, and South Korea. We received responses from all eight countries representing diverse regions of the world with a response rate of 100%. The perceived barriers to providing optimal surgical care for cancer patients for all domains in their respective countries are outlined in Tables 1, 2, 3 and 4.

The perceived barriers to providing adequate surgical care for cancer patients in the arena of education are highlighted in Table 1. One of the major barriers appears to be the lack of standardized training for surgical oncologists. The lack of standardization in content and length of training for surgical oncology can be alleviated by utilizing the curriculum jointly developed by the Society of Surgical Oncology and the European Society of Surgical Oncology.^{9,10} This modular curriculum with modifications tailored to individual countries can serve as a foundational scaffolding to standardize surgical oncology training and thereby build a sustainable surgical oncology workforce.

The perceived barriers relating to the domain of clinical care are highlighted in Table 2. The major barriers appear to be related to the lack of resources and is similar across most of the countries. This lack of resources results in downstream multiplication of inadequacies in many avenues ranging from: lack of specialized cancer centers, insufficient number of specialized professionals, inadequate resources to perform optimal staging, inability to develop or follow evidence-based guidelines and the issues related to urban versus rural disparities.

The perceived barriers in the arena of research are highlighted in Table 3. The lack of a research curriculum to teach and acquaint surgical oncology trainees and practicing physicians with the fundamental basics of research was noted as a major barrier. The global curriculum in research literacy jointly developed by the

TABLE 2 Barriers to providing safe, timely, and optimal surgical cancer care in the arena of *clinical care*

	Brazil	China	Egypt	India	Israel	Japan	Mexico	South Korea
1	Deficiency in resources for appropriate care	Irregularities in application of guidelines nation wide	Sub-optimal health care supporting staff standards	Lack of specialized cancer surgeons in public hospitals	Disparities in urban and rural health care resources	Differences in quality of care among high and low volume centers	Limited specialized cancer centers	Centralization of patients to high volume hospitals
2	Deficiency in cancer staging resources	Variable quality of surgeons' secondary to quality of training	Limited work force in cancer centers	Expensive high quality health care	Expensive private/high quality health care	Deficit in clinicians with specialty training	No current population based cancer registry	Low quality outpatient clinic secondary to high volume
3	Limited specialized cancer centers	Differences in insurance coverage nation wide	Complexity and fragmentation of health care system	Lack of public awareness	Inadequate government funding for health care	Deficiency in trained medical personnel and specialized medical equipment	Insufficient cancer surveillance	Surgical oncology is less preferred specialty, hence deficiency of high quality doctors
4	Poor quality and large volume in public health system	Deficiencies in availability and accessibility of medical resources.	Concentration of cancer centers and doctors in urban areas	Limited resources for staging and institutional care		Lack of insurance coverage for optimal medical equipment		Delayed care secondary to long waiting list of patients
5	Expensive private health care system		Disparities in health care system guidelines			Delayed approvals of new drugs		

Society of Surgical Oncology and European Society of Surgical Oncology can be implemented to address this barrier.^{11,12} The inability to publish or present their research projects was noted to discourage researchers. The Global Poster session at the annual cancer symposium of the Society of Surgical Oncology provides a forum for young surgical oncologists to display their research projects.¹³ The Chinese Society of Clinical Oncology provides a similar opportunity for researchers to present their projects at their annual meeting.^{14,15}

The perceived barriers to providing safe, timely and optimal surgical care to cancer patients in the arena of workforce are highlighted in Table 4. Barring Israel, all the other countries under discussion in this context rank within the top 30 most populous countries in the world with 6 countries (South Korea is currently ranked at 27) within the top 14. Not surprisingly, all the countries reported large volumes of patient population and inadequate number of qualified health care personnel being the cause of suboptimal surgical cancer care delivery. Inadequate pay for the amount of work along with long work hours, large volume load, and poor working environment were the other reported factors.

The surgical oncology leaders from various countries were asked to outline some broad solutions to the identified barriers (Table 5). Although each country had their own

areas of emphasis, we noted several overlapping solutions. In countries, such as Brazil, China, Japan, and Mexico, leaders felt that a multidisciplinary approach based on clinical guidelines needed to be promoted. Many countries highlighted the benefits of international observerships and educational opportunities that permit the bidirectional transfer of best educational, clinical, and research practices. The Society of Surgical Oncology, European Society of Surgical Oncology, Brazilian Society of Surgical Oncology, Japanese Society of Gastrointestinal Surgery, Korean Society of Surgical Oncology, and several other organizations already provide such overseas observership opportunities that can be of significant value for bidirectional transfer of knowledge and best practices.^{16–18} The International Career Development Exchange (ICDE) provides funding and infrastructure for candidates from other countries to attend the annual cancer symposium of the Society of Surgical Oncology and also visit premier Surgical Oncology Institutions in the United States.¹⁶ The European Society of Surgical Oncology offers trainees in surgical oncology the opportunity to visit a specialist centre outside of their native country.¹⁷ Similarly, the Brazilian Society of Surgical Oncology provides funding and administrative support for young surgical oncologists to attend their annual meeting.¹⁸ Several other societies, such as the Indian Association of Surgical Oncology, are in the

TABLE 3 Barriers to providing safe, timely, and optimal surgical cancer care in the arena of *research*

	Brazil	China	Egypt	India	Israel	Japan	Mexico	South Korea
1	Vigorous scrutiny for approval of research	Lack of nationalized cancer registry system	Limited funding for research activities and expensive research equipment	Limited funding for research related activities	Limited financial resources to fund research	Relatively disinterested young generation doctors	Disparities in human, economic and technological resource availability	Difficulty in passing the Ministry of Food and Drug safety for new drugs/equipment
2	Severe delay in approval by regulatory agencies	Lack of national cancer database	Limited animal and research labs	Improper and unreliable reporting of research data	Lack of National cancer registry	Limited financial support for research activities	Difference in pay during clinical vs research activities	High clinical work burden in addition to research activities
3	Difficulty in publishing internationally by Brazilian authors	Limited funding for clinical research	Deficiencies in technical support		Lack of national guidelines for cancer care	Deficit in supportive staff for clinical research activities		
4	Requirement of Brazilian researchers participation for BSSO publication		No mandatory clinical research in training curriculum			Surgical training preferred over basic research		
5			Difficulties in publishing and recognition					

process of developing new observerships. These multiple observerships not only provide some amount of funding to defray the costs but also serve as major platforms for collaborations to improve surgical care for cancer patients globally.

The survey was distributed to the elected leaders of the various surgical oncology societies of the world. The results are the perceptions of the leaders and may not be reflective of the perceptions of their entire respective countries and do not include the perceptions of the

members of these societies. In addition, it takes into account the opinions of several other surgical disciplines that perform cancer surgery. The survey was distributed to eight member countries of the GFCS, which account for a large population of the world. Several other countries not within the GFCS but with a rising cancer burden and surgical inequities in cancer care were not included in the survey. Finally, this project was designed as a pilot qualitative study. As a result, the paper does not propose to identify solutions to all barriers or provide a quantifiable

TABLE 4 Barriers to providing safe, timely, and optimal surgical cancer care in the arena of *work force*

	Brazil	China	Egypt	India	Israel	Japan	Mexico	South Korea
1	Large volume	Increasing brain drain	Shortage of qualified, dedicated personnel	Limited qualified surgical oncologists	No surgical oncology fellowship available	Deficient skilled doctors and supporting staff	Fragmentation of health care system	Not a preferred specialty due to poor quality of life
2	Insufficient pay	Low salary, high work load	Inadequate paramedical staff	Prefer to work in private setting for high pay	Extremely difficult recruitment to foreign fellowships	Increasing medicolegal allegations	Difficulties in homogenizing guidelines	Less pay and longer work hours
3	Low investment in logistic, human resources and infrastructure	Occupational risk involving patient-doctor relationships	Low pay to surgeons and supportive staff		Relatively low case load to initiate surgical oncology training	Poor work environment strongly reducing motivation to work	Difficulties in obtaining technical and pharmacological resources	Less resources for a surgical oncologist to practice cancer care
4		Less preferred profession	Poor work environment			Desire to work in urban areas		

TABLE 5 Some broad solutions to the barriers mentioned in Tables 1, 2, 3 and 4

	Brazil	China	Egypt	India	Israel	Japan	Mexico	South Korea
1	Promoting the importance of cancer surgery awareness	Establish and application of clinical practice guidelines	Hiring qualified medical professionals in all specialties	Hiring qualified oncologists in tertiary hospitals and teaching hospitals	Increasing opportunities for training at international level	Increasing surgical oncology job benefits and supportive staff	Standardize surgical and oncological education	Limiting health care tourism to country's urban areas
2	Increasing international observership opportunities		Scaling up cancer registry	Standardizing oncology training	Providing sponsorship to access training programs	Reforming educational system for surgery	Implementing national guidelines and recommendations	Promoting educational resources for rural surgeons
3	Making oncology a mandatory discipline in medical school		Increasing resources in prevention, surveillance and research areas	Organizing CME's to increase awareness at rural level	Increasing awareness in peripheral hospitals	Promoting Multidisciplinary approach	Lowering the cost of care for cancer patients	Providing health care professionals with benefits for their work
4	Promoting multidisciplinary approach in cancer treatment			Increasing insurance coverage for cancer patients	Qualified oncologists should lead peripheral hospitals	Increasing incentives to work in rural environment		
5	Promoting cancer registry system and cancer research					Promoting public cancer awareness		

estimate of the burden for those barriers. It is hoped that in the future a more comprehensive survey can be distributed not to only the leaders but also to the broader membership of the partner societies. It would be beneficial to obtain the opinions of not only fellowship-trained surgical oncologists but also general surgeons and surgeons from various training pathways who still perform a major share of cancer surgery across the world. Finally, we hope the comprehensive survey can capture data from all parts of the world with diverse representation from various countries not included in the current study.

In summary, the Global Forum of Cancer Surgeons appears to be a stable body of cancer surgeons from across the world that can work well together and speak as one cohesive voice to address inequities in surgical care for cancer patients globally. The success of the initial qualitative pilot survey demonstrates that the Global Forum of Cancer Surgeons has the potential to play a larger role on the global stage of cancer surgery. The initial qualitative pilot survey identified barriers to surgical care with multiple common themes for the various surveyed countries. This commonality can help to build synergistic solutions that can be cost-effective when modified and implemented on the global stage. Several of the barriers will need new

solutions but for some, many solutions offered by the various surgical oncology societies across the world and within the GFCS are already in existence. The Global Forum of Cancer Surgeons has been instrumental in bringing these multiple surgical oncology societies together to reap the benefits of the collaborative work between the societies. It is hoped that the Global Forum of Cancer Surgeons will continue to grow and remain a viable body to promote safe, timely, accessible and high-quality surgical care for cancer patients globally.

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