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Making a world of difference in cancer care

Thinking Differently in Global Health in Oncology Using a Diagonal Approach: Harnessing Similarities, Improving Education, and Empowering an Alternative Oncology Workforce

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OVERVIEW

Cancer is a leading global cause of death, and diverse and minority populations suffer worse outcomes compared with white people from Western societies. Within the United States, African Americans and other blacks, Hispanics, Asians, and American Indians have lower cancer survival rates than whites. In the rest of the world, those from low- and middle-income countries have the greatest disparities, but even those from non-Western high-income countries such as Oman and the United Arab Emirates are diagnosed with cancer at later stages and suffer increased mortality. Although considerable differences exist among these populations, similarities and synergies are also apparent. Challenges can be very similar in reaching these populations effectively for cancer control to improve outcomes, and innovative strategies are needed to effectively make change. In this review, the authors discuss new approaches to the prevention and early detection of cancer as well as the implementation of programs in global oncology and put in evidence cultural similarities and challenges of different populations, highlighting strategies to improve cancer survival and quality care around the world through innovations in training and education, empowerment of an alternative workforce, and a diagonal approach to cancer care using case studies drawn from the authors' work and experience.

Cancer is a leading cause of death globally, and diverse and minority populations suffer worse outcomes compared with white people from Western societies.¹ Within the United States, African Americans and other blacks, Hispanics, Asians, and American Indians have lower cancer survival rates than whites.² In the rest of the world, those from low- and middle-income countries have the greatest disparities, but even those from non-Western high-income countries such as Oman and the United Arab Emirates are diagnosed with cancer at later stages and suffer increased mortality.³ Although considerable differences exist among these populations, similarities and synergies are also apparent. Challenges can be very similar in reaching these populations effectively for cancer control to improve outcomes, and innovative strategies are needed to effectively make change.

The following three sections that will be discussed are: Alternative Approaches to Prevention, Early Detection, and Implementation in Global Health. This review, and its accompanying presentations given at the 2017 ASCO Annual

Meeting, will discuss cultural similarities and challenges of different populations and highlight strategies for improving cancer survival and quality care around the world through innovations in training and education, empowering an alternative oncology workforce, and a diagonal approach to cancer care using case studies drawn from the authors' work and experience.

CULTURAL SIMILARITIES, CHALLENGES, AND INNOVATIVE STRATEGIES FOR CHANGE: AN AMERICAN INDIAN AND MIDDLE EASTERN EXAMPLE

When working with any population, more similarities than differences exist. Overall, people strive for human connectedness, happiness, and quality of life. The family is the core of all societies and holds a special meaning for most people around the globe.⁴ The value of interconnected generations is a component of the family focus.⁵ Aside from some genetic and environmental factors, humans are also susceptible to

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the same diseases, cancer being one of the most common and one of the deadliest.

Among the cancer professional world, similarities also exist. Doctors, nurses, and other professionals strive for a cure when possible, rely on palliative care to manage deleterious symptoms that occur along the cancer trajectory, and hope for the best possible outcomes for the given population. When working and interacting with professionals from diverse populations, an immediate connection occurs based on similar experiences and a deep understanding and respect for the common ground on which they work.

Both the personal and professional similarities should be embraced when working with any diverse culture; yet, it is important to recognize the differences and the challenges that affect cancer care and outcomes. Fears and attitudes about cancer, spiritual and religious customs, and gaps within the health care systems are some of the differences.

Cancer Beliefs

Fear of cancer, avoidance of discussing illness, use of traditional medicine, and the importance of spirituality are commonalities among some American Indian and Middle Eastern people (and many others around the world) and are discussed briefly in this section. First, fear of cancer can be related to fatalism, in that low cancer survival rates reinforce the belief that cancer is not curable. Superstition is another part of the fear; some believe that even saying the word “cancer” can cause it to happen or, as one American Indian medicine man stated, “bring bad medicine to his people.” For Middle Eastern cultures, not disclosing a cancer diagnosis is precipitated by the fear that it will have a negative impact on the patient.⁶ Overall, cancer can be considered fearful and a cultural taboo in many cultures, making education and discussing the topic a challenge.⁷ Use of traditional medicine is also common among American Indian and Middle Eastern cultures.⁸ This topic commonly surfaces at professional cancer meetings. Finally, spirituality and/or religion are closely woven into the lives of American Indians and many from Middle Eastern and northeast

African nations.⁹ Meetings commonly open in prayer, which is different from most Western cultures, and spirituality and religion are openly discussed and integrated into care. Silbermann’s book, *Cancer Care in Countries and Societies in Transition*, highlights many beliefs commonly shared in low- and middle-income countries and countries experiencing transitions in cancer care.⁹

Innovative Educational Strategies

Diverse cultural groups require innovative strategies that address cancer care, from diagnosis, through treatment, survivorship, and end-of-life care. Whether the audience is a patient or health care professional, teaching strategies should incorporate cultural aspects and engage the learners from their own personal lens and experiences. Although education is necessary to increase knowledge about cancer care and build capacity in any region, those working with global populations are often challenged with how to best present information and how to engage participants as active learners and change agents. One systematic review found that a combination of didactic and experiential teaching methods is effective in improving attitudes toward care of the dying.¹⁰ Another systematic review examined effective methods of teaching communication skills in dementia care and found a combination of didactic methods, hands-on training, group discussions, and role-play improved communication skills.¹¹ A third systematic review explored training methods for communication strategies for cancer care professionals and found that programs delivered over a longer period of time were most effective, and a combination of didactic education, peer feedback, and small group participation was the best teaching strategy.¹² The limitation of these findings is that the majority of studies were conducted in resource-rich countries, and little is known about which methods work well in low- and middle-income countries.

Didactic Education

Didactic education is the current foundation of most learning activities. Health care professionals in particular require knowledge transfer on the management of cancer throughout the disease trajectory, strategies for pain and symptom management, ethics, end-of-life care, communication strategies, and evidence-based practice and research in cancer palliative care. This traditional didactic approach, however, has limitations. Little time is often left for group interaction and discussion, and patients and health care professionals alike may not be able to incorporate their cultural beliefs and customs into the plan of care. Although didactic education is important for some content, this author has found successful out-of-the-box strategies to address cancer care in American Indians and other diverse cultures.

Liberating Structures

Liberating structures have been used extensively in the Middle East and northeast Africa to teach health care professionals about cancer and palliative care. These interactive methods involve every participant, unleash creativity,

KEY POINTS

- **Cancer is a major health problem worldwide, and there are disparities across and within nations and regions.**
- **Cultural similarities should be embraced and educational approaches adapted for adequate reach and implementation.**
- **An alternative workforce, composed of nononcologists, can be trained and monitored successfully and may provide care in areas of desperate need.**
- **A diagonal approach to global health in oncology overcomes the barriers between vertical (disease-specific) and horizontal (systemic) approaches by making full use of potential synergies between different programs and offers the opportunity to implement individual-centered, instead of disease-focused, approaches.**

and engage in group problem-solving to collaboratively achieve better results than didactic education alone.¹³ This upside-down approach to education does not assume that the teacher has all of the knowledge, but rather assumes that solutions exist within the participants and that by tapping into group think, cultural and community expertise can be incorporated into the learning process. Some examples of successful liberating structures used by this author (J. M. Brant) in the Middle East are included in Table 1.

Community Events

Although liberating structures can be used for patient education, other community event approaches may be more effective. Cancer walks or relays are one example of a community event that can engage patients, families, and health care professionals and build a sense of comradery among community members. Some of the successful events used by this author (J. M. Brant) for American Indians are included in Table 2. Although most events have focused on women's cancers, the events can be modified for men. Bringing food to the event is an important cultural tradition among American Indians and most cultures and can draw community members to the event. Examples of successful programs are well documented in the literature.¹⁴⁻¹⁶

Although working with diverse cultures may be challenging, the rewards are often immeasurable. Those of us who have had the privilege to work with patients and/or health care professionals from diverse cultures often think we go to speak and end up listening. We go to teach and end up learning.

EMPOWERING AN ALTERNATIVE ONCOLOGY WORKFORCE: AN EXAMPLE FROM INDIA

A major challenge in cancer care is access to treatment. Patients suspected of having cancer, or suffering from cancer, must have a medical care provider close to their residence. In India, the smallest administrative region is a district, which has a hierarchal system of primary health centers, block level health centers, and a district hospital that serves as the largest medical hub for the area. The low- and lower middle-income groups that form the majority of the population of India use these facilities for all of their health care needs. All administrative and government machinery providing support to these various schemes is located at district headquarters. District hospitals are multispecialty units that headquarter all programs run in the state/country mandated by the World Health Organization and various international commitments like programs for vaccination, mother and child care, tuberculosis, malaria, and others.

One of the coauthors of this paper (D. Pendharkar) was the leader for a project aimed at decentralizing cancer care to the peripheral level through the development of an innovative health care delivery model.¹⁷ The issues in focus included the extension of cancer care to rural areas using existing human resources and infrastructure. The objective was to create a point of contact for cancer and a nodal cancer unit in each of these district hospitals (Fig. 1).

The model builds on similar global practices to address access challenges. In Australia, the Townsville Cancer Center, a tertiary cancer center in North Queensland, Australia, provides chemotherapy services to patients from surrounding small rural towns using the Queensland Remote Chemotherapy Supervision model. Rural-based generalist doctors and nurses administer selected chemotherapy regimens to patients in remote units under the supervision of Townsville Cancer Center-based medical oncologists and chemotherapy-competent nurses through videoconferencing.¹⁸ Project ECHO has also demonstrated the viability of a telemedicine-based solution to hepatitis C control and mitigation by linking community care providers with specialist care teams at academic medical centers to treat patients who require complex specialty care via basic video-conferencing technology.¹⁹

Methodology

Government medical officers and qualified generalist physicians who typically perform all multipurpose duties were selected to undergo training at a cancer center. Two nursing personnel were also trained in various aspects of chemotherapy handling and administration.

The 1-month training included the basics of oncology, detection, diagnosis, treatment, chemotherapy administration and side effect management, and palliative care. Special emphasis was placed on communication and counseling skills pertinent to cancer. The physician was made to understand the role of documentation and various endpoints in oncology. The training was hospital-based and involved daily wards rounds, participation in outpatient clinics observing work of chemotherapy day care, and so on. The training also included a large motivational component on the importance of the role of the physician. Many of the physicians were evaluated by an independent board of oncologists, and their training was found to be adequate to initiate cancer care services at a district hospital. After the training, physicians returned to their respective district hospitals to begin seeing and registering patients with cancer. Patient cases were discussed either through WhatsApp (mobile phone-based chat), an electronic medical record software, or on the phone with a senior oncologist to finalize a course of action and treatment plan. Every evaluation of a new patient served as continued training and learning, with knowledge being further strengthened via regular continuing medical education events and participation in national and international meetings. This constant continuation of training helped consistently improve physicians' skills.

An additional component of establishing local systems and empowerment was done through the organization of local cancer counseling camps. The camps took place in district hospitals, and local patients were invited and encouraged to participate. Patients were examined and counseled. The local physician was briefed on the care of the patients who increased his/her confidence in handling the case. These types of activities form an important part of continuing education for the physician in charge of oncology care and also serves to build patients' trust and confidence in the system.

TABLE 1. Examples of Successful Liberating Structures Used for Didactic Purposes

Liberating Structure	Rationale for Use	Steps
Impromptu networking Used for participant introductions	Get people up and moving	Everyone gets up and finds someone they do not know
	Acquaint with others you do not know	Pairs
	Keep them thinking about the week	Introduce one another
		Two questions: (1) What do you hope to get from this workshop? (2) What do you hope to contribute to this workshop? 2 min per person, three rounds
Conversation café To discuss opportunities and challenges of cancer screening, early detection, palliative care, or any other cancer-related issue	Engage everyone in making sense of profound challenges	Get into small groups
	Encourages everyone to express themselves	A talking object is passed from person to person
	Distributes conversation	Round 1: each person shares one strength and one challenge in their setting in regards to the topic, 1 minute per person Round 2: reflections after listening to everyone, 1 minute per person Round 3: open conversation 15 minutes without object Round 4: takeaways, 1 minute per person
Open space To develop a cancer or palliative care quality-improvement project	Participants control the agenda	Map of room drawn and taped to wall
	Allows individuals to begin teaming with others in their area of interest	Blank sticky notes in middle of room
	Allows leaders to emerge	Participants invited to propose a topic to discuss with others: write it on a sticky note and stake a place in the room (e.g., curriculum development, early breast cancer detection, pain)
	Everyone who joins the group cares about the challenge at hand	Once four to five topics proposed, individuals can wander to a group Lead must stay with group but others can wander in and out: bee (pollenates and moves ideas) or butterfly (goes group to group for various interests)
Fishbowl To illustrate successes and challenges of establishing cancer or palliative care services	Share knowledge gained from experience, because they have minimal experience with palliative care, we must be the experts	Three to four of us in the inner circle to talk about the good, bad, and ugly of establishing cancer or palliative care in the hospital and community
	Uses expertise of those who have established a palliative care program	Converse and share stories without engaging outer circle for 10–15 minutes
	Allows participants to ask questions and engage	Outer circle gets together in groups of four to list three questions, or can just have open questions
	Participants can jot down takeaways for their palliative care plans	Inner circle answers questions and interacts with outer circle Allow one to two empty seats for others to enter in and ask questions

Continued

TABLE 1. Examples of Successful Liberating Structures Used for Didactic Purposes (Cont'd)

Liberating Structure	Rationale for Use	Steps
Improv To demonstrate positive and negative communication skills	Everyone included as players or observers	Volunteers recruited to be actors (patient, family, nurse, physician); they write the scenario (e.g., patient has high anxiety [but cannot be told she has cancer] but daughter trying to support; physician/nurse talks to the Ministry of Health about opioid availability)
	Only so much about communication can be taught in a textbook; it has to be role modeled	Play out the scene according to cultural context
	Allows them to create their own context for the situation, and our team responds/communicates	Allow others to respond as to what went well and what could have been different
1-2-4-ALL Used to discuss case studies	Distributes group participation	Participants get into their breakout groups.
	Allows for individual reflection, small group interaction, and then a larger exchange of ideas	Each group is given a case study
		Individuals reflect on the study for 5 minutes and write down thoughts
		Groups of two share thoughts
		Groups of four, or could convene the whole group to share thoughts and come up with a plan
	Plan is written on the flip chart	
	ALL: each group presents their case and plan to the larger group	
Celebrity interviews To integrate spiritual and cultural knowledge and experiences into cancer and palliative care; engages community leaders as experts	Explores big challenges with those knowledgeable in the area	One person from each country chosen by us ahead of time; option: we give them questions the night before
	Allows participant leaders to share experiences on integrating spirituality into care	The three celebrities are seated in chairs at the front of the room
	Relies on their beliefs and customs	Interviewer introduces topic to be discussed and conducts the interviews: (1) What inspired you in this work? (2) How do you manage stress in your work? (3) What role does spirituality have in your work? (4) How do you integrate spirituality into your patient care?
	Stories emerge that bring concepts to life	Audience asks questions after the interviews

Monitoring of the program is being done by the office of the commissioner of health from the administrative side and by an oncologist from the medical side, and routine census is being generated. Patient profiles, documents, and materials related to care are being captured and stored. Data are being collected related to various aspects. Administrative reforms were undertaken to improve the storage, movement, and supply chain of anticancer drugs, and drug formularies were appropriately amended.

Program Execution and Outcome

The program was launched in February 2014 in the state of Madhya Pradesh and later initiated by the state governments of Odisha, Himachal Pradesh, and Uttar Pradesh. Physicians from 69 districts and nurses from 58 districts have completed training in various batches. The training was strengthened by six continuing medical education events related to early diagnosis, treatment, palliative care, and participation in national and international meetings by a few physicians.

In total, 63 district hospitals have started offering services (51 out of 51 districts of Madhya Pradesh, 7 out of 30 districts of Odisha, and 5 out of 12 districts of Himachal Pradesh). These districts are spread over an area of 374,420 km² (Madhya Pradesh, 308,245 km²; Himachal Pradesh, 14,283 km²; and Odisha, 51,892 km²) and cover a population of approximately 90 million (population: Madhya Pradesh, 75 million; Himachal Pradesh, 4 million; and Odisha, 11.5 million). The rural population constitutes the majority (> 80%) and has a very high number of tribal and socially challenged families (up to 90% in several districts).

Three different WhatsApp groups, mentored by an oncology specialist, have been formed. Cloud-based electronic medical records, to store data electronically, have also been initiated, and physicians are being encouraged to capture data. Registration and physical data records with photocopies of the medical documents are being carried by the patient and are also kept in hospital records.

TABLE 2. Examples of Community Events

Event	Description
Pink and blue bingo nights	Separate bingo events for men and women. The evening begins with a circle conversation about breast, cervical, colorectal, and prostate cancer screening. Fecal occult blood kits are distributed to those eligible for screening. Exams can be scheduled during the meeting. Bingo follows the cancer education component.
Cancer awareness poster/photography contests	This event can engage school-aged children and adolescents in cancer awareness. The community can sponsor a poster or photography contest that features healthy behaviors to prevent cancer. Winners are awarded prizes.
Generations of wellness photos	Women of all generations can attend mammography screening together and have a professional photo taken following the mammogram. Children and those not screened can be welcome to attend. The photo is printed on site and framed for the grandmother and her children and grandchildren.
Cup art	While waiting for a mammogram or cervical cancer–screening test, women can artistically paint a mug, which is later fired in a kiln and given to the woman at a later date. An educator is present to provide information about cancer prevention and early detection for both men and women. Women are encouraged to schedule and/or bring their husbands to the clinic for cancer screening.
Dress making/beading	Ceremonial dance is important to American Indians. Women can gather to work on competition dresses and complete beadwork while a guest speaker can discuss cancer screening.
“Tough Enough to Wear Pink”	Rodeo or athletic event that encourages both men and women to wear pink in honor of breast cancer awareness month.

More than 15,000 patients have been registered and have used various services. The number of new patients being registered is increasing regularly and per month varies from district to district in the range of 5 to 30. There are more than 400 outpatient visits per month in the best performing district. The number of inpatients is also increasing. The inpatient services are being used for palliative and supportive care as well.

When a patient arrives at a unit, he/she is seen by the physician, and his/her histologic verification is confirmed. The patient is diagnosed through biopsy and appropriately staged. Diagnostic services, if not available in the hospital, are outsourced. After evaluation, the patient is brought to the group tumor board. Once the board reaches a decision, the patient is informed and counseled on the decided course of action. Chemotherapy, if needed, is started locally and offered at no cost. Surgery and radiotherapy services of the nearest cancer centers are used (Fig. 2).

All centers have started performing chemotherapy services as per standard guidelines. The number of chemotherapy sessions ranges from 5 to 150 per month in different hospitals. All classes of drugs are being used, including those that are emetogenic or with potential of acute reactions. Initial outcomes suggest standard toxicity levels comparable to any other center. There has been only one case of mortality related to chemotherapy toxicity. Patients in advanced or terminal stages of the disease are receiving proper palliative and end-of-life care in the districts, which has come as a big relief for the families.

These units have begun serving as centers of public education on cancer and are routinely involved in various activities like rallies, public speeches, poster exhibitions, leaflet distributions, etc. Media outlets and other government machinery are being used. The units have also become centers of professional education. One of the centers is being used for hands-on training for physicians and has been incorporated in to training modules. The physicians have been designated by the state as nodal cancer officers.

Patient data are serving as a local cancer registry and enabling the studying and understanding of many small epidemiologic deviations in the districts, revealing quite striking variations in patterns across different districts. One of the best performing districts has registered 1,564 patients (790 [50.5%] males and 774 [49.5%] females). The distribution of most common cancers is listed in Tables 3 and 4, with head and neck cancer being the most common among men and breast cancer among women. Among men, lung is the second most common, whereas among women, it is head and neck cancer. Prostate cancer is commonly reported. In men, upper gastrointestinal malignancies (esophagus and stomach) are also common. In women, incidence of ovarian cancer is high, higher than cervical cancer. Incidence of hematologic malignancies including leukemia, lymphoma, and myeloma is higher.

Multiple satisfaction surveys conducted among patients attending the services have shown complete confidence in

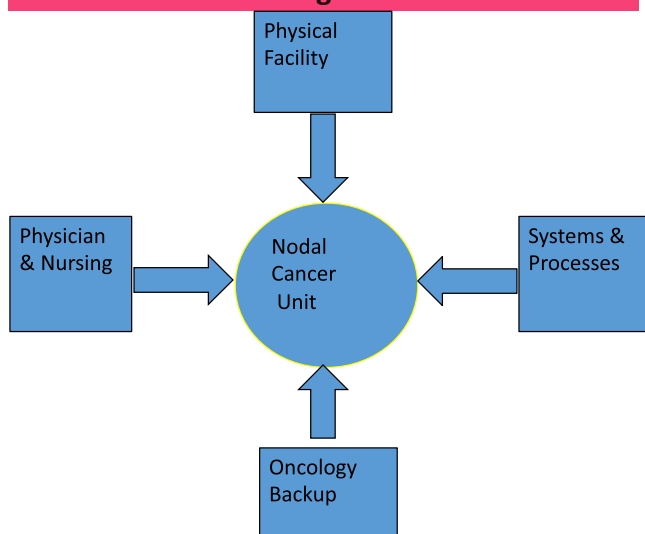
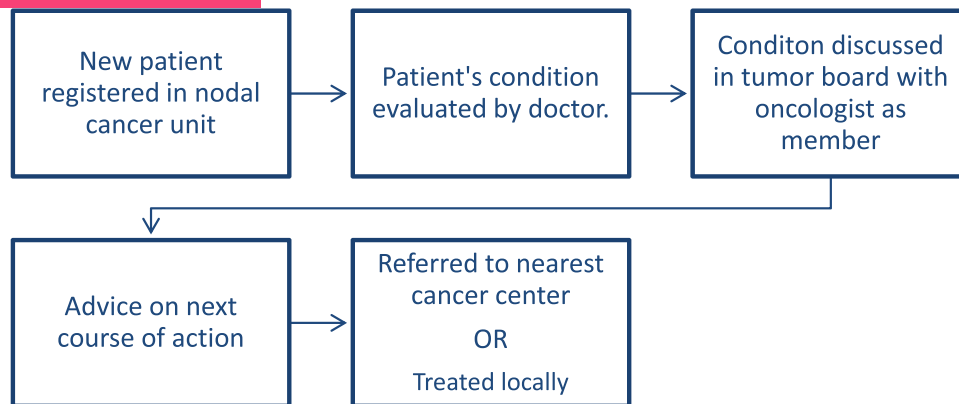
FIGURE 1. Basic Drawing of a Nodal Cancer Unit

FIGURE 2. Process of Patient Care

the system. Many patients have chosen district hospitals over tertiary centers for comparable services.

All countries with a high burden of poor, uneducated, tribal, and socially challenged populations, including India, are facing a huge problem of access to care. The problem is multiplied because of the unavailability of qualified oncology personnel or specialized cancer centers. This health care delivery model tries to find a solution to these issues. Bringing affordable care physically close to the population can only bring a positive change. This can be fit into the diagonal approach to system strengthening. More and more tertiary-level specialized cancer centers have shown confidence in districts and have started referring back local patients for intermediate care. More and more chemotherapy sessions are being performed. This proves the reproducibility of the chemotherapy facility under guidance of oncologists. The model reinforces the need for as well as the acceptance of decentralized specialized care. The program has now been running for more than 3 years and has proven its sustainability. Acceptance by other state governments, after evaluation, shows its administrative and political acceptability. Financial outcomes must be analyzed, but one thing is certain: as government services are free, patients are significantly saving out-of-pocket costs by being locally treated and not having to travel to seek care.

The extension of cancer services via a remote support system improves access to care, especially for those living in rural and underserved areas with complex health problems. With the use of electronic medical record— and

WhatsApp-based interfaces, specialists are able to consult primary care providers like doctors and nurses on the care of patients with cancer, including the administration of complex chemotherapy protocols and management of side effects. Although a toxicity study is currently underway in district hospital settings, more than 3,000 patients have been treated at these centers. Many of these patients had previously been unable to receive chemotherapy because of access barriers. Those who received chemotherapy both at private or tertiary establishments and district hospitals have not reported any major differences in toxicity or clinicians' ability to manage toxicity and adverse effects. The primary goal of patients accessing treatment at the standard of care was met.

The results of this model show that it is an effective way to treat patients with cancer, administer chemotherapy, and provide palliative care in underserved areas. Implementation of this model would allow other states and nations with limited resources to treat greater numbers of patients with cancer than they are currently able to treat.

Epidemiologic data being generated appear to be different from those of the national data registry. For example, the burden of cervical cancer appears to be lower, whereas ovarian cancer is much higher. These differences are important and warrant serious thinking over causative mechanisms. If micromanagement of preventive strategies is to be planned, these data could be very helpful.

The methodology of counseling camps is turning out to be an excellent tool for the education of local physicians,

TABLE 3. Disease Pattern in Male Population (790 Patients)

Type	No. of Patients	Percent
Head and neck	353	44.7
Lung	110	14.1
Hematologic malignancy	96	12.1
Prostate	47	05.9
Upper gastrointestinal	46	05.8
Other	138	17.4

TABLE 4. Disease Pattern in Female Population (774 Patients)

Type	No. of Patients	Percent
Breast	308	39.8
Head and neck	81	10.5
Ovary	69	08.9
Hematologic malignancies	59	07.6
Cervix	41	05.3
Other	216	27.9

helping in setting local systems and processes, building confidence among the local population, and creating wide public awareness on the issue of cancer. Increasing attendance in districts is showing better participation of patients in the care continuum. The point of contact for cancer vis-a-vis nodal cancer units created are helping to drive cancer care more effectively. These physicians are now undertaking and leading all of the following activities: community-based cancer awareness, prevention, education, counseling and appropriate referrals, administering chemotherapy, conducting post-treatment surveillance, and providing palliative care.²⁰

This model offers an alternative solution to managing workforce issues in oncology and establishes a new model of health care delivery in cancer care. The innovative model of empowerment using existing infrastructure and human resources touches on all proposed building blocks of an effective health system as advocated by the World Health Organization and has the potential to expand to other countries with limited resources.²¹ This model can serve as an important role in expansion to universal health care. The empowerment of an alternative oncology workforce using basic level physicians can help solve many global issues of access to cancer care.

A DIAGONAL RESPONSE TO WOMEN'S CANCERS: EXAMPLES FROM THE MEXICAN HEALTH SYSTEM

Effective health systems must encompass the six overlapping components of the cancer care and control continuum by developing integrated programs for primary prevention, early detection, diagnosis, treatment, survivorship, and long-term follow-up and palliation; in other words, mapping and supporting the cancer- and patient-specific journey.²² A diagonal approach is a strategy in which resources for disease-specific intervention priorities, like cancer, are distributed in ways that strengthen the entire health system by driving improvements in systemic areas including human resource development, financing, service provision, drug supply, and quality assurance.²³ This approach overcomes the barriers between vertical (disease-specific) and horizontal (systemic) approaches by making full use of potential synergies between different programs and offers the opportunity to implement person-centered, instead of disease-focused approaches.²⁴

A diagonal approach to cancer care addresses the false dichotomy of prevention versus treatment by strengthening integration of programs along the entire continuum of care. This approach can help to link cancer care and control with many services associated with a broad range of health promotion and treatment activities and reinforce human resources and physical infrastructure in health systems in ways that avoid creation of parallel structures for service delivery.²⁵ A diagonal response also seeks to identify opportunities for optimal use of existing health programs or platforms, including those in other sectors, such as education, to address multiple health priorities and raise public awareness.

In this article, we discuss examples for the case of Mexico and women's cancers. Although Mexico has seen a steady decline in cervical cancer mortality, which peaked at close to 16 per 100,000 women in the late 1980s and then steadily declined to a rate of less than 8 in 2008, breast cancer mortality rose steadily, reaching over 9 per 100,000 by 1995 and has remained relatively stable since.^{26,27}

One example of a diagonal approach is the inclusion of cancer in national health insurance programs. In 2003, Mexico underwent a remarkable health reform that introduced the System of Social Protection in Health that includes a publicly funded health insurance scheme, the Seguro Popular de Salud (Popular Health Insurance), to cover universal access to an essential package of services with financial protection, especially targeting the poor and informal workers.²⁸ As of 2012, the Seguro Popular had affiliated and covered more than 50 million previously uninsured Mexicans and by 2015 further expanded coverage to reach more than 56 million people. The number of covered diseases and interventions has steadily and considerably increased over time, including a growing list of cancers.²⁴ Both breast and cervical cancer treatment are included in Mexico's Seguro Popular since 2005 and 2007, respectively.

Despite the inclusion of breast cancer in Seguro Popular, access to services for early detection of breast cancer remains limited. The 2012 National Health and Nutrition Survey showed that only one in five Mexican women ages 40 to 69 reported having an annual mammogram or breast clinical exam, with large disparities across the poorest and wealthiest quintiles. The majority of hospital cases are detected at later stages, especially in poorer states and municipalities, and mortality rates are high and increasing despite better access to treatment.²⁴

To address the problem of late detection, a number of innovative education, training, and awareness-building interventions have been put in place. A prominent example of the potential for applying a diagonal approach is to integrate interventions for the prevention, early detection, treatment, survivorship, and palliation of women's cancer into antipoverty or maternal and child health programs. For example, the Mexican human development and poverty alleviation program, Oportunidades (now called Prospera), is a social welfare scheme created in 1997 that offers conditional cash transfers to more than 90% of poor, urban, and rural families for the purpose of promoting education, health, and nutrition.²⁴ Women are the recipients of the cash transfers, and as part of the program, participate in a variety of information and educational outreach activities.²⁹

Cervical cancer mortality in Mexico has concentrated among the poorest quintiles despite the fact that this is an easily preventable disease through early detection.²⁶ Oportunidades and now Prospera include a broad range of activities around cervical cancer. Education initiatives for cervical cancer prevention and clinic visit incentives for women to receive the Papanicolaou test have shown a positive impact on increasing the numbers of beneficiary women who are tested for cervical cancer as well as the willingness of

indigenous women to take the test and encourage other women in their communities to do so.²⁹ Furthermore, as of 2015, the HPV vaccination is now included in the Prospera package.

The inclusion of information on breast cancer has been much more difficult to achieve. As part of an effort to increase access to early detection of breast cancer, information was included in manuals distributed through Oportunidades, and the program was encouraged to include education and awareness-building on women's cancers in community workshops and educational outreach.^{26,30} Through Oportunidades, female household heads and community health promoters throughout the country were trained with basic information about breast health and self-examination.²⁴ This work must be evaluated and extended as part of Prospera.

Other breast health awareness initiatives in Mexico have explored and developed various educational innovations to provide breast health education for women in their communities and to ensure a properly trained primary health workforce. A multi-institutional group, spearheaded by the civil society organization *Tómatelo a Pecho, A.C.*, and working with the *Seguro Popular*, the National Institute of Public Health of Mexico, and state governments, was created to train an extensive network of community health workers, nurses, and primary care physicians on early diagnosis and the triaging of high-risk cases with family history.³¹ The group worked with local organizations to develop and implement a "train-the-trainer" program to improve breast cancer knowledge among community health workers, including professional health promoters who then trained nonprofessional community health promoters. The educational strategy was designed using a competency-based approach with an emphasis on student-centered activities, innovative tools, collaborative work, and hands-on problem-solving. Training materials included manuals for physicians and nurses, educational kits and workshop development guides for health promoters, and various recreational games involving the identification of warning signs, breast self-examination techniques, treatment, and return to daily life.³² Participants were surveyed before and after training and demonstrated improvements in understanding of breast cancer

as a problem, understanding of screening, treatment, and insurance coverage issues, and knowledge of breast cancer risk factors, symptoms, and what constitutes a family history of breast cancer.³¹ The training modules have since been and are now available online. More extensive training on survivorship, pain management, and palliative care is now underway.²⁴

These innovative interventions to improve training, education, and awareness constitute a diagonal approach and build on overall efforts to strengthen primary care and link to specialized tertiary treatment options, instead of developing parallel systems for early detection of cancers. These examples deserve rigorous evaluation, as they suggest that diagonal strategies for early detection of breast cancer can be implemented through integration into national insurance and social security schemes and that antipoverty, maternal and child health, sexual and reproductive health, and other programs can serve as platforms for addressing early detection and prevention of cancer.²⁴

CONCLUSION

The case studies presented in this article discuss different strategies for improving cancer management along the entire continuum of care. Although cultural diversity and regional idiosyncrasies across the world will always exist, and context-relevant solutions will always be needed, there are key challenges in cancer care that are universal. Improving global cancer survival requires innovative solutions for the education of both health care professionals and the public. Community empowerment through training of community health promoters and alternative workforces can ensure the uptake and sustainability of improvements in early detection and quality of care. Finally, these solutions need not be cancer specific or developed in parallel silos; health systems can be strengthened through diagonal approaches that find synergies across diseases and build off existing programs or platforms.

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