GLOBAL HEALTH

Making the Best Use of Resources in Global Cancer Care

Juan Gago, MD, MPH[1]; Dinesh Pendharkar, MD, PhD[2]; Chandramauli Tripathi, MBBS[3]; and Ophira Ginsburg, MSc, MD, FRCPC[4,5]

overview

Inequitable access to high-quality cancer control and care remains one of the greatest public health challenges in countries at all resource levels. Core issues include the limited oncology health care workforce and equitable access to affordable (essential) cancer diagnostics, medicines, surgery, systemic therapies, and radiotherapy, compounded by existing social inequalities. To reduce cancer health disparities globally and subnationally, countries can enhance their capabilities to deliver high-quality, affordable care closer to where most people live. Decentralization and integration of health services can be part of the solution, offloading the strained capacity of tertiary facilities where possible and expanding cadres of trained providers to support some aspects of cancer prevention and control that require a lesser degree of specialization. The strategy to eliminate cervical cancer provides a salient example of a data-driven effort that optimizes resources to dramatically reduce one of the greatest cancer health disparities globally. Here, we highlight two responses to meet the challenge through greater engagement of the primary care workforce and by adoption of universal health care coverage to ensure access to cancer prevention.

INTRODUCTION

Making the best use of resources in global cancer care requires multilevel thinking, interdisciplinary collaboration, and political will. In this article, we try to navigate the complex landscape that influences equitable access to cancer control and care within countries and globally. In the first section, we describe a decentralized training and mentorship program for oncology practice, with an example piloted in India. If proven effective and sustainable, this program can be complementary with other, larger-scale strategic initiatives in to build capacity for the delivery of high-quality decentralized control and care in India, such as the virtual prevention and screening trainings with the National Institute for Cancer Prevention Research (Project ECHO) initiative.[1]

In the second section, we move to the global health policy level, using the strategy to eliminate cervical cancer as an example of global cooperation that optimizes the use of resources, encourages innovation, strengthens health systems, and drives progress toward universal health coverage. We frame this initiative in terms of challenges and opportunities to address health equity challenges faced by many countries, regardless of income level. Among the challenges is the need to better organize the health system and optimize the use of finite resources (financial, human, and infrastructure), both among countries and within countries. Much can be achieved in cancer prevention and control by investing in community-based and primary care models of care delivery. Community-engaged and people-centric efforts will be critical to reach all girls and boys with human papillomavirus (HPV) vaccination efforts while increasing truly equitable access to cervical screening and treatment of all women in the target population in all countries.

A common element across these examples is the need to democratize access to cancer care and controls in a manner that is replicable and sustainable. Data on successes and failures are key to ensuring ongoing learning that can be used to adapt and adopt best practices in any setting.

LEVERAGING THE PRIMARY HEALTH CARE SYSTEM IN INDIA TO INCREASE EQUITABLE ACCESS TO CANCER CARE

Access to care is a multifaceted challenge, requiring a multipronged approach. Overcoming access barriers involves issues of health systems and governments, health care institutions, and patient-related problems (cost of care, travel, wage loss, lack of family support). To address these issues and to improve access to care, a sustainable and replicable model that stresses decentralization and task sharing was designed and implemented across multiple regions of India (the Pendharkar model). This model aims to address capacity building by using existing human resources through the formation of an alternate oncology workforce that relies on local primary care clinicians.[2,3] The mission of this model is to address inequalities in cancer care access by making it available at the level of

Author affiliations and support information (if applicable) appear at the end of this article.

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PRACTICAL APPLICATIONS

- Multisectoral collaborations are needed to reduce cancer health disparities and achieve equitable access to cancer care globally and within countries.
- Decentralization of health services can be an efficient and cost-effective approach to increase access to high-quality cancer care, particularly in geographically remote or otherwise underserved areas.
- Much can be achieved in cancer prevention and control by investing in community-based and primary care service delivery models of care. Primary care is also foundational in achieving universal health coverage.
- Mentorship programs and remote training supported with online platforms can enhance education and quality control in cancer prevention, screening, and treatment.
- The strategy to eliminate cervical cancer as a public health concern can be an exemplar of global cooperation that optimizes the use of resources, encourages innovation, strengthens health systems, and drives progress toward universal health coverage.

district hospitals. The goal is to provide all major elements of cancer care including counseling, assistance in diagnostics, chemotherapy, supportive care, and palliative care.

In India, the health care hierarchy comprises a central health system, followed by the state and, subsequently, the district levels. The central government is responsible for funding and planning programs of national importance. State health departments are managed independently and separately; local health programs, their objectives, and implementation are all designed by the state alone. Within states are the districts, all with one hospital and a main administrative unit. The district is further divided into smaller subunits, called primary health centers. Typically, district hospitals are the major admission centers with diagnostic, pathology, and surgical capabilities. Unlike national centers, staff at the district hospital is predominantly comprised of general duty medical officers with basic qualifications.

In the Pendharkar model, cancer care programs require a "district nodal cancer officer," which in this case is a primary care physician chosen at the state level from the current list of general duty medical officers within the district. It is important to note that there are no specific or published criteria for the selection of the physician in charge. If the physician agrees to take on the role, they undergo cancer-specific training in oncology basics accompanied by training for nurses as well. Training consists of didactic lectures on oncology terminology and the basics of common cancers. It also includes education on essential oncology drugs, their toxicity, and mode of administration, and some time is given to communication skills and treatment recommendations. The training also includes basics of palliative care and end-of-life care. Finally, clinicians are expected to work in a functioning cancer unit for direct observation. After completion, mentoring is afforded to district clinicians through 24-h/day, 7-day/wk telephonic support, virtual consultation on WhatsApp, and a virtual Tumor Board. Community education is an expectation for every district cancer program organized around cancer counseling camps. It is an opportunity for a specialty trained oncologist to visit the districts and provide onsite training. Through these coordinated efforts, the project aims to ensure every patient is appropriately evaluated and managed appropriately. The goal is not to train specialty oncologists at the local level; it is to provide patients a local expert who can work under the supervision and mentorship of specialists.[4] At the initial training (2014), five units were established in the state of Madhya Pradesh. Within a year, this program encompassed all 51 districts of Madhya Pradesh. To date, about 198 doctors from eight states of India have been trained, and more than 150 centers are fully operational to bring local cancer care to around 380 million people.

Models such as this are important for resource-poor countries for several reasons. The health system at a national level in all developing nations has a paucity of specialized cancer care, especially at the local level. Second, patients from rural and lower socioeconomic backgrounds, which comprises 70% to 80% of the population in developing countries, find it difficult to access tertiary care cancer hospitals, which are mostly situated in a metropolitan city, and unfortunately, the number of cancer centers required to cater to the increasing cancer-affected population is limited. Finally, the cost of cancer care including diagnostics, hospitalization fees, and medication is very high, and families are often unable to afford it. When added to travel costs and the loss of wages because of absence from employment, inequities will rise.

Equipping the local primary care workforce to provide cancer care through training, empowerment, and education may be one of the possible ways to solve this dilemma. Physician-based systems are likely to function better because they are the primary contact for all patients. Hence, this model was designed and based around the physician at a district hospital.[5,6] Given that government-run district hospitals are equipped and well-attended parts of the healthcare infrastructure and provide free care irrespective of socioeconomic status, decentralization of health care led by district nodal cancer officers enable us to bring cancer

care closer to home. This district cancer program has been set as a complete state-owned free support system and mitigates many challenges faced by the patients.

Fortunately, this health care model, which started from few districts and has been extended, has proven that these hurdles could be crossed and hence was accepted and enrolled in by many states in India. It has become popular in state-run health promotions. As a result, newer nodal cancer units are being established, and cancer services are becoming widely available, including chemotherapy and palliative care services. All the units have similar systems for providing care. Local communities are using these services spanning all across India. Data from one state show, in a span of 1 year, more than 6,500 patients were registered. There were 35,000 hospital visits with more than 10,000 sessions of chemotherapy. Before the program, patients with cancer were not offered any services in a government-run district hospital. A recent satisfaction survey carried out for patients depicted its wide-scale acceptance and versatility.[7] This model does face some challenges. First, bureaucratic challenges by the local administrative authorities included convincing them that such services can be established. Another challenge is fluidity of the young medical officers' because they keep changing their place of work, and their continuity in the system is not guaranteed. Meanwhile, as the applicability and the practicality of this model is gradually being widely accepted, these challenges will also be conquered.

FROM GLOBAL TO LOCAL AND BACK AGAIN: THE GLOBAL DRIVE TO ELIMINATE CERVICAL CANCER

Global disparities in access to cancer control and care between high-income countries and low- and middle-income countries (LMIC) are well documented. Cervical cancer, an almost entirely preventable disease, remains the fourth most common cancer worldwide, accounting for the deaths of more than 300,000 women annually.[8,9] Close to 9 in 10 women who die of cervical cancer were living in an LMIC, where access to affordable, high-quality cancer health services, including those for cervical cancer prevention and control, is profoundly limited. However now, after many years of virtual neglect by the global health and development community, a combination of grassroots advocacy, civil society mobilization, and scientific progress has led to a call, for the first time in human history, to eliminate (at least this form of) a preventable cancer.

In 2018, World Health Organization (WHO) Director General Dr. Tedros Adhanom Ghebreyesus issued a call to action for the global elimination of cervical cancer as a public health concern. In February 2020, the 146th WHO Executive Board recommended a draft resolution on cervical cancer be adopted by the 73rd World Health Assembly in May 2020.[10] "A Global Strategy toward the Elimination of Cervical Cancer as a Public Health Problem"[8,11] (Sidebar) establishes targets that are based on three mainstays: comprehensive primary prevention, by reaching 90% of HPV vaccination coverage for girls age 15; secondary prevention with effective screening, aiming to reach 70% of women between ages 35 and 45 with a high-performance test; and timely and well-organized treatment of 90% of the cases of cervical precancer and invasive cervical cancer.

The global effort toward the elimination of cervical cancer is the product of a combination of advances in the last decades that increased our understanding of the pathogenesis and epidemiology of the disease. We know that HPV infection is a necessary cause, and with the development of highly effective vaccines against high-risk HPV subtypes, we now have effective tools for primary prevention. With decades of knowledge in implementing effective screening programs, treatment of precancers along with access to radiotherapy, surgery, and systemic therapy for women with invasive cervical cancer, the mortality has drastically been reduced in many countries. Despite these advancements, the burden of the disease has remained disproportionally high because of a myriad of social, economic, and political barriers.[2]

Moreover, this effort could be hindered by disparities in health care access both within and between countries, with a complex interplay of factors including limited access to resources, infrastructure or affordability, and social and cultural barriers such as so-called vaccine hesitancy. That raises the question that, without universal health coverage, is this global initiative bound to fall short of its ambitious goal? What's more, in the face of the global COVID-19 pandemic, can we expect multinational support for the elimination of this single disease, at a time when there are well-founded fears of recurrent outbreaks of other communicable diseases, such as measles and polio?

SIDEBAR. WHO DRAFT STRATEGY FOR THE ELIMINATION OF CERVICAL CANCER[8]

The following 90–70–90 targets that need to be met by 2030 for countries to be on the path towards cervical cancer elimination:

- 90% of girls are fully vaccinated with the HPV vaccine by age 15
- 70% of women are screened with a high-performance test by ages 35 and 45
- 90% of women identified with cervical disease receive treatment (90% of women with precancer treated; 90% of women with invasive cancer managed)

Recently, a series of papers has been published modeling the different scenarios for the cervical cancer elimination plan in Australia,[12] the United States,[13] and, most recently, for 78 countries.[14] These studies predict that those countries with more robust public health and health care systems will be able to achieve the goals toward the elimination earlier. However, without proper planning, the result of a global-scale initiative like this could be the widening of the gap in resource allocation and access to services between those who already have good services and populations with poor access to high-quality affordable health care. For the cervical cancer elimination targets to be realized, we must dramatically close the gap between countries in terms of access and use of all components: vaccination, screening, treatment of precancers, and treatment of women with invasive disease.

However, when thinking about disparities in cancer care, we should not be assuming countries as uniform units of analysis, nor must we consider only income categories, such as these are grouped by the World Bank as high, middle, or low, taking into account only gross national income per capita. We can also view health inequities in general and cancer health disparities in particular in terms of the human development index or other metrics of social inequality. Moreover, the disproportionately high burden of cervical cancer observed in LMICs is also observed within countries where socially and economically disadvantaged or otherwise marginalized populations are invariably more affected in terms of incidence, survival, and mortality.[15] In the United States, for example, Hispanic and non-Hispanic black women have the highest incidence of cervical cancer.[16]

A recent modeling study by Burger et al[13] described the estimated time to cervical cancer elimination in the United States under different assumptions and scenarios. They predict the time to elimination could be reduced by 10 to 13 years compared with status quo just by increasing screening coverage currently at 70% to 90%. However, this will remain an elusive goal unless health disparities are not adequately addressed. People in the United States bear the highest financial burden because of health care than any other developed country.[17] A convoluted system with out-of-pocket costs, coinsurance, and deductibles restrains the use of health services. The reach of the cervical cancer elimination strategy could be severely limited for low-income populations and even more for uninsured people facing these economic barriers.

The American Cancer Society underscores that the largest contributor to racial and ethnic disparities observed in cancer occurrence and cancer care is poverty.[18] Yabroff et al[19] well described the landscape of cancer care in the United States, pointing out that "minority race/ethnicity, living in poverty, limited education, or lacking experience in navigating the health care system," as well as low-income populations and uninsured have increased risk of poor health outcomes, poorer survival, and higher mortality rates compared with people with health insurance coverage. Even for those with insurance, the debts of patients with cancer caused by health care costs and employment loss as a consequence of their illness are among the main causes of personal bankruptcy, leading to poorer quality of life and reduced survival. Analyzing inequities at a local scale, New York City is a paragon of how important socioeconomic determinants are for outcomes of patients with cancer, even for very proximate regions that are broadly characterized as (and usually represented in projection models as) high-income settings. A study analyzing three adjacent neighborhoods, East Harlem, Central Harlem, and Upper East Side, which are all contiguous to tertiary medical care facilities specializing in cancer care, demonstrated sustained mortality rate disparities by area and ethnicity.[20] The goal of reaching cervical cancer elimination in the United States as in other countries will be challenging. Our plans should foresee the current uneven access to health care, low vaccination coverage, the existence of hard-to-reach populations (such as uninsured and undocumented women). Public health promotion and service delivery must be aligned to mitigate the risks of encouraging women to be screened when there is fear of high financial costs,[13,21] potentially lowering a community's trust in the health care system.

In LMICs, ambitious goals centered in one disease can bring another set of problems. These initiatives can overwhelm precarious health systems and worsen the capacity to deliver effective care for other diseases. The Ebola Virus Disease outbreak in 2014 to 2015 demonstrated the limited capacity of action and how compromised health care systems are in many African countries.[22] Regarding cancer care, African health professionals' and community health care workers' workloads are already higher compared with other regions.[23] Insufficient infrastructure, HPV vaccine shortages,[24] and scarcity of essential cancer medicines[25] reflect the myriad of challenges to the delivery of cervical cancer prevention and control in this region. Similarly challenging situations exists in most LMICs in all world regions that have underfunded and fragmented health care systems.[24] Within these countries, differences in access to health care between regions and social classes are even more severe, and so are the health outcomes, especially for patients with cancer in general and women in particular.[15]

A lack of systemic changes addressing the challenges present in these different settings can exacerbate the existing inequity in the access and allocation of resources for cancer care. The most successful health systems are those that achieve the WHO definition of universal health

coverage.[26,27] This implies access without barriers to health care services, taking into account the need to protect individuals from any financial risk, and securing essential diagnostic tools, treatments, and vaccines for all. Tailoring these reforms is not an easy task. The complexity of health systems and the particular interactions that different groups establish with them requires a detailed policy-planning path: one that is aware that minorities, low-income, and other marginalized populations in high-income countries could benefit from strategies successfully implemented in LMICs. Diverse populations will require targeted interventions to reach those minorities that have the highest burdens of disease.

ELIMINATING CERVICAL CANCER, CREATING A PATH FOR TRUE UNIVERSAL HEALTH CARE

How should we design our path forward? The good news is that we can learn from our experiences, and there are many good examples (of successes and failures) provided we are open to sharing these. In the United States, the expansion of Medicare under the Affordable Care Act led to increased screening for cervical and colorectal cancer.[28] In Latin America, a demonstration project carried out by the National Cervical Cancer Prevention Program in Argentina showed that a well-organized screening program based on HPV testing using both clinician and self-collected modalities doubled the detection rate.[29] These examples share the underlying principle of making cancer control and care more equitable, increasing the quality of services, and making available new tools and technologies for an effective and comprehensive approach.

Is this global initiative doomed to fail? In an era of broadening global wealth inequality and destabilized political systems,[30,31] it is important to realize that this is not only a public health issue; there are larger issues of political economy at play that cannot be solved by public health efforts alone, but it still means it is worth trying. Rather than falling into despair, the Global Strategy toward the Elimination of Cervical Cancer[10] can be an opportunity for testing the capacity of global public health entities and national health systems to respond to complex public health challenges. It can also help us to strengthen the case for universal health care access and, in particular, the democratization of the use of resources in global cancer care.

CONCLUSION

Making the best use of resources in global cancer care forces us to think about the complexity of the factors at play. The examples described here can advance our discourse on how to successfully enhance community reach to improve equitable access and delivery of high-quality cancer services. When we think about how to tackle a public health problem globally, our strategies should be nourished by the different experiences learned in different countries and their diverse communities. In these times, the term "global health" might be reimagined to comprise multidirectional learning, for example, from the experiences in rural communities in India, in parallel with evidence gained from addressing cancer health disparities in New York City. Decentralization of education, training, care, and integration of health service delivery are among the strategies that must be rigorously tested and shared to help all countries achieve population level impact in global cancer control and care.

AFFILIATIONS

[1]NYU Grossman School of Medicine, New York, NY
[2]Sarvodaya Cancer Institute, Faridabad, Delhi, India
[3]District Hospital, Ujjain, India
[4]Perlmutter Cancer Center at NYU Langone Health, New York, NY
[5]Section for Global Health, Department of Population Health, NYU Grossman School of Medicine, New York, NY

CORRESPONDING AUTHOR

Ophira Ginsburg, MD, FRCPC, Perlmutter Cancer Center, NYU Langone Health, 180 Madison Ave., New York, NY 10016; email: ophira.ginsburg@nyulangone.org.

AUTHORS' DISCLOSURES OF POTENTIAL CONFLICTS OF INTEREST AND DATA AVAILABILITY STATEMENT

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