THE IMPACT OF LOCAL-GLOBAL PARTNERSHIPS ON CANCER CARE IN LOW-RESOURCE SETTINGS: A CASE STUDY OF THE CICL, TOGO

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Abstract— **In 2020, a landmark private partnership between local and foreign entities resulted in the creation of Togo's first radiation therapy facility (CICL), which began operations in 2021. With a focus on delivering same advanced cancer care as the developed countries, the center invested in cultivating a skilled workforce from within Togo and the broader West African region. To achieve VMAT center status, a concerted effort was made to develop and maintain local and regional human resources through targeted training, online networking technology and upskilling initiatives. The Centre International de Cancerologie de Lomé (CICL) over the past four years have treated a little over 900 cancer patients with VMAT technology and built local expertise that offer training to newly established radiotherapy centers across Africa.**

Keywords— **Partnership, VMAT, CICL, Togo.**

I. INTRODUCTION

According to the GLOBOCAN 2020 database [1] of the International Agency for Research on Cancer, it is estimated that there will be 24 million new cancer cases per year globally from 2020 to 2030. Out of these cancer incidence, approximately 75% of estimated cancer mortalities will occur in the developing countries. Radiotherapy (RT) is a vital and effective method for treating and managing cancers. However, many countries in Africa still lack access to radiotherapy as part of a comprehensive cancer care. Advanced forms of treatments in low and middle-income countries (LMICs) is limited due to lack of resources (both human and equipment) - expertise, expensive equipment and software. From the International Atomic Energy Agency's (IAEA) Directory for Radiotherapy Centres (DIRAC) [2], as of March, 2020, 28 (52%) of Africa's 54 countries had access to some form of external beam radiotherapy, 21 (39%) had brachytherapy capacity, and no country had a capacity that matched the estimated treatment need. Urgent initiatives/collaborations in the setting-up of RT facilities, human capacity building and management are needed to change Africa's worrying trajectory in providing quality comprehensive cancer care to patients in the next decade comparative to same quality of care by the best hospitals in the U.S.A., Europe, and Asia.

According to the International Atomic Energy Agency's (IAEA) publication [3], radiotherapy facilities should acquire sufficient experience in 3D conformal radiotherapy (3D-CRT) before adopting advanced techniques like intensity-modulated radiotherapy (IMRT) or volumetric modulated arc therapy (VMAT). While IMRT and VMAT are widely used in North America, Western Europe, and leading cancer centers globally, many African radiotherapy facilities remain reliant on 3D-CRT. Even new facilities often begin with 3D-CRT. Although advancing radiotherapy techniques should be a gradual process, it is essential for Africa to develop capacities to adopt advanced radiotherapy as a standard for cancer care, aligning with global best practices.

II. MATERIALS AND METHOD

The Republic of Togo; located in West Africa is bordered by Benin, Burkina Faso, and Ghana. The current population is estimated to be 9,614,855 as of December 2024, based on Worldometer projections of the latest United Nations (UN) data [4]. Lomé, the capital city, is situated in the southwest of the country and is the largest city with a vibrant sea port. According to World Bank data [5], Togo recorded an annual percentage growth rate of Gross Domestic Product (GDP) of 6.40 % in the year 2023. A technical document from the World Health Organisation (WHO) "Cancer Togo 2020 Country Profile" [6] outlined the health system capacity and workforce locally available for cancer management - Screening, Diagnosis and Treatment in the country. Below are two main key tables from this document (Table 1 and Table 2).

Table 1 Togo's cancer healthcare system capacity according to the 2020 WHO technical document [6]

Cancer system capacity	As at the year	Status
Availability of population-based cancer registry (PBCR)	2019	Registration activities
Quality of mortality registration	2007-2016	No coverage
No. of external beam radiotherapy (photon, electron)[a]	2019	0.0
No. of mammographs [a]	2020	19.0
No. of CT scanners [a]	2020	16.9
No. of MRI scanners [a]	2020	2.1
No. of PET of PET-CT scanners [a]	2020	0.0

[a] per 10,000 cancer patients

Table 2 Togo's cancer human resource capacity according to the 2020 WHO technical document [6]

Cancer workforce capacity	As at the year	Status
Availability staff in Ministry of Health who dedicates significant proportion of their time to cancer	2019	Yes
No. of radiation oncologist [a]	2019	n/a
No. of medical physicist [a]	2019	n/a
No. of surgeons [a]	2014	42.1
No. of radiologist [a]	2019	n/a
No. of nuclear medicine physician [a]	2019	0.0
No. of medical & pathology lab scientists [a]	2015	857.7

[a] *per 10,000 cancer patients*

III. RESULTS AND DISCUSSION

The international partners contributed technical expertise, encompassing facility design, equipment installation, and software implementation, as well as continuous clinical and operational support. Prior to clinical takeoff, the local team were offered requisite training and upgrades where necessary. Meanwhile, the local partners have forged alliances with the local university and prominent healthcare institutions to offer theoretical, practical training opportunities for students and professionals as a form of adequate local human resource capability building.

Notably, the Centre International de Cancerologie de Lomé (CICL) in Togo boasts a workforce comprised entirely of West African professionals, including radiation and medical oncologists, medical physicist, radiation therapists, biomedical engineer, oncology nurses and medical secretaries. From January 2021 to December 2024, the center had treated 906 cancer patients across various age range successfully, administering only advanced (VMAT) treatments as captured in Figure 1.

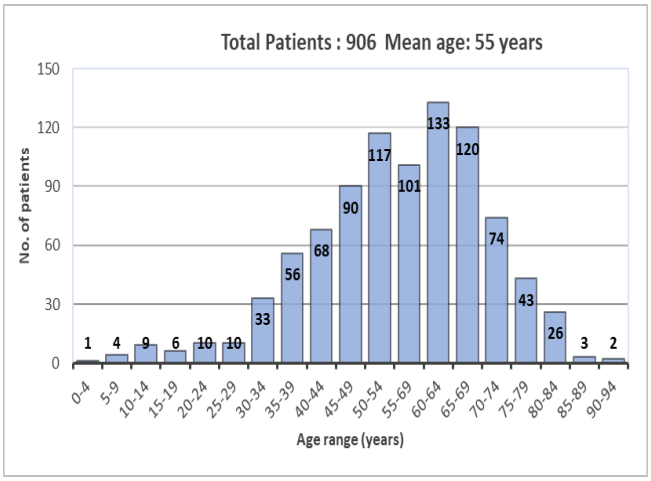
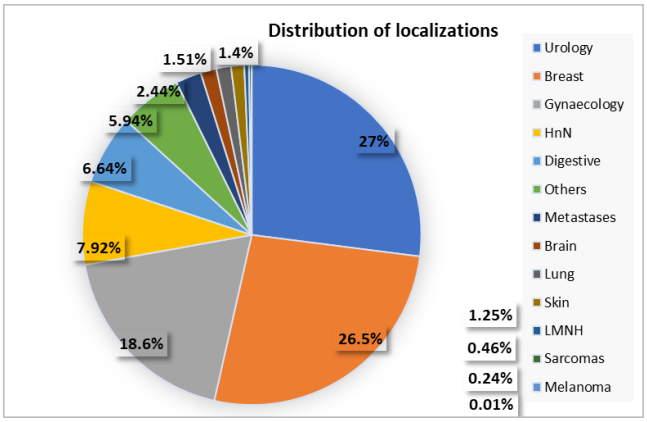


Fig. 1 Total number of cancer patients per age ranges treated with VMAT

The mean age was 55 years with the highest number of patients falling within the 60 – 64 years age range. The pathology distribution of all cancer treated within the same time period are presented in Figure 2 with urological cancers (including prostate cancer, renal/kidney cancers, bladder cancer, testicular and penile cancers) been the most treated cancer cases followed by breast cancer.



NB: HnN=Head and Neck, LMNH=Non-Hodgkin's lymphoma

Fig. 2 Pathological distribution of cancer cases treated with VMAT

IV. CONCLUSIONS

Such efficient collaborative strategies do not only help build human resource capacity for Africa but build competent and confidence workforce capable of delivering same high-quality care as in major international RT centers. Togo, a country with no RT facility and experience has gone from zero external beam treatment capability in 2020 to fully VMAT treatment. This oncology solution is proving to be very successful and hope such model can be replicated to other parts of the African continent. In 2023, a similar local-international partnership was replicated in Blantyre in Malawi (International Blantyre Cancer Center) to birth the country's first radiotherapy facility offering advanced cancer treatments.

Critical to the success of building local capacity is for African countries with rich expertise to help train other African countries through a deliberate national-national, public-private or local-foreign collaborations supported by governments, professional bodies and other key stakeholders. With the right collaborations, advanced treatment techniques should be the standard treatment modality for care all radiotherapy facilities in Africa within the next decade. Staff from CICL have offered clinical training to radiation therapy staff from newly established RT facilities in Nigeria and Malawi. These partnerships have also impacted positively on expanding cancer care in these countries by offering technical and human resource support to its governments (Togo and Malawi) in the setting up of a second radiotherapy facility.

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