Broken Machines or Broken Systems – The Ugandan Experience, on Accessing / Maintaining Radiotherapy Services in Low and Middle-Income Countries (LMIC)

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Introduction

• By 2020, ≈ 70% of new cancer cases will occur in LMICs.
• Only 26 African countries have RT and 27 don’t (DIRAC).
• Expected no. of new cancer cases in Africa was 700,000 in 2015.
• Over 50% of cancer patient’s benefit from RT alone or in combination with surgery or chemo. ⇒ ≈ 350,000 would require RT.
• Common cancers e.g cacx, H&N, etc presenting in advanced stages – are incurable without RT, especially in absence of specialized surgery & chemo.
• Despite this enormous need, access to RT is inadequate for most cancer patients and machine down-time remains high.
• The Machines per Million Population (MMP), in LMICs very low 0.1-0.3, compared to developed countries 4.0–6.0.
CASE IN POINT

- Currently, Uganda has no functional EBRT.
- The Cobalt-60 machine, installed at Mulago in 1995 stopped functioning in March 2016, a feature that attracted international attention.
- Efforts for the expansion of RT services in Uganda started as early as 2000.
- It was planned to have 2 more EBRT units at Mulago and 3 centres in regional hospitals.
- Due to budgetary constraints, this expansion program was postponed every year until it was dropped.
- Plans for the replacement of the broken Cobalt unit started in 2005, three years after a major overhaul that included source exchange.

New cancer patients treated with EBRT and Brachy at Mulago RT Dept 1995 - 2015

- The number of new cancer patients worked on this machine increased from 292 in 1995 to 1920 in 2015; treating 25,465 patients (≈ 600,000 sessions) over the 21 year.
- Compared to a Linac, that can treat ≈ 350,000 sessions.
The department made several consultations & expert missions sought from IAEA:
- Assessment of Cobalt-60 machine and current capabilities in the Dept - Dec 2008
- Design and construction of a bunker for expansion of RT services - Dec 2011
Despite all these recommendations - no tangible outcomes as far as expansion of RT.
There were numerous administrative/managerial factors that hindered RT progress:
- Between 2010-2011, administration identified a contractor to construct a bunker, procure and install a new Cobalt-60 machine. Before process was completed, there was a change in administration in April 2011 - resulted in halting process.
- Between 2011-2013, the new administration came up with a relocation plan of the dept, worked on designs for the RT bunkers (2 EBRT/1 HDR and auxiliary facilities). Before the process was concluded, the RT dept was transferred administratively to the Uganda Cancer Institute (UCI), in June 2013, in fulfilment of PACT recommendation, with the aim of creating an integrated cancer treatment centre. The UCI administration noted inaccuracies and the process was halted; construction started in June 2016.
- In 2013, the Uganda Govt and IAEA cost shared to purchase a new cobalt-60 – this machine has not been installed yet – Installation expected July – August 2017
Discussion/conclusions

• Irabor et al (2016) reported the stagnation of radiation oncology resources in Nigeria:
  o As of Jan 2016: only 2/9 commissioned RT centres were functional, 2/5 Linac installed in 2010 were not functional and there were fewer brachy (HDR+LDR) than in 2001.
  o The blame was on the Nigeria economic and political climate, lack of trained servicing engineers, procurement of equipment with minimal input from end users and no servicing contracts.
• Johanna et al (2016) reported that resource challenges were affecting RT in the Philippines.
• The Kenya’s main hospital has a functional Cobalt-60 unit where the source has not been replaced since its installation, over 17 years.
• The Zambia’s only RT centre installed a Co-60 unit in 2013 that is not yet utilised due to procurement mishaps – unfortunately the source is decaying.

  ❖ The above scenarios are characteristics of system breakdown, which is a collapse of responsible authorities to perform, organise, maintain and support services following a fixed plan or set of rules.
  ❖ Machine breakdown, downtime & decommissioning are some of the many events in RT dept.
  ❖ There is need for support for partnership and systems of care, more vigorous mechanisms to ensure that RT is part of planning for cancer care and control in LMICs.
  ❖ There are essential requirements that need much bigger budget, staff and mandate to ameliorate the numerous logistical complexities of acquiring and maintaining RT services.
  ❖ The lessons from Uganda and other LMICs emphasize the fact that it’s not that machines break, but systems do.