



# Session 17

## Practical Implementation of New Technologies in Low-to-Middle Income Countries

### Introduction

Jacob (Jake) VanDyk  
*Western University*  
*London, Ontario, **Canada***



# Practical Implementation of New Technologies in LMICs

- Survey
  - What are the biggest issues for the implementation of new technologies?
  - What guidance can you provide on how to overcome the implementation barriers?



# Survey Questions

1. From your perspective, what is the level of need (on a scale of 1 to 10) for new technologies in your context or country?
2. From your perspective, how would you rate (on a scale of 1 to 10) the following barriers to the implementation of new radiotherapy-related techniques or technologies in your context or country?
3. Considering your context or country, please rate the following factors or considerations (on a scale of 1 to 10) that could help overcome some of the barriers listed in question 2?
4. What is your professional specialty?
5. In what country do you work (i.e., what country do your answers represent)?
6. Do you have any additional comments or suggestions not addressed by the above questions that consider the practical implementation of new technologies in low-to-middle income countries?



# Survey Results

- Responses
  - 78 sent, 2 bounced
    - 9 HIC, 38 UMIC, 28 LMIC, 3 LIC
  - 27 responses
  - 36% response rate

Professional	HIC	UMIC	LMIC	LIC	Total
RO	2	6	3	1	12
MP	2	10	3	0	15

81% from MICs

2017	
HIC threshold	≥ \$12,476 (100%)
Mean of HIC responses	= \$16,658 (134%)
North America	= \$55,117 (442%)
Euro area	= \$37,546 (301%)

← Low end of HICs

# Survey Results



1. From your perspective, what is the level of need (on a scale of 1 to 10) for new technologies in your context or country?

## Top 4

	Weighted Average
Intensity-modulated radiation therapy (IMRT)	7.96
Image-guided radiation therapy (IGRT)	7.88
CT-simulation capabilities	7.74
Modern 3D conformal radiation treatment planning with IMRT, VMAT and IGRT capabilities	7.7

## Bottom 4

Intraoperative radiotherapy (IORT)	3.77
New simple, single energy linacs	3.74
New cobalt-60 machines with multileaf collimators (MLC) and IMRT capabilities	3.63
New simple cobalt-60 machines	2.81

# Survey Results

2. From your perspective, how would you rate (on a scale of 1 to 10) the following barriers to the implementation of new radiotherapy-related techniques or technologies in your context or country?

Lack of money for professional staff	7.41	Top 4
Lack of proper training for professional staff due to lack of priority by upper level management	7.15	
Lack of money for appropriate equipment	6.96	
Lack of proper training for professional staff due to unavailability of staff to obtain the needed training	6.67	
Lack of proper training for professional staff due to unavailability of funds	6.65	Bottom 4
Lack of understanding of the role of radiotherapy in cancer control at the Health Ministry level	6.59	
Lack of money for new building or facilities upgrade	6.37	
Lack of money for machine servicing	6.35	
Absence of national radiotherapy plan	6.3	
Lack of appropriately available service for upgraded or new equipment	6.22	
Lack of proper training for professional staff due to unavailability of nearby training programs	5.92	
Lack of appropriate diagnostic services such as pathology, diagnostic imaging or other relevant clinical service	4.04	
Physical infrastructure (lack of uniform and consistent electrical power and chilling water)	3.19	
Inadequate national radiation safety regulatory process	2.96	

# Survey Results



3. Considering your context or country, please rate the following factors or considerations (on a scale of 1 to 10) that could help overcome some of the barriers listed in question 2?

Appropriate prioritization by informed decision makers and/or upper level managers of resources for new techniques or technologies	9.04
Partnering with the IAEA or non-government organizations to provide partial education and training support	8.62
Encouragement by government agencies to support the development of training programs for radiation oncology professionals	8.33
Negotiation support from the IAEA or non-government organization with vendors to provide lower cost technologies	7.93
Full funding by the IAEA or non-government organizations to support out-of-country education and training	7.63
Negotiation support from the IAEA or non-government organization with vendors to provide nearby regional technology service support	7.56
Free provision of local education and training support by the IAEA or non-government organizations	7.41
Partnering with the IAEA or non-government organizations to provide partial financial support	7.22
Partial funding by the IAEA or non-government organizations to support out-of-country education and training	6.41
Donation of money for purchase of technology by the IAEA or non-government organizations.	6.27
Development of national radiation safety regulatory process	5.56



# Conclusions

- Survey responses primarily from MICs
- MICs not interested in low level technologies
  - They want what HICs have
- Major barriers
  - Lack of money
  - Lack of training
- How to overcome barriers
  - Appropriate prioritization by informed decision makers
  - Partnering with various organizations to provide education/training and financial support