

Expanding access to Radiation Therapy : The Ghanaian experience

A Vienna Centre for Disarmament and Non-Proliferation Programme

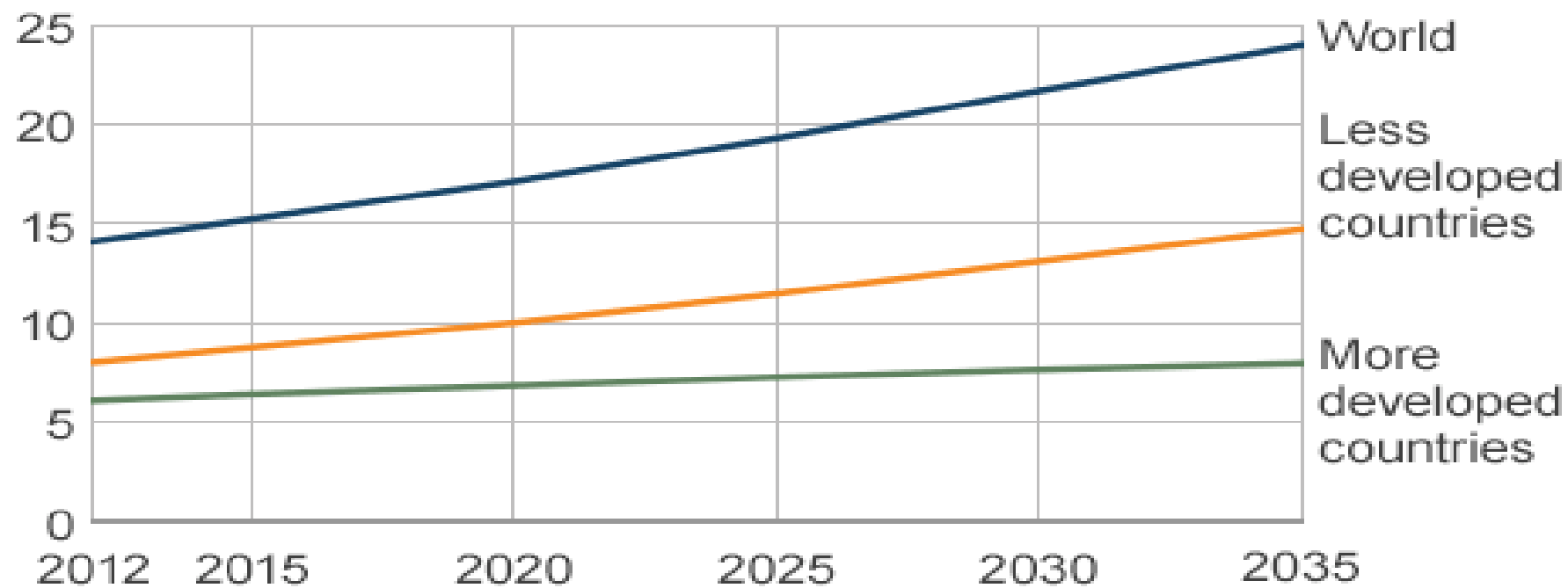
February 4, 2022

by

Joel Yarney

Predicted global cancer cases

Cases (millions)



Source: WHO GloboCan

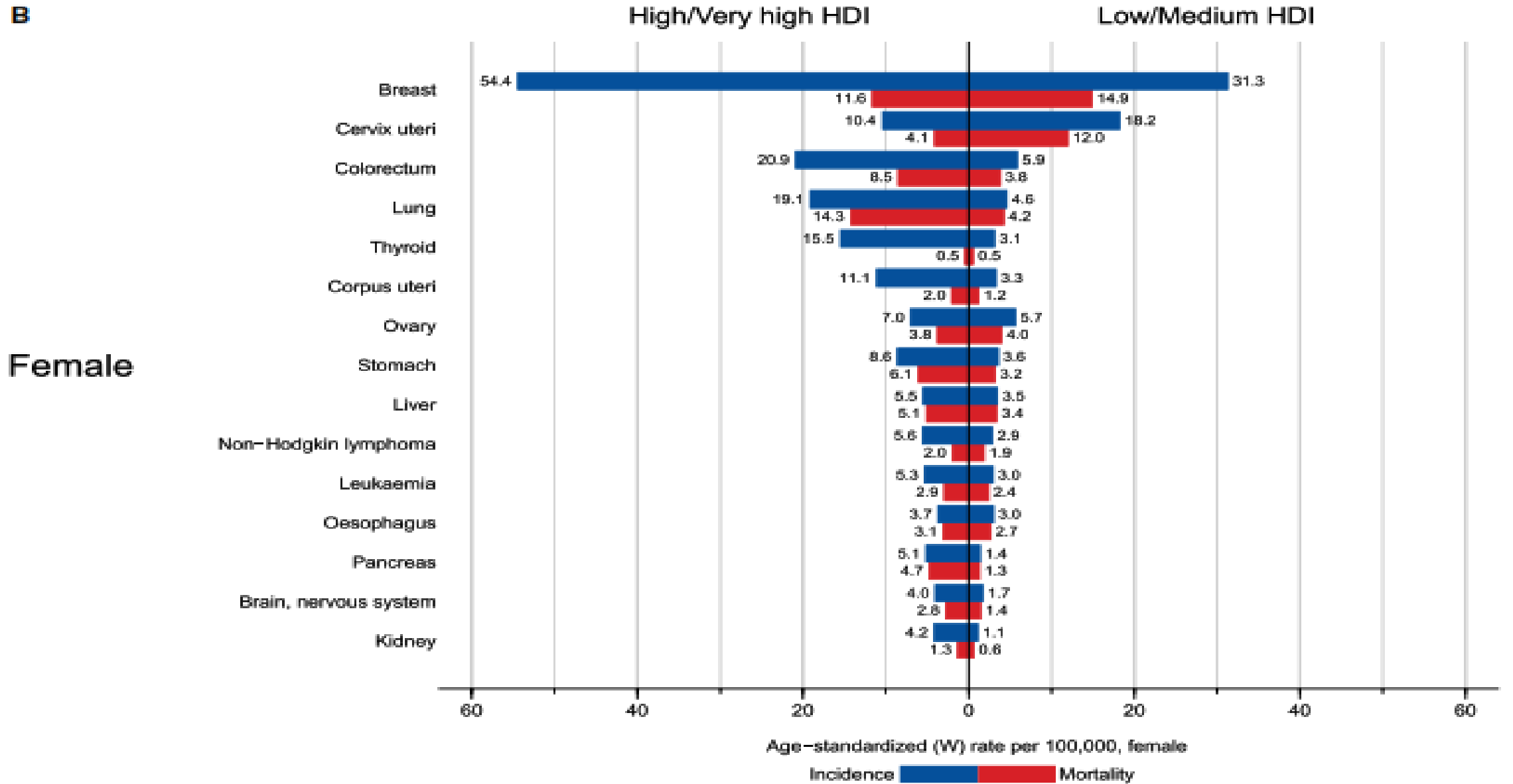


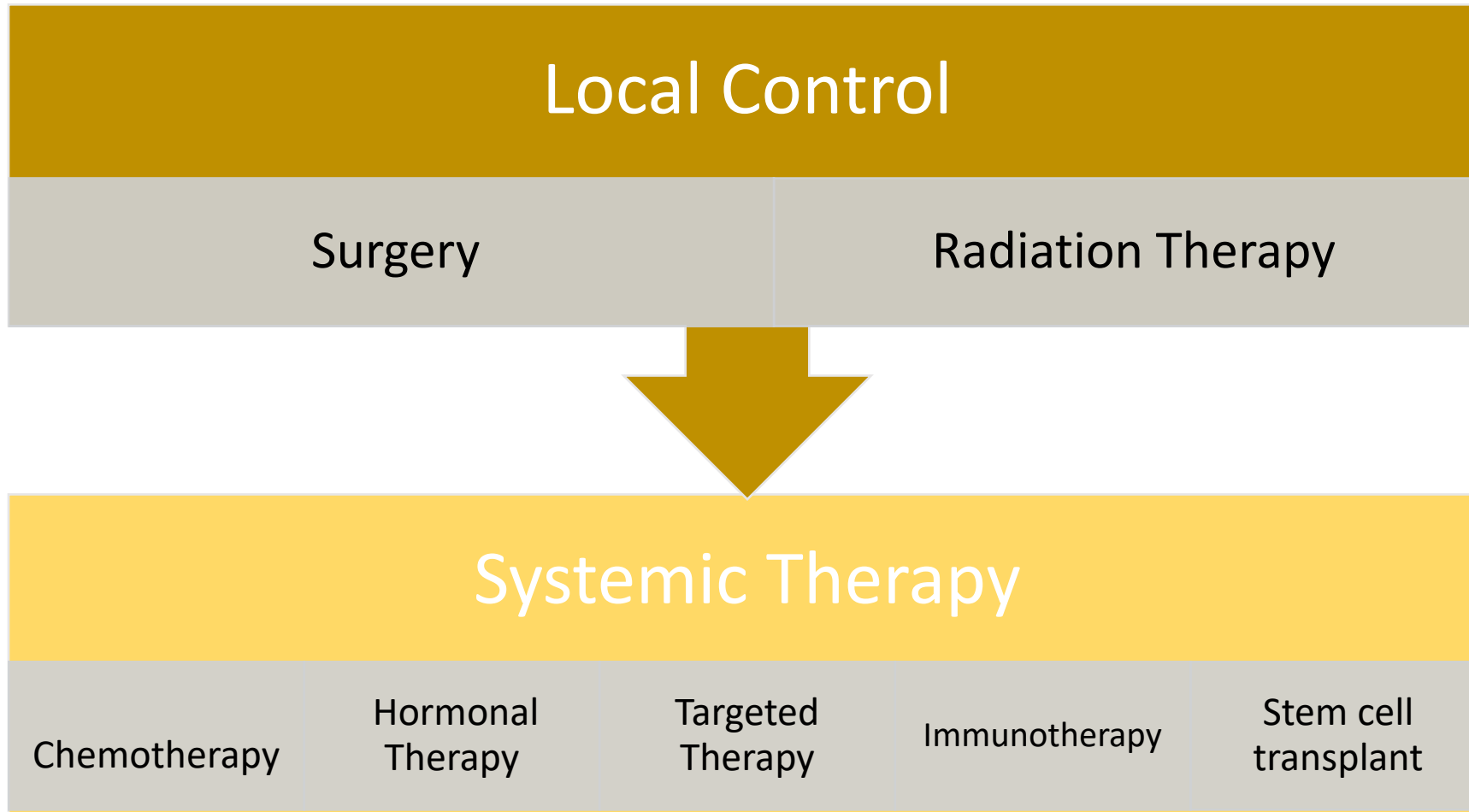
FIGURE 7. Bar Charts of Incidence and Mortality Age-Standardized Rates in High/Very-High Human Development Index (HDI) Regions Versus Low/Medium HDI Regions Among (A) Men and (B) Women in 2018. The 15 most common cancers world (W) in 2018 are shown in descending order of the overall age-standardized rate for both sexes combined. Source: GLOBOCAN 2018.



Incidence, Mortality and Prevalence by cancer site

Cancer	New cases				Deaths				5-year prevalence (all ages)	
	Number	Rank	(%)	Cum.risk	Number	Rank	(%)	Cum.risk	Number	Prop. (per 100 000)
Breast	4 482	1	18.7	3.93	2 055	2	13.0	1.92	10 134	66.14
Liver	3 452	2	14.4	1.73	3 166	1	20.0	1.67	4 251	13.68
Cervix uteri	2 797	3	11.6	2.98	1 699	3	10.8	1.95	5 940	38.77
Prostate	2 129	4	8.9	3.45	1 117	4	7.1	1.71	3 757	23.85
Non-Hodgkin lymphoma	1 197	5	5.0	0.46	734	5	4.6	0.33	2 807	9.03
Ovary	1 001	6	4.2	0.91	671	7	4.2	0.73	2 190	14.29
Stomach	769	7	3.2	0.52	674	6	4.3	0.46	1 077	3.47
Lung	535	8	2.2	0.37	487	8	3.1	0.34	626	2.01
Leukaemia	533	9	2.2	0.14	396	9	2.5	0.12	1 298	4.18
Bladder	430	10	1.8	0.25	221	14	1.4	0.14	911	2.93

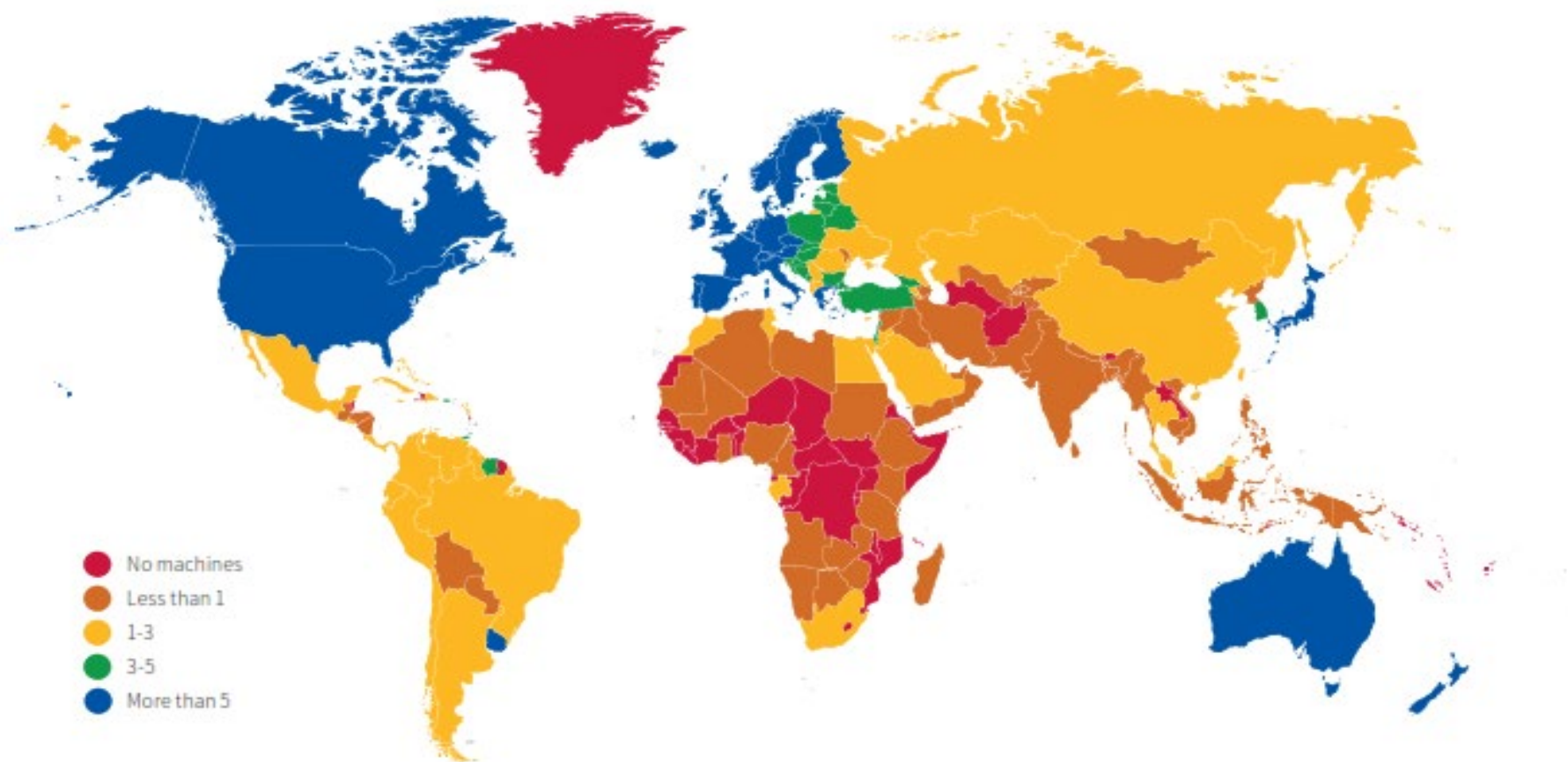
Treatment Modalities



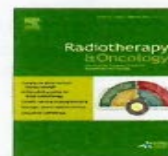
Radiation Oncology Contribution

- Modalities for Cancer treatment
 - Surgery
 - Radiotherapy
 - Systemic Therapy
 - Hormone
 - Immunotherapy
 - Chemotherapy
- Contribution to cure
 - Surgery: 40- 50%
 - Radiation Therapy: 35-40%
 - Systemic Therapy : 10-15%
- Palliative care
 - Pain control
 - Bleeding
 - Obstruction
 - Spinal cord compression
 - Cerebral Metastases

Figure 5. Number of Radiotherapy Machines per 1 Million People, 2017



Source: Directory of Radiotherapy Centers (DIRAC). International Atomic Energy Agency, 2017.



Radiotherapy utilization

Radiotherapy utilization in developing countries: An IAEA study



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Table 2

Characteristics, radiotherapy infrastructure and RTU rates results in 9 middle-income countries.

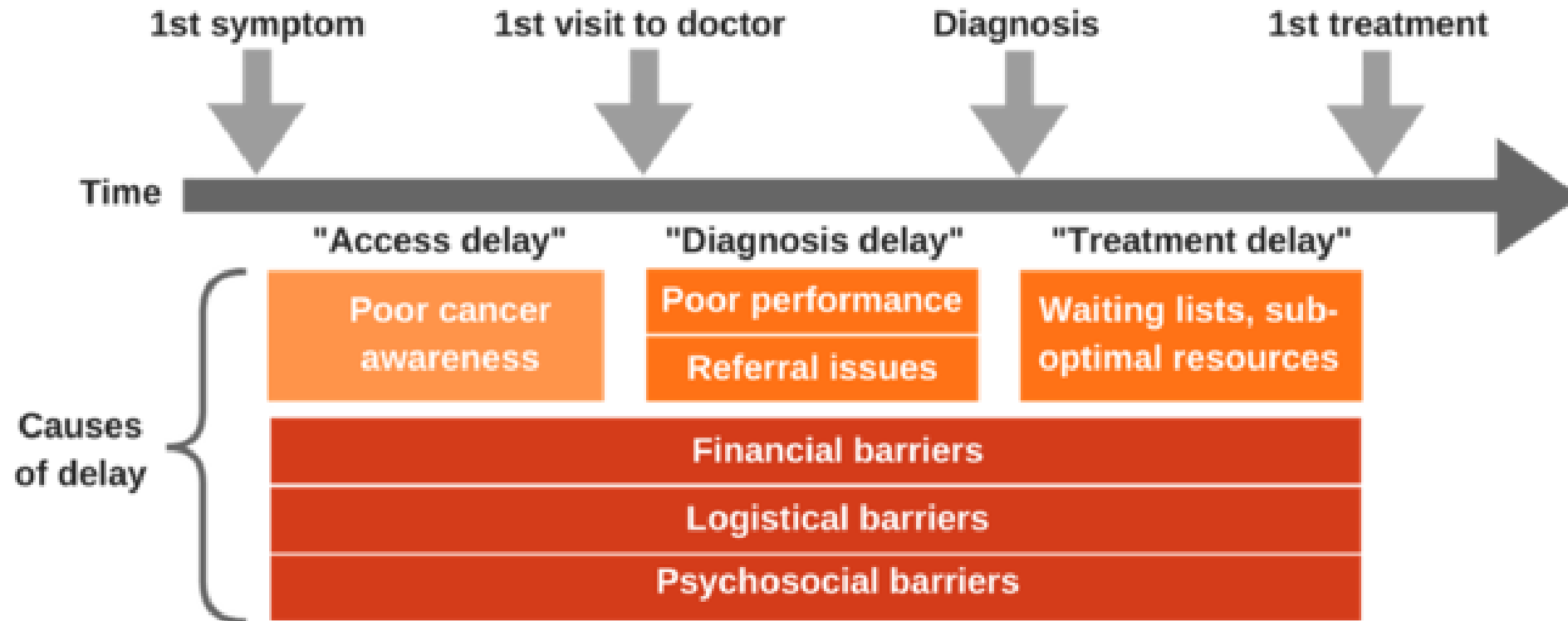
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
Country	Population (millions)	New cancer cases 2012	No. RT centres	No. tele-therapy machines (2012)	Teletherapy machines/1000 cancer cases (2012)	All RT patients in 2012	New RT patients in 2012	Re-irradiation rate (%)	Optimal RTU rate (%)	Actual RTU rate (%)	Diff. (10. minus 11.) (%)	Unmet need (%)
Costa Rica	4.793	8 900	4	8	0.89	3 487	3 138	10	47	35	12	25.5
Ghana	25.545	15 800	3	3	0.19	1 480	1 376	7	51	9	42	82.3
Malaysia	29.321	37 400	21	42	1.1	11 636	10 385	12	53	28	25	47
Philippines	96.471	98 200	27	34	0.34	10 894	10 087	7.4	53	10.3	42.7	80.5
Romania	21.387	78 800	16	23	0.29	19 490	17 346	11	52	22	30	57.6
Serbia	9.846	42 200	6	15	0.35	12 739	10 046	21	52	23.8	28	54
Slovenia	2.040	11 500	1	8	0.7	4 752	3 602	24	48	31	17	35.4
Tunisia	10.704	12 200	10	16	1.3	6 300	5 670	10	56	46	10	18
Uruguay	3.391	13 357	8	14	1.05	5 750	5 020	13	52	37	15	29
Median								11	52	28	24	47

Column 2 – UN Population Information Network.

Column 3 – Globocan-2012.

Column 13 – Percent unmet need = [(optimal RTU rate – actual RTU rate)/optimal RTU rate] × 100.

What causes delays in cancer diagnosis and treatment?



Treatment Challenges



Late presentation



Distribution of treatment sites and investigative tools



Drug availability



Cost of treatment(tax)



Referral patterns/Levels of Care



Complimentary and Alternative Medicine use and Policy gap



Diagnosis: PSA accuracy, Pathology service



Distribution and number of specialist for specialized techniques



★ = Radiotherapy Center

FIGURE 1. Distribution of radiation therapy centers in Ghana.

Table 1. Installed Radiation Therapy Capacity in Ghana

	Pre 2012			Post 2012		
	KBTH	KATH	SGMC	KBTH	KATH	SGMC
External Beam Teletherapy Unit	1	1	-	2	2	1
Linear accelerator	-	-	-	1	1	1
Cobalt-60	1	1	-	1	1	-
Operational units	1	1	-	2	1	1
Brachytherapy Unit	1	1	-	1	1	1
Low dose rate unit	1	1	-	-	1	-
High dose rate unit	-	-	-	1	-	1
Operational units	1	1	-	1	1	1



Ministry of Health

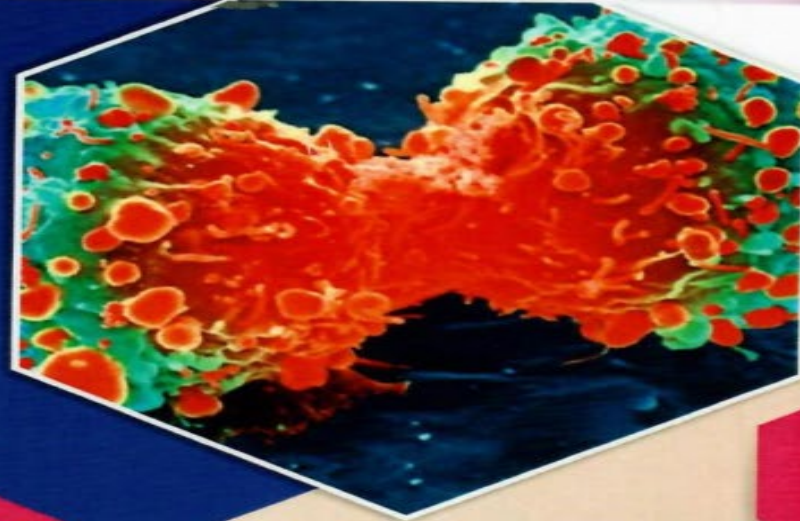
NATIONAL STRATEGY FOR CANCER CONTROL IN GHANA

2012 - 2016



REPUBLIC OF GHANA

MINISTRY OF HEALTH



National Guideline For Cancer Management

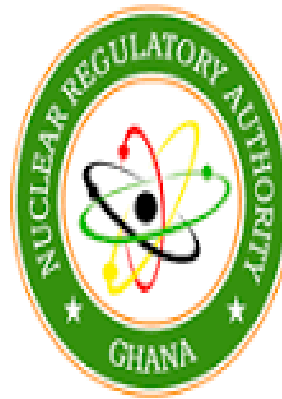
FEBRUARY 2017



	Linear Accelerator	Cobalt
Initial cost	+++++	++
Maintenance cost	+++++	+
Source change	0	++++
Radiation protection/Safety/Security	+++	++
Flexibility in planning	++++	+
Cost of treatment ratio	3	1



KORLE BU
TEACHING HOSPITAL



Nuclear Regulatory Authority
'ensuring the protection of people and the environment from radiation hazard'

