

## HUMAN RESOURCES FOR TREATING NEW CANCER CASES IN UGANDA

### Executive Summary

The purpose of this report is to describe the human resources needed in Uganda to treat new cancer patients. The population of Uganda is approximately 35.62 million (17.81 million men and 17.81 million women) and the estimated number of new cancer cases in Uganda for the year 2012, based on GLOBOCAN data (<http://globocan.iarc.fr/>) for Uganda as a whole was 29380 (14052 in men and 15328 in women) (Table A).

The five most common cancers in Uganda are (1) gynecological (cervix uteri, corpus uteri and ovary), (2) Kaposi sarcoma, (3) urological (bladder, kidney, prostate and testis), (4) hematological malignancies (Hodgkin lymphoma, non-Hodgkin lymphoma, multiple myeloma and leukemia) and (5) breast.

Table A: The ten most frequently occurring cancers in Uganda for men and women based on 2012 GLOBOCAN data.

Cancer	BOTH SEXES		MEN		WOMEN	
	Incidence	Rank	Incidence	Rank	Incidence	Rank
All cancers excl. non-melanoma skin cancer	29380		14052		15328	
Gynecological	4753	1			4753	1
Kaposi sarcoma	3909	2	2514	2	1395	3
Urological	3330	3	3064	1	266	9
Hematological	3013	4	1677	3	1336	4
Breast	2420	5			2420	2
Esophagus	2377	6	1609	4	768	5
Head and Neck	1360	7	793	5	567	7
Liver	1351	8	783	6	568	6
Colorectal	1055	9	515	7	540	8
Stomach	720	10	492	8	228	11
Lung	390	11	190	9	200	12
Brain, nervous system	368	12	124	12	244	10
Pancreas	320	13	169	10	151	13

Newly diagnosed cancer patients need pathology, surgery, chemotherapy and/or radiation therapy. The number of oncologists needed is based, therefore, on the number of patients requiring pathology, surgery, chemotherapy and radiation therapy (Table B). This number is estimated from the percentage of patients requiring surgery, chemotherapy and/or radiation therapy for the top ten cancers in both men and women.

For developing countries the International Atomic Energy Agency (IAEA) recommends training Radiation/Clinical Oncologists who can prescribe both radiation and chemotherapy for the common solid cancers, instead of separate medical and radiation oncologists. Hematological malignancies are treated primarily by hematologist-oncologists. The number of specialists needed is based upon the number of cancer patients but each city, in order to ensure coverage if one person leaves or goes on vacation, must have at least 2 surgical oncologists, 2 radiation/clinical oncologists, 2 hematologist oncologists, etc.

Table B: Number of Oncologists needed for Uganda's 2 most populous cities based on 2011 population estimates (<http://citypopulation.de/>) and 2012 GLOBOCAN data for new cancer cases.

	Population	New Cancer Cases	Hematologist Oncologists	Surgical Oncologists	Radiation / Clinical Oncologists	Urologic Oncologists	Gynecologic Oncologists	Pathologists
Kampala	1659600	1369	2 <sup>¥</sup>	2	7	2 <sup>¥</sup>	2 <sup>¥</sup>	3
Kira	179800	149	2 <sup>¥</sup>	2 <sup>¥</sup>	2 <sup>¥</sup>	2 <sup>¥</sup>	2 <sup>¥</sup>	2 <sup>¥</sup>

<sup>¥</sup>At least 2 are needed in each city.

In addition to oncologists, support staff such as onco-pharmacists, pharmacy technicians, oncology nurses and palliative care specialists is also needed. Many cancer patients require hospitalization for diagnosis, treatment and/or complications, therefore an adequate number of oncology beds will be needed. The number of oncology nurses, onco-pharmacists and pharmacy technicians needed is based upon the number of beds occupied daily by cancer patients while the number of palliative care specialists is based on the number of new cancer cases per year (Table C). The oncology nursing staff for each 24-bed oncology unit (operating 24 hours a day, 7 days a week) comprises of one head nurse and a nurse specialist as well as 13 nurses working 8 hour shifts, 5 days per week.

Table C: Number of Oncology Units, Nursing and Pharmacy Staff needed for Uganda's 2 most populous cities based on 2011 population estimates and 2012 GLOBOCAN data for new cancer cases.

	New Cancer Cases	Maximum # of beds/day	# of 24 bed oncology wards	Onco-Pharmacists	Onco-Pharmacy Technicians	Palliative Care Specialists	Oncology Nursing Staff other than Radiation Oncology Nurses
Kampala	1369	21	1	4	6	3	15

Kira	149	3	1	4	6	2 <sup>y</sup>	15
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<sup>y</sup>At least 2 are needed in each city.

Since many cancer patients require radiotherapy, appropriately equipped facilities will be needed along with radiation oncology staff (Tables D and E). Radiation oncology staff includes radiation therapy technicians, medical physicists, Linac engineers and radiation oncology nurses in addition to radiation/clinical oncologists. The minimum radiation therapy equipment requirements are at least one of each: Linac, brachytherapy unit, CT simulator, treatment planning computer and dosimetry/quality assurance package.

Table D: Radiation Therapy Staff needed for Uganda's 2 most populous cities based on 2011 population estimates and 2012 GLOBOCAN data for new cancer cases.

	New Cancer Cases	Radiation / Clinical Oncologists	Radiation Therapy Technicians	Medical Physicists	Linac Engineers	Radiation Oncology Nurses
Kampala	1369	7	9	3	2 <sup>y</sup>	3
Kira	149	2 <sup>y</sup>	2 <sup>y</sup>	2 <sup>y</sup>	2 <sup>y</sup>	2 <sup>y</sup>

<sup>y</sup>At least 2 are needed in each city.

Table E: Radiation Therapy Equipment needed for Uganda's 2 most populous cities based on 2011 population estimates and 2012 GLOBOCAN data for new cancer cases.

	New Cancer Cases	Linacs / Co 60 Megavolt Units	# of Brachytherapy units	# CT simulators	# of treatment planning computers	# of dosimetry/QA package
Kampala	1369	2	1	1	1	1
Kira	149	1	1	1	1	1

NOTE: Guidelines from the IAEA of the United Nations were used to calculate the radiation therapy equipment and staff needed in the setting of a developing country. Guidelines from the Oncology Nursing Society were used to calculate the number of nurses needed. Several other specialty societies were also requested to provide guidelines but in most cases there were none, therefore colleagues active in those fields were consulted for estimating the number of staff needed.