HUMAN RESOURCES FOR TREATING NEW CANCER CASES IN COSTA RICA

Executive Summary

The purpose of this report is to describe the human resources needed in Costa Rica to treat new cancer patients. The population of Costa Rica is approximately 4.79 million (2.43 million men and 2.36 million women) and the estimated number of new cancer cases in Costa Rica for the year 2012, based on GLOBOCAN data for Costa Rica as a whole (http://globocan.iarc.fr/) was 8948 (4596 in men and 4352 in women) (Table A).

The five most common cancers in Costa Rica are (1) urological (bladder, kidney, prostate and testis), (2) breast, (3) stomach, (4) colorectal and (5) head and neck (lip, oral cavity, nasopharynx, other pharynx, larynx and thyroid).

Table A: The five most frequently occurring cancers in Costa Rica 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	8948		4596		4352	
Urological	2010	1	1904	1	106	8
Breast	1145	2			1145	1
Stomach	874	3	513	2	361	5
Colorectal	819	4	404	3	415	4
Head and Neck	746	5	258	5	488	3
Hematological	703	6	377	4	326	6
Gynecological	616	7			616	2

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 Costa Rica's 2 most populous major urban areas based on 2011 population estimates (http://citypopulation.de/) and 2012 GLOBOCAN data for new cancer cases.

	Population	New Cancer Cases	Surgical Oncologists	Radiation / Clinical Oncologists	Urologic Oncologists	Pathologists
San José	1188019	2218	3	12	2	5
Heredia	279984	523	2[¥]	3	2[¥]	2

[¥]At least 2 are needed in each major urban area.

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 Costa Rica's 2 most populous major urban areas 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
San José	2218	46	2	8	12	5	30
Heredia	523	11	1	4	6	2	15

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 Costa Rica's 2 most populous major urban areas 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**
San José	2218	12	16	6	2	6
Heredia	523	3	4	2	2[¥]	2

[¥]At least 2 are needed in each major urban area.

Table E: Radiation Therapy Equipment needed for Costa Rica's 2 most populous major urban areas 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**
San José	2218	3	2	2	2	2
Heredia	523	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.