

## HUMAN RESOURCES FOR TREATING NEW CANCER CASES IN CUBA

### Executive Summary

The purpose of this report is to describe the human resources needed in Cuba to treat new cancer patients. The population of Cuba is approximately 11.25 million (5.66 million men and 5.59 million women) and the estimated number of new cancer cases in Cuba for the year 2012, based on GLOBOCAN data (<http://globocan.iarc.fr/>) for Cuba as a whole was 39410 (22343 in men and 17067 in women) (Table A).

The five most common cancers in Cuba are (1) urological (bladder, kidney, prostate and testis), (2) lung, (3) breast, (4) colorectal and (5) gynecological (cervix uteri, corpus uteri and ovary).

Table A: The ten most frequently occurring cancers in Cuba 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	39410		22343		17067	
Urological	10047	1	9585	1	462	7
Lung	6143	2	3861	2	2282	3
Breast	4433	3			4433	1
Colorectal	3896	4	1634	4	2262	4
Gynecological	3087	5			3087	2
Head and Neck	2858	6	2279	3	579	6
Hematological	2104	7	1164	5	940	5
Stomach	1126	8	682	6	444	9
Pancreas	895	9	436	8	459	8
Esophagus	834	10	661	7	173	12
Brain, nervous system	786	11	372	9	414	10
Liver	725	12	361	10	364	11

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 Cuba's 2 most populous cities based on 2013 population estimates (<http://citypopulation.de/>) and 2012 GLOBOCAN data for new cancer cases.

	Population	Hematologist Oncologists	Surgical Oncologists	Radiation / Clinical Oncologists	Urologic Oncologists	Gynecologic Oncologist	Pathologists
La Habana	2117343	2 <sup>y</sup>	7	38	4	2	15
Santiago de Cuba	432266	2 <sup>y</sup>	2	8	2 <sup>y</sup>	2 <sup>y</sup>	4

<sup>y</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 Cuba's 2 most populous cities based on 2013 population 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
La Habana	7418	131	6	24	36	15	90
Santiago de Cuba	1515	27	2	8	12	4	30

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 Cuba's 2 most populous cities based on 2013 population estimates and 2012 GLOBOCAN data for new cancer cases.

	<b>New Cancer Cases</b>	<b>Radiation / Clinical Oncologists</b>	<b>Radiation Therapy Technicians</b>	<b>Medical Physicists</b>	<b>Linac Engineers</b>	<b>Radiation Oncology Nurses</b>
La Habana	7418	38	53	18	5	18
Santiago de Cuba	1515	8	11	4	2 <sup>y</sup>	4

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

Table E: Radiation Therapy Equipment needed for Cuba's 2 most populous cities based on 2013 population estimates and 2012 GLOBOCAN data for new cancer cases.

	<b>New Cancer Cases</b>	<b>Linacs / Co 60 Megavolt Units</b>	<b># of Brachytherapy units</b>	<b># CT simulators</b>	<b># of treatment planning computers</b>	<b># of dosimetry/QA package</b>
La Habana	7418	9	5	5	5	5
Santiago de Cuba	1515	2	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.