

## HUMAN RESOURCES FOR TREATING NEW CANCER CASES IN MOROCCO

### Executive Summary

The purpose of this report is to describe the human resources needed in Morocco to treat new cancer patients. The population of Morocco is approximately 32.6 million (15.96 million men and 16.64 million women) and the estimated number of new cancer cases in Morocco for the year 2012, based on GLOBOCAN data (<http://globocan.iarc.fr/>) for Morocco as a whole was 35018 (16829 in men and 18189 in women) (Table A).

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

Table A: The ten most frequently occurring cancers in Morocco 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	35018		16829		18189	
Breast	6650	1			6650	1
Urological	4519	2	4150	1	369	9
Lung	3928	3	3497	2	431	7
Hematological	3746	4	2219	3	1527	4
Gynecological	3458	5			3458	2
Head and Neck	3453	6	1869	4	1584	3
Colorectal	2484	7	1358	5	1126	5
Stomach	1176	8	705	6	471	6
Brain, nervous system	897	9	496	7	401	8
Pancreas	551	10	340	8	211	11
Gallbladder	463	11	209	10	254	10

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 Morocco's 2 most populous regions based on 2010 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	Neuro-Oncologists	Pathologists
Greater Casablanca	3823000	4107	2 <sup>‡</sup>	5	21	2	2 <sup>‡</sup>	2 <sup>‡</sup>	9
Souss - Massa - Drâa	3381000	3632	2 <sup>‡</sup>	4	19	2	2 <sup>‡</sup>	2 <sup>‡</sup>	8

<sup>‡</sup>At least 2 are needed in each region.

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 Morocco's 2 most populous regions based on 2010 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
Greater Casablanca	4107	80	4	16	24	9	60
Souss - Massa - Drâa	3632	70	3	12	18	8	45

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 Morocco's 2 most populous regions based on 2010 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>
Greater Casablanca	4107	21	30	10	3	10
Souss - Massa - Drâa	3632	19	27	9	3	9

Table E: Radiation Therapy Equipment needed for Morocco's 2 most populous regions based on 2010 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>
Greater Casablanca	4107	5	3	3	3	3
Souss - Massa - Drâa	3632	5	3	3	3	3

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.