

HUMAN RESOURCES FOR TREATING NEW CANCER CASES IN NEPAL

Executive Summary

The purpose of this report is to describe the human resources needed in Nepal to treat new cancer patients. The population of Nepal is approximately 31.01 million (15.38 million men and 15.63 million women) and the estimated number of new cancer cases in Nepal for the year 2012, based on GLOBOCAN data for Nepal as a whole (<http://globocan.iarc.fr/>) was 18802 (8406 in men and 10396 in women) (Table A).

The five most common cancers in Nepal are (1) gynecological (cervix uteri, corpus uteri and ovary), (2) lung, (3) head and neck (lip, oral cavity, nasopharynx, other pharynx, larynx and thyroid), (4) hematological malignancies (Hodgkin lymphoma, non-Hodgkin lymphoma, multiple myeloma and leukemia) and (5) breast.

Table A: The ten most frequently occurring cancers in Nepal for men and women based on 2012 GLOBOCAN data (<http://globocan.iarc.fr/>).

Cancer	BOTH SEXES		MEN		WOMEN	
	Incidence	Rank	Incidence	Rank	Incidence	Rank
All cancers excl. non-melanoma skin cancer	18802		8406		10396	
Gynecological	3132	1			3132	1
Lung	2499	2	1310	2	1189	3
Head and Neck	2423	3	1686	1	737	4
Hematological	1843	4	1162	3	681	5
Breast	1716	5			1716	2
Stomach	1126	6	675	4	451	7
Gallbladder	904	7	331	7	573	6
Urological	806	8	642	5	164	10
Colorectal	698	9	366	6	332	8
Esophagus	504	10	328	8	176	9

Brain, nervous system	319	11	186	9	133	11
Pancreas	198	12	88	11	110	12
Liver	186	13	109	10	77	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 Nepal's 2 most populous zones 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
Bagmati	3843596	2331	2 [✧]	3	12	2 [✧]	2 [✧]	5
Narayani	2975908	1805	2 [✧]	2	10	2 [✧]	2 [✧]	4

[✧]At least 2 are needed in each zone.

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 Nepal's 2 most populous zones based on 2011 population estimates and 2012 GLOBOCAN data for new cancer cases.

	New Cancer	Maximum # of	# of 24 bed	Onco-	Onco-Pharmacy	Palliative Care	Oncology Nursing Staff
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	Cases	beds/day	oncology wards	Pharmacists	Technicians	Specialists	other than Radiation Oncology Nurses
Bagmati	2331	42	2	8	12	5	30
Narayani	1805	32	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 Nepal's 2 most populous zones 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
Bagmati	2331	12	17	6	2	6
Narayani	1805	10	13	5	2	5

Table E: Radiation Therapy Equipment needed for Nepal's 2 most populous zones 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
Bagmati	2331	3	2	2	2	2
Narayani	1805	3	2	2	2	2

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.