

HUMAN RESOURCES FOR TREATING NEW CANCER CASES IN CHINA

Executive Summary

The purpose of this report is to describe the human resources needed in China to treat new cancer patients. The population of China is approximately 1.36 billion (706.48 million men and 654.88 million women) and the estimated number of new cancer cases in China for the year 2012, based on GLOBOCAN data (<http://globocan.iarc.fr/>) for China as a whole was 3065438 (1822769 in men and 1242669 in women) (Table A).

The five most common cancers in China are (1) lung, (2) stomach, (3) liver, (4) colorectal and (5) esophagus.

Table A: The ten most frequently occurring cancers in China 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	3065438		1822769		1242669	
Lung	652842	1	459495	1	193347	1
Stomach	404996	2	283487	3	121509	4
Liver	394770	3	293318	2	101452	6
Colorectal	253427	4	146528	5	106899	5
Esophagus	223306	5	160436	4	62870	7
Breast	187213	6			187213	2
Urological	171324	7	135737	6	35587	10
Gynecological	169454	8			169454	3
Head and Neck	127510	9	72258	8	55252	8

Hematological	121373	10	72528	7	48845	9
Pancreas	65727	11	39299	9	26428	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 China's 2 most populous cities 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	Pathologists
Shanghai	20217748	45526	4	41	228	6	6	92
Beijing	16446857	37035	3	33	186	5	5	75

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 China's 2 most populous cities 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
Shanghai	45526	761	32	128	192	92	480
Beijing	37035	619	26	104	156	75	390

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 China's 2 most populous cities based on 2010 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
Shanghai	45526	228	306	102	26	102
Beijing	37035	186	249	83	21	83

Table E: Radiation Therapy Equipment needed for China's 2 most populous cities based on 2010 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
Shanghai	45526	51	26	26	26	26
Beijing	37035	42	21	21	21	21

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.