

HUMAN RESOURCES FOR TREATING NEW CANCER CASES IN UKRAINE

Executive Summary

The purpose of this report is to describe the human resources needed in Ukraine to treat new cancer patients. The population of Ukraine is approximately 44.94 million (20.67 million men and 24.27 million women) and the estimated number of new cancer cases in Ukraine for the year 2012, based on GLOBOCAN data (<http://globocan.iarc.fr/>) for Ukraine as a whole was 140999 (69199 in men and 71800 in women) (Table A).

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

Table A: The ten most frequently occurring cancers in Ukraine 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	140999		69199		71800	
Colorectal	19049	1	9269	3	9780	3
Urological	17411	2	14376	1	3035	8
Lung	17251	3	14178	2	3073	7
Breast	16471	4			16471	1
Gynecological	16197	5			16197	2
Stomach	11373	6	6835	5	4538	4
Head and Neck	10983	7	7579	4	3404	6
Hematological	7410	8	3797	6	3613	5
Pancreas	4728	9	2546	7	2182	9
Melanoma of skin	2792	10	1081	10	1711	10
Brain, nervous system	2526	11	1322	9	1204	11
Esophagus	1879	12	1620	8	259	14
Liver	1567	13	904	11	663	13

Gallbladder	1036	14	360	12	676	12
Kaposi sarcoma	84	15	49	13	35	15

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 Ukraine's 2 most populous cities based on 2014 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
Kyiv	2868702	9001	2 [‡]	10	46	3	3	19
Charkiv	1451132	4553	2 [‡]	5	23	2	2	10

[‡]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 Ukraine's 2 most populous cities based on 2014 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 other
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	Cases	beds/day	oncology wards	Pharmacists	Technicians	Specialists	than Radiation Oncology Nurses
Kyiv	9001	160	7	28	42	19	105
Charkiv	4553	81	4	16	24	10	60

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 Ukraine's 2 most populous cities based on 2014 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
Kyiv	9001	46	60	20	5	20
Charkiv	4553	23	31	11	3	11

Table E: Radiation Therapy Equipment needed for Ukraine's 2 most populous cities based on 2014 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
Kyiv	9001	10	5	5	5	5
Charkiv	4553	6	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.