

## HUMAN RESOURCES FOR TREATING NEW CANCER CASES IN RUSSIA

### Executive Summary

The purpose of this report is to describe the human resources needed in Russia to treat new cancer patients. The population of Russia is approximately 142.7 million (65.99 million men and 76.71 million women) and the estimated number of new cancer cases in Russia for the year 2012, based on GLOBOCAN data for Russia as a whole (<http://globocan.iarc.fr/>) was 458382 (215418 in men and 242964 in women) (Table A).

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

Table A: The ten most frequently occurring cancers in Russia 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	458382		215418		242964	
Urological	61381	1	49927	1	11454	7
Colorectal	59928	2	26745	3	33183	3
Breast	57502	3			57502	1
Lung	55805	4	45599	2	10206	8
Gynecological	49687	5			49687	2
Stomach	38417	6	21837	4	16580	4
Head and Neck	31395	7	18790	5	12605	6
Hematological	25137	8	12108	6	13029	5
Pancreas	14512	9	7206	7	7306	9
Melanoma of skin	8717	10	3212	11	5505	10
Brain, nervous system	7377	11	3762	10	3615	11
Esophagus	7263	12	5723	8	1540	14
Liver	6812	13	3848	9	2964	12

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 Russia’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
Moscow	11971664	38455	5	42	193	11	9	77
Saint-Peterburg	5131942	16485	2	18	83	5	4	33

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 Russia’s 2 most populous cities based on 2014 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
Moscow	38455	682	29	116	174	77	435

Saint-Peterburg	16485	293	13	52	78	33	195
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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 Russia’s 2 most populous cities based on 2014 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>
Moscow	38455	193	254	85	22	85
Saint-Peterburg	16485	83	109	37	10	37

Table E: Radiation Therapy Equipment needed for Russia’s 2 most populous cities based on 2014 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>
Moscow	38455	43	22	22	22	22
Saint-Peterburg	16485	19	10	10	10	10

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.