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Cancer Profile in East Jakarta: A 5-year descriptive study

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Abstract

Background: Global Burden of Cancer (GLOBOCAN) 2012 estimated there were 8.2 million cancer deaths worldwide, 65% of them were in developing countries. In Indonesia, the cancer incidence is 134 per 100,000 population. The magnitude of the burden caused by cancer requires a valid data collection in each country in an effort to plan and evaluate cancer prevention programs in the future. Based on Indonesian Minister of health decree, Dr. Cipto Mangunkusumo Hospital (RSCM) was determined as Cancer Registry Control Center in DKI Jakarta Province. This study aims to report Cancer Profile in East Jakarta 2008-2012 based on RSCM Data.

Methods: This research was a cross-sectional descriptive study. Patient data were extracted from DKI Jakarta Cancer Registry Control Center Located at RSCM. The primary site and histology of malignancies were identified and coded based on the International Classification of Diseases for Oncology.

Results: There were 3748 cancer patients who live in East Jakarta, with male and female ratio of 1:1.9. Most of them were between 45-54 years old. The majority of patients came to health providers with advanced stage (stage 3 and 4). At both sexes the most frequent cancer were breast cancer, followed by cervical cancer, hematopoietic and reticuloendothelial system malignancy, nasopharyngeal cancer, and lung and bronchial cancer. The five most common cancers in men were nasopharyngeal cancer, hematopoietic and reticuloendothelial system malignancy, lung and bronchial cancer, liver and intrahepatic bile duct cancer, and lymph node cancer, respectively. While in women, the five most common cancers were breast cancer, cervical cancer, ovarian cancer, hematopoietic and reticuloendothelial system malignancy and thyroid gland cancer, respectively.

Conclusion: Most of cancer patients are in productive age and the majority of them came at advanced stage. Furthermore, three of five most common cancer charge both genders (hematopoietic and reticuloendothelial system malignancy, nasopharyngeal cancer, and lung and bronchial cancer).

Keywords: Cancer, cancer profile, cancer registration, East Jakarta

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INTRODUCTION

Currently cancer has become the second leading cause of death in developed countries and the third cause of death in developing countries.¹ Global Burden of Cancer (GLOBOCAN) 2012 estimated there were 8.2 million cancer deaths worldwide, 65% of them were in

developing countries. In Indonesia, the cancer incidence was 134 per 100.000 population.^{1,2} In November 2014 the Health Insurance Organizing Agency (*Badan Penyelenggara Jaminan Sosial (BPJS)*) reported that the cost of cancer patients reached 1.5

trillion rupiah, and from this amount, around 905 billion rupiah was used for outpatient and inpatient costs, 589 billion rupiah for medical drugs and 44 billion rupiah for promotional and preventive efforts.³

The magnitude of the burden caused by cancer requires a valid data collection in each country in an effort to plan and evaluate cancer prevention programs in the future. Valid data can be generated through a cancer registration process that avoids duplication of data where one cancer case is only recorded once in a lifetime.⁴ Therefore, this study aims to report Cancer Profile in East Jakarta 2008 - 2012 based on Cipto Mangunkusumo Hospital (RSCM) data as Cancer Registry Control Center in DKI Jakarta Province.

METHODS

This research was a cross-sectional descriptive study. Patient data were extracted from Jakarta Cancer Registry Control Center located at Cipto Mangunkusumo Hospital (RSCM). Data collected from multiple hospitals within East Jakarta. The primary site and histology of malignancies were identified and coded based on the International Classification of Diseases for Oncology (ICD-O).

The study sample included all cancer patients registered in the DKI Jakarta Provincial Health Service Facility from January 1, 2008 to December 31, 2012 domiciled in East Jakarta. The research subjects were taken by the total sampling method from the DKI Jakarta Province cancer registration data in 2008-2012, and the number of samples obtained collectively based on data from cancer patients. The inclusion criteria were all patients diagnosed with cancer based on anatomical pathology examination or other investigations recorded at the DKI Jakarta Provincial Health Service Facility within the period of January 1, 2008 to December 31, 2012 domiciled in the East Jakarta Region. There were no exclusion criteria in this study.

Statistical analysis using descriptive method was used to find the frequency and distribution of cancer based on age, sex, occupation, tumor location, stage and morphology using SPSS 20.0 software.

RESULT

Based on DKI Jakarta Province cancer registration data from 2008-2012, there were 14.726 cases of cancer patients. After screening and deleting duplicated data, 3.748 cases of cancer patients domiciled in the East

Jakarta Region or around 25.5% of all cancer patients in DKI Jakarta Province in 2008-2012 were obtained.

Frequency of Cancer in East Jakarta Region from 2008-2012

Based on the results, data related to incidence of cancer per year compared to the population was equal to 0.28%. The population continued to increase from year to year, the highest increase in cases occurred in 2010 at 10%. The frequency of cancer each year also increased with the highest increase in 2012 at 19.1% (**Figure 1**).

Characteristic Profile of Cancer Patients in East Jakarta Region from 2008-2012

Of the 3.748 cases of cancer patients domiciled in the East Jakarta Region from 2008-2012, the number of female patients was 2.442 cases (65.2%) compared to male 1.306 cases (34.8%) (**Table 1**). The highest incidence of cancer in the East Jakarta Region from 2008-2012 was in the age group 45-54 years (27%), followed by the age group 55-64 years (21.3%) and the age group 35-44 years (19.5%) (**Table 1**).

Of all patients whose stage was known and applicable (1.159 cases of cancer), 562 (48.5%) patients present with stage 3, 225 (19.4%) with stage 4, 203 (17.5%) with stage 2 and 169 (14.6%) patients with stage 1. From the results obtained, it was known that most cancer patients come at an advanced stage (stages 3 and 4) (**Figure 2**).

Five most common Cancer Disease in East Jakarta Region from 2008-2012 in Male and Female

The five most common cancers in both sexes were breast cancer (729, 19.5%), cervical uterine cancer (410, 10.9%), hematopoietic and reticuloendothelial system malignancy (241, 6.4%), nasopharyngeal cancer (192, 5.1%) and lung and bronchial cancer (179, 4.8%) (**Figure 3**).

The five most common cancers in male patients were nasopharyngeal cancer (134, 10.3%), hematopoietic and reticuloendothelial system malignancy (129, 9.9%), lung and bronchial cancers (121, 9.3%), intrahepatic ducts and hepatic biliary (84, 6.4%) and lymph node cancer (75, 5.7%). The five most common cancers in female patients were breast cancer (719, 29.4%), cervical uterine cancer (410, 16.8%), ovarian cancer (178, 7.3%), hematopoietic and reticuloendothelial system malignancy (112, 4.6%) and cancer of the thyroid gland (88, 3.6%) (**Table 2**).

Age and Gender Distribution in the Five Most Common Cancer Disease in the East Jakarta Region 2008-2012

In breast cancer, cervical uterine cancer, and nasopharyngeal cancer, the highest frequency of cancer was in the 45-54 years old group, for the hematopoietic and reticuloendothelial system malignancy was in the <5 years old group, while the most frequent lung and bronchial cancers were in the 55-64 years old group (**Figure 4**)

In breast cancer there were only 1.4% of male patients, while nasopharyngeal cancer, lung and bronchial cancer were found more common in men with a ratio of about 2:1. For hematopoietic and reticuloendothelial system malignancies the distribution was almost identical between both genders. Nasopharyngeal, lung and bronchial cancer were more prevalent among male patients, with rates reaching more than double the number of female patients.

Morphological Distribution of the Five Most Common Cancer in East Jakarta Region 2008-2012

Based on morphological distribution, the most common morphology in breast cancer was invasive ductal carcinoma (42%). In cervical uterine cancer, the most common morphology is non keratinizing squamous cell carcinoma (27.3%). While in nasopharyngeal cancer, the most common morphology is undifferentiated carcinoma (25%). The most common morphology of hematopoietic and reticuloendothelial system malignancies is lymphoblastic precursor leukemia (22,8%), while in lung and bronchial cancer, the most common morphology was adenocarcinoma (49.7%) (**Table 3**).

DISCUSSION

According to GLOBOCAN 2012 data, Indonesia estimated incidence of cancer in men is 138,800 (46.3%) and in women 160,800 (53.7%). In this study results, it was found that the ratio of cancer incidence in male and female was 1:1.9, when compared with Southeast Asian data the number of male patients is also less than female patients with a ratio of 1: 1.05.⁵

Based on the age group, the highest incidence of cancer in the East Jakarta Region in 2008-2012 was in the age group 45-54 years (27%), followed by the age group 55-64 years (21.3%) and the age group 35-44 years (19.5 %). This finding is quite different with the cancer data in Singapore year 2008-2012 where the highest age group in cancer patients is 60-65 years followed by the age group 55-60 years and 70-75 years.⁶ Meanwhile

from the world cancer incidence data based on GLOBOCAN 2012 most cancer patients were found in the age group above 75 years, followed by the age group 65-69 years and 60-64 years.¹

From the results obtained, it is known that most cancer patients come at an advanced stage (stages 3 and 4). However, data related to the stage of cancer is still minimal. This information can later be used as one of the points of consideration to assess the success of the management of cancer patients and as a reference in developing cancer prevention strategic steps.

Result of this study about five most common cancers is quite different from ASEAN and world report, where hematopoietic and reticuloendothelial system malignancy and nasopharyngeal cancer were not mentioned as the five most common cancers. Based on GLOBOCAN 2012, for the ASEAN region, the highest frequency is occupied by breast cancer, followed by lung cancer, liver cancer, colorectal cancer and cervical cancer.⁷ While in the world report, breast cancer also ranks first, followed by prostate cancer, lung cancer, colorectal cancer and cervical cancer.⁵

Based on the results above, the highest age group for breast cancer was 45-54 years. This result is quite similar to the study from Leong et al., that states that there are differences in the peak age of breast cancer between Asian countries when compared to Western countries. In Asia the peak age of breast cancer is in the age group of 40-50 years while in the Western countries the peak age is in the higher age group of 60-70 years.⁸

Similar to breast cancer, cervical cancer patient was also found more common in 45-54 age groups. This finding is similar to research conducted by Kim et al in China that show the highest age group in cervical cancer patients was 44-55 years.⁹

The severity of the hematopoietic and reticuloendothelial system malignancy in the East Jakarta Region in 2008-2012 was highest in the age group less than 5 years. This result is in line with world data which states that the most common age group in the hematopoietic system malignancy occurs in the age group 2-5 years.¹⁰

Based on the current study results, it is known that the highest frequency of nasopharyngeal cancer occurs only in the 45-54 years age group. It is different with a study conducted by Bray et al., which states that there are two peak age groups in nasopharyngeal cancer, namely in the age group 15-24 years and the age group 65-79 years.¹¹

For lung cancer cases based on 2012 GLOBOCAN data the highest incidence was at the age above 75

years, followed by the age group 65–69 years and the age group 70–74 years.⁵ While the highest distribution of lung and bronchial cancer in the East Jakarta Region in year 2008–2012 was found younger, at the age group of 55–64 years.

Result of the study shows that the number of male patients in breast cancer were 1.4% of total cases. This number was higher from data released by the State of Malaysia in 2007 that there were as many as 0.8% of breast cancer male patients.¹²

Nasopharyngeal cancer and lung and bronchial cancer are more common in men with a ratio of about 2:1. The numbers are quite similar when compared to Malaysia and Singapore. In Malaysia around 72.9% of nasopharyngeal cancer patients and 70.7% of lung cancer patients are male, while in Singapore the proportion of male patients in nasopharyngeal cancer is 75.6% and lung cancer is 65.5%.^{6,12}

Based on morphological distribution, the most common morphology in breast cancer in the East Jakarta Region in 2008–2012 was invasive ductal carcinoma (42%). This is in line with the study of Malhotra et al which states that 70–80% of the morphology of invasive breast cancer is invasive ductal carcinoma.¹³

In cervical uterine cancer, the highest morphology was unspecified histopathology, malignant neoplasm (28.3%). Malaysian data in 2007 found that the most common morphology found in cervical cancer was squamous cell carcinoma (29.8%), followed by non-keratinized squamous cell carcinoma (18.8%) and adenocarcinoma (17.1%).¹²

For hematopoietic and reticuloendothelial system malignancies, the most common morphology found is lymphoblastic cell precursor leukemia (22.8%), Data from Malaysia in 2007 found the highest morphology for malignancy of the hematopoietic system was acute myeloid leukemia (29.9%), lymphoblastic cell precursor leukemia (19.3%) and acute leukemia (14.4%).¹²

Most cases of nasopharyngeal cancer have morphology of malignant neoplasms that are not histopathologically specific (26.6%). In comparison in Malaysia in 2007, the most common morphology of nasopharyngeal cancer was undifferentiated carcinoma (35.9%), carcinoma (27%) and non-keratinized squamous cell carcinoma (11.4%).¹²

The most common morphology in the case of lung and bronchial cancer is adenocarcinoma (49.7%), not much different from Malaysian data in 2007 where the most common lung cancer morphology was adenocarcinoma (29%), carcinoma (17.1%) and squamous cell carcinoma (16%).¹²

Based on the current study, it could be concluded that many of cancer patients were in productive age and majority of them came at advanced stage. Furthermore, three of five most common cancers charge both genders, of which are hematopoietic and reticuloendothelial system malignancy, nasopharyngeal cancer, and lung and bronchial cancer.

LIMITATIONS

Data related to the stage of cancer is still minimal even though this information can later be used as one of the points of consideration to assess the successfulness of cancer patients management and as a reference in developing cancer prevention strategic steps. In addition to the stadium, information on the types of cancer histopathology is also not specific, therefore many cancers are morphologically categorized as malignant neoplasm.

This study is part of a cancer profile study in the DKI Jakarta Region in 2008–2012. Hopefully, this research can provide information about the burden of cancer which will be the basis for planning and evaluation of a more comprehensive cancer management program which includes promotive, preventive, curative and rehabilitative. In addition, this research can add references to further studies, especially in the field of population-based cancer registration.

CONFLICT OF INTEREST

None Declared.

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Patient demographic	Number of patients	% of Patients
Gender		
Male	1306	34.8
Female	2442	65.2
Age		
<5	92	2.4
5-14	89	2.4
15-24	137	3.7
25-34	324	8.6
35-44	731	19.5
45-54	1013	27
55-64	798	21.3
65-74	448	12
>75	116	3.1
Occupation		
Office worker	360	9.6
Farmer	3	0.1
Laborer	49	1.3
Policeman / Army	11	0.3
House wife	716	19.1
Medical Personnel	3	0.1
Teacher	11	0.3
Entrepreneur	54	1.4
Others	1141	30.4
Unknown	1400	37.4
Stage		
1	72	2
1A	24	0.6
1B	50	1.3
1C	23	0.6
2	26	0.7
2A	68	1.8
2B	108	2.9
2C	1	0
3	287	7.7
3A	37	1
3B	204	5.4
3C	34	1
4	196	5.2
4A	0	0
4B	24	0.6
4C	5	0.1
Not measured	289	7.7
Unknown	2300	61.4

Table 1. Cancer Patient Demographics in East Jakarta 2008 - 2012

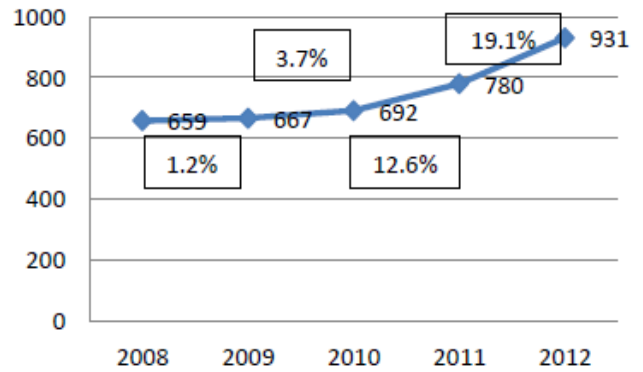


Figure 1. Cancer frequency chart of the East Jakarta Region in 2008–2012

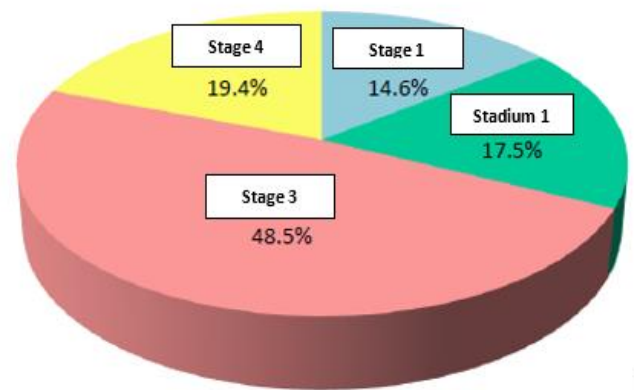


Figure 2. Distribution of cancer patients based on the stage

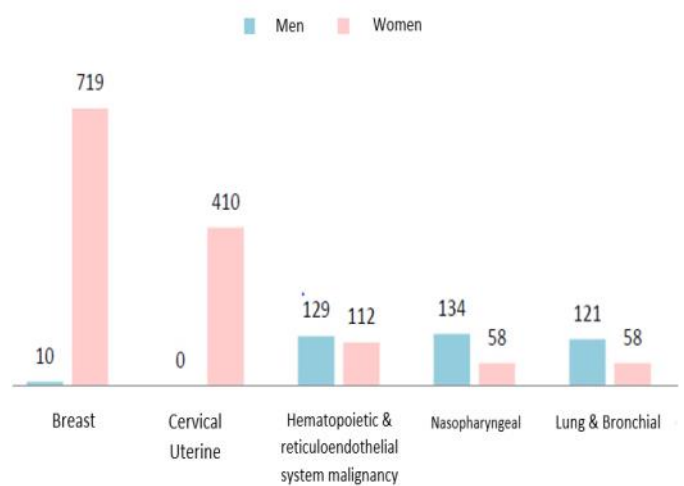


Figure 3. Distribution of five most common cancer based on gender

Table 2. Distribution of five most common cancer in East Jakarta 2008-2012 based on gender

Male				Female		
No	Topography	Frequency	Percentage (%)	Topography	Frequency	Percentage (%)
1	Nasopharynx	134	10.3	Breast	719	29.4
2	HRS malignancies ¹	129	9.9	Cervix uteri	410	16.8
3	Lung and bronchial	121	9.3	Ovary	178	7.3
4	Liver	84	6.4	HRS malignancies ¹	112	4.6
5	Lymphoma	75	5.7	Thyroid	88	3.6

¹HRS malignancies: hematopoietic and reticuloendothelial system malignancy

Table 3. Distribution of five most common cancer in East Jakarta 2008-2012 based on cancer morphology

Topography	Morphology	Frequency (n)	Percentage (%)
Breast	Invasive ductal carcinoma	306	42
	Malignant neoplasm	234	32.1
	Carcinoma	55	7.5
	Lobular carcinoma	32	4.4
	Phyllodes malignant tumor	18	2.5
	Others	75	10.3
	Unknown	9	1.2
Cervix uteri	Malignant neoplasm	116	28.3
	Squamous cell carcinoma, non-keratinizing	112	27.3
	Squamous cell carcinoma, keratinizing	52	12.7
	Adenocarcinoma	40	9.7
	Carcinoma	29	7.1
	Others	61	14.9
HRS Malignancies ¹	Precursor cell lymphoblastic leukemia	55	22.8
	Acute Myelogenous Leukemia	38	15.8
	Chronic Myelogenous Leukemia	33	13.7
	Multiple Myeloma	14	5.8
	Acute Leukemia	13	5.4
	Others	82	34
	Unknown	6	2.5
Nasopharynx	Malignant neoplasm	51	26.6
	Undifferentiated carcinoma	48	25
	Squamous cell carcinoma, non-keratinizing	39	20.3
	Carcinoma	36	18.8
	Squamous cell carcinoma	7	3.6
	Others	11	5.7
Lung and bronchus	Adenocarcinoma	89	49.7
	Malignant neoplasm	27	15.1
	Squamous cell carcinoma	19	10.6
	Carcinoma	10	5.6
	Small cell carcinoma	8	4.5
	Others	21	11.7
	Unknown	5	2.8

¹HRS malignancies: hematopoietic and reticuloendothelial system malignancy

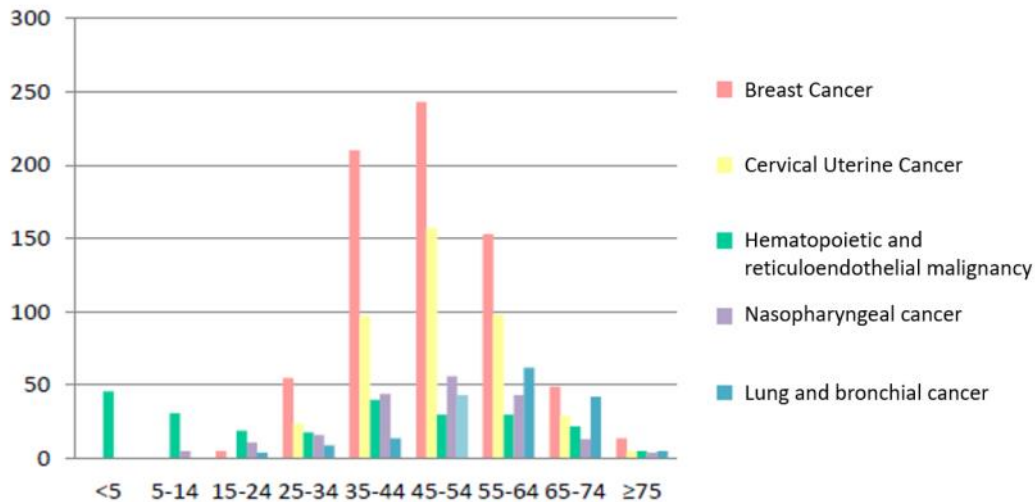


Figure 4. Distribution of five most common cancer based on gender

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