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Cancer Profile in North Jakarta and Kepulauan Seribu : A 5-year descriptive study

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Abstract

Background: Cancer is the leading causes of death with a comparable number of mortality rate to coronary heart disease and stroke. The burden of cancer will continue to increase, especially in developing countries including Indonesia. This study reports the profile of cancer patients domiciled in the administrative area of North Jakarta and Kepulauan Seribu in 2008 – 2012.

Materials and Methods: This was a descriptive study. Patients data were collected from cancer registries all hospitals located in administrative area of North Jakarta and Kepulauan Seribu. This data was pooled and extracted from DKI Jakarta Cancer Registry Control Center at RSCM. The primary site and histology of malignancies were verified and coded based on the International Classification of Diseases for Oncology (ICD-O). Data were analyzed using descriptive statistics in SPSS 20.0

Results: There are 2185 cases or around 14.8% of all cases of cancer patients verified in the database. Of those, 740 were male and 1445 female. The most prevalent age group was 45 - 54 years old, which was 29%. The highest distribution of cancer stage was in stage 3, which is 21.1%. The most common cancer in all sex groups were breast cancer, cervical cancer, nasopharyngeal cancer, hematopoietic system malignancy, and ovarian cancer. In men, the top five most cancers were nasopharyngeal cancer, lung cancer, hematopoietic system, lymphoma, and liver cancer. Whereas in women, most cancer sequences were breast cancer, cervical cancer, ovarian cancer, thyroid cancer, and hematopoietic system.

Keywords: Cancer, Cancer registry, DKI Jakarta, North Jakarta, Kepulauan Seribu

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INTRODUCTION

Neoplasm is an abnormal, uncontrolled cell growth and development due to a process that interferes with the body's cell division regulation system. Neoplasms can continue to grow to form a mass called a tumor. Some tumors, also called as malignant neoplasms or cancer, could infiltrate and damage surrounding tissues or even other tissues in locations far from tumor growth sites.¹ Cancer is a problem in every country because it is one of the biggest causes of death, especially in developing countries.²

Global Burden of Cancer (GLOBOCAN 2012) data shows that there were 14.1 million new cancer cases

and 8.2 million cancer deaths in 2012. From these data, it was found that developing countries responsible for 57% of cancer cases and 65% of deaths. This number is expected to reach around 21.4 million new cases and 13.2 million cancer deaths in 2030.³ Meanwhile, based on the 2012 GLOBOCAN data, the incidence of cancer in Indonesia reaches 134 per 100,000 population.⁴ Whereas from the data results 2013 Basic Health Research found the prevalence of cancer in Indonesia was 1.4 per 1000 population.⁵

Cancer does not only cause a health burden, but also creates a significant economic burden. Data from the

Indonesia Universal Health Coverage (UHC) in 2015, reported that treatment for cancer took approximately 2.294 trillion rupiah with 1,325,776 cases. The future burden of cancer is predicted to increase, especially in developing countries. This may due to the cancer risk related lifestyle such as smoking, unhealthy diets, and lack of physical activity.⁵

In 2007, Indonesia has started implementing the population-based cancer registry (PBCR) to collect cancer data with the DKI Jakarta Province acting as a pilot project. This PBCR data will provide information about cancer burden in certain populations, both morbidity (prevalence and incidence) and mortality which will be the basis for planning and evaluating cancer prevention programs at the regional to national level.⁶ This study aims to provide an overview of cancer profiles in North Jakarta and Kepulauan Seribu from 2008-2012 based on the data from DKI Jakarta Cancer Registry.

METHODS

A descriptive study was carried out using a cross-sectional design. Data collection was conducted retrospectively by using cancer registration data from various hospitals in North Jakarta and Kepulauan Seribu Administrative District, DKI Jakarta Province. Data was collected by cancer registry office located in Cipto Mangunkusumo National General Hospital from May 2017 to June 2017. The study used a total sampling method to all patients diagnosed with cancer based on anatomical pathology examination and other examinations. Data was recorded in medical record health facilities in the DKI Jakarta Province during the period of January 1st, 2008 to December 31st, 2012. This study did not have exclusion criteria. Several data were collected in this study, including the frequency of cancer, demographic data (age, sex, and occupation), frequency of cancer location according to ICD-O, cancer stage, morphology and cancer histology type. Descriptive analysis was carried out using the SPSS version 20.0.

RESULTS

There were 2,185 cancer cases (duplicate-free) originating from North Jakarta and Kepulauan Seribu during the period 2008-2012. Based on profile data of cancer patients in the North Jakarta and Kepulauan Seribu, this number covers around 14.8% of all cases of cancer patients recorded in cancer registrations in DKI Jakarta Province.

Based on gender, the distribution of cancer is twice as common in women than men (66.1% and 33.9% respectively). Meanwhile, the highest cancer incidence

was found in the age group of 45-54 years (631 cases; 28.9%), 35-44 years (449 cases; 20.5%) and 55-64 years (402 cases; 18.39 %). Regarding the patient's location, cancer cases are far more frequents in the North Jakarta region compared to Kepulauan Seribu. (**Figure 1**) The highest cancer incidence was found in housewives which included as many as 27.6%, followed by office staff workers 6.5%, traders 2.1%, and factory workers 1.7% cases. A total of 659 (30.2%) cancer patients had other employment statuses, and as many as 31.3% patients had unknown employment status. Regarding the stage of cancer, the data showed that most patients came with stage III cancer (462 cases), followed by stage II with 157 (7.2%) cases, stage I with 148 (6.8%) cases, and stage IV with a total of 145 (6.7%) cases. As many as 150 (6.8%) patients with a diagnosis of blood, meningeal, central nervous system (CNS) and endocrine glands cancer were grouped in not applied stages (**Table 2**).

Table 1. Yearly frequency of cancer patients in the North Jakarta and Kepulauan Seribu

Year	Frequency (n)	Percentage (%)
2008	444	20,3
2009	360	16,5
2010	406	18,6
2011	482	22,0
2012	493	22,6

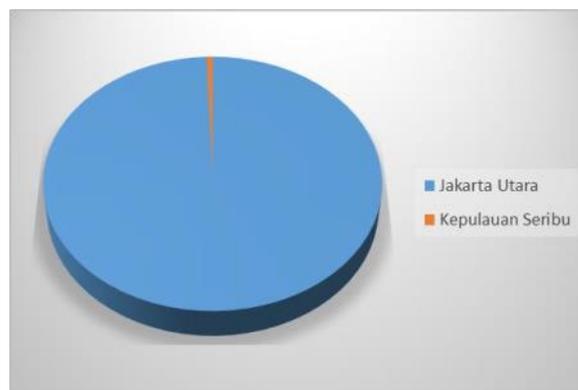


Figure 1. Distribution of cancer patients by residence

Distribution of Cancer Based on Tumor Location (according to ICD-O)

Of the 2,185 cancer cases found in the North Jakarta and Kepulauan Seribu regions during the period of 2008-2012, 57 topographies were based on ICD-O (**Table 3**). In general, breast cancer 21.9%, uterine cervical cancer 13.3%, nasopharyngeal cancer 5.9%, cancer of the hematopoietic and reticuloendothelial system 5,6%, and ovarian cancer 5.4% were the five frequent cancer cases in the North Jakarta and Kepulauan Seribu Administratice District.

Table 2. Patient Characteristic

Character-istic		Frequency (n)	Percentage (%)
Gender	Male	740	33,9
	Female	1445	66,1
Age Group	<5	65	3,0
	5-14	48	2,2
	15-24	73	3,3
	25-34	206	9,4
	35-44	449	20,5
	45-54	631	29,0
	55-64	402	18,4
	65-74	237	10,8
	≥75	74	3,4
	Occupation	Office	142
Workers			
Farmer		5	0,2
Factory		38	1,7
Workers			
TNI/Police		3	0,1
Housewife		603	27,6
Medical		3	0,1
Personnel			
Teacher		2	0,1
Stage	Traders	46	2,1
	Others	659	30,2
	Unknown	684	31,5
	1	81	3,7
	1A	15	0,7
	1B	52	2,4
	2	21	1,0
	2A	49	2,2
	2B	87	4,0
	3	262	12
3A	21	0,9	
3B	129	5,9	
3C	50	2,3	
4	121	5,5	
4A	1	0,0	
4B	19	0,9	
4C	4	0,2	
Not applied	150	6,9	
Unknown	1123	51,4	

Table 3. Number of cases based on ICD O

Topography	Frequency (n)	Percentage (n)
Breast (50)	478	21.9
Cervix Uteri (53)	290	13.3
Nasopharynx (11)	130	5.9
Hematopoietic and Reticulo- endothelial systems (42)	123	5.6
Ovarium (56)	118	5.4
Bronchus and lung (34)	112	5.1
Thyroid (73)	83	3.8
Lymph Nodes (77)	84	3.8
Colon (18)	76	3.5
Liver and intrahepatic bile ducts (22)	74	3.4

Rectum (20)	57	2.6
Skin (44)	53	2.4
Nasal cavity and middle ear (30)	46	2.1
Connective, subcutaneous and Other soft tissues (49)	32	1.5
Prostate (61)	30	1.4
Brain (71)	31	1.4
Bones, joints and articular Cartilage of limbs (40-41)	26	1.2
Pancreas (25)	25	1.1
Corpus Uteri (54)	24	1.1
Uterus (55)	23	1.1
Testis (62)	21	1
Bladder (67)	23	1
Tongue (02)	20	0.9
Larynx (32)	20	0.9
Stomach (16)	15	0.7
Accessory sinuses (31)	13	0.6
Kidney (64)	14	0.6
Parotid Gland (07)	10	0.5
Other and ill-defined sites (76)	1	0.5
Palate (05)	8	0.4
Unspecified parts of Mouth (06)	8	0.4
Tonsil (09)	8	0.4
Heart, mediastinum, and pleura (38)	8	0.4
Meninges (70)	9	0.4
Small Intestine (17)	7	0.3
Penis (60)	7	0.3
Esophagus (15)	4	0.2
Other and ill-defined Diges- tive organs (26)	4	0.2
Vulva (51)	5	0.2
Eye and adnexa (69)	4	0.2
Other endocrine glands and related structures (75)	4	0.2
Other and Unspecified Ma- jor Salivary Glands (08)	3	0.1
Oropharynx (10)	2	0.1
Hypopharynx (13)	2	0.1
Gallbladder (23)	2	0.1
Peripheral nerves and auto- nomic Nervous system (47)	2	0.1
Retroperitoneum and Perito- neum (48)	2	0.1
Placenta (58)	3	0.1
Spinal cord, cranial nerves, and Other parts of central	2	0.1
Pharynx (14)	1	0
Anus and Anal Canal (21)	1	0
Other and unspecified Parts of biliary tract (24)	1	0
Thymus (37)	1	0
Vagina (52)	1	0
Other and unspecified Male genital organs (63)	1	0
Ureter (66)	1	0

The five most common cancers based on gender

Based on the registry data, there were differences in types of cancer and the highest incidence based on gender. In men, nasopharyngeal cancer, lung cancer, hematopoietic malignancy, lymphoma, and liver cancer were the five most commonly found cancers with 11.9%, 10.5%, 9.5%, 7.6%, 6.7% retrospectively. Whereas in women, five cancer cases with the highest prevalence respectively were breast cancer 33.1%, cervical cancer 20.1%, ovarian cancer 8.1%, thyroid cancer 4.9%, and hematopoietic system malignancy 3.7%.

DISCUSSION

Of the total number of 2185 cancer patients, there was an increasing trend in terms of number of patients from 2009 to 2012. This is in line with the increase in global cancer incidence rates based on GLOBOCAN where there were 12.7 million new cases in 2008 and 14.1 million new cases in 2012.⁷ Regional population combined North Jakarta and Kepulauan Seribu from 2008 (1,478,783 residents) to 2012 (1,737,784 residents) had a 5-year increase of 17.5%.⁸ Having these data, we can assumed that the increasing number of cancer patients can be occurred due to the changes in the regional population.

In general, cancer patients in the study cohort were mostly female, 1,445 (66.1%) compared to 740 men (33.9%). The imbalance in the number of both gender is caused by breast cancer, which is mostly suffered by women, and cervical and ovarian cancers which only suffered by women, are three of the five highest cancer cases in the North Jakarta and Kepulauan Seribu. When compared with GLOBOCAN 2012 data for cancer cases in Southeast Asia, the number of new cases of cancer in male is less than that of women, with the frequency of 1,237 (38%) cases in men and 2,014 (62%) cases in female.⁷

The results of the analysis of the distribution of patients based on age showed that the age group of 45-54 years, 35-44 years, and 55-64 years were the age with the highest number of cancer cases, namely 631 (28.9%) cases, 449 (20,5%) cases, and 402 (18.39%) cases. This result is not too far compared to the 2012 GLOBOCAN data where the age range of 45-54 years and 55-64 years is the most prevalent age of cancer in Southeast Asia with the percentage of 22.6% and 25.3% respectively.⁷

Table 4. Five most common cancer morphologies.

Cancer Type	Morphology	Frequency (n)	Percentage (%)
Breast Cancer	Ductal Carcinoma Invasive	94	19,5
	Neoplasm	63	13.1
	Lobular Carcinoma	41	8.5
	Carcinoma	30	6.1
	Malignant Phyllodes Tumor	12	2,5
	Others	103	21,5
	Unknown	138	28.8
Cervix	Malignant neoplasm	47	16,2
	Adenocarcinoma	30	10,3
	Non-keratinized squamous cell carcinoma	22	7,6
	Keratinized squamous cell carcinoma	19	6,5
	Adenosquamous Carcinoma	11	3,8
	Others	87	30
	Unknown	74	25,6
Nasopharynx	Undifferentiated carcinoma	23	17.7
	Malignant neoplasm	19	14.6
	Carcinoma	13	10
	Non-keratinizing squamous cell carcinoma	5	3.8
	Keratinizing squamous cell carcinoma	4	3.1
	Others	29	22.3
	Unknown	37	28.5
Hematopoietic Malignancy	Malignant neoplasm	29	23.6
	Precursor lymphoblastic cell leukemia	25	20,3
	Acute myeloid leukemia	9	7,3
	Chronic myeloid leukemia	7	5,7
	Acute leukemia	4	3,3
	Others	22	17,9
	Unknown	27	21,9
Ovarium	Malignant neoplasm	22	18.7
	Undifferentiated carcinoma	18	15.2
	Adenocarcinoma	12	10,1
	Squamous cell carcinoma	6	5.08
	Adenosquamous carcinoma	5	4.2
	Others	29	24.7
	Unknown	26	22.02

Based on the patient's residency, overall, most patients were from North Jakarta (99.4%). This is because North Jakarta has a bigger population than the Kepulauan Seribu. Based on the BPS population data in 2013, the population in the North Jakarta area was 1,715,564 (98.72%) while Kepulauan Seribu were 22,220 (1.28%). In regard to the health access and health facilities, North Jakarta has better facilities than those in Kepulauan Seribu.⁸

Based on job profile, most cancer patients have other occupational status as many as 659 (30.2%) people, followed by housewives, office workers, traders, and factory workers, farmers, military / police, medical personnel, and teachers. Housewives had the highest prevalence due to the number of female and the presence of cervical and breast cancer which is included in the most common cancer. To find a connection between work and cancer, analytic studies are needed to look for causal relationship.

Based on the stage, most of cancer patients came with stage 3 cancer (21.1%). This indirectly can be related to education status. Sharma et al showed that the education system in developing countries is uneven and there are still quite a lot of people whose education level are very low.⁹ It can be assumed that these conditions correlate with the number of cancer patients who come at an advanced stage. Another thing that causes patients to arrive late in health facilities is economic factor barriers. Patients often come late to health care facilities and are more likely to choose alternative treatments as their main treatment before coming to doctor.⁹ However, high number of patients are not recorded well in this study and this may affect the quality of data. Thus, good recording process should accompany the diagnosis made by the medical personnel to achieve a better data quality.

We have carried out a frequency analysis of the morphological types for the five most common types of cancer based on the ICD-O classification system (**Table 4**). In breast cancer, the most common type of histology is invasive ductal carcinoma (19.5%). This is in line with study from Malhotra et al., where of the various types of invasive type breast cancer, the most common type (70-80%) is invasive ductal carcinoma.¹⁰ This data is also in accordance with research by Tjahjadi et al. who found that invasive ductal carcinoma was the highest type of histopathology in Cipto Mangunkusumo Hospital during 1992-1995.¹¹

In cervical cancer, most cases were malignant neoplasms (16.2%). Meanwhile, as many as 25.6% of cervical cancer cases did not have a clear record of histopathological results. Of the various types of cervical

cancer histopathology, the most common type was squamous cell carcinoma, which originates from the squamocolumnar junction that has the characteristics of keratinized and not keratinized. While the type of adenocarcinoma originates from endocervix and only accounts for around 14% of the total cases.

In nasopharyngeal cancer, undifferentiated carcinoma was the most common morphology (17.7%), whereas as many as 22.3% of cases of nasopharyngeal carcinoma were unknown morphology. Based on the WHO classification system, nasopharyngeal carcinoma is classified into type I (Keratinizing Squamous Cell Carcinoma), Type II (Non-Keratinizing Squamous Cell Carcinoma) and type III (undifferentiated carcinoma). The findings in this study are in line with WHO publications which show that type III nasopharyngeal carcinoma is the most common type, especially in Southeast Asia with a high incidence.¹²

In the malignancy of the hemopoietic system, most cases were precursor lymphoblastic cell leukemia (20.3%), whereas as many as 21.9% of cases were unknown. This highest distribution is in accordance with research from Inaba et al. which states that the most types of leukemia in children are acute lymphoblastic leukemia.¹³ In addition, HBCR data from Cipto Mangunkusumo Hospital in 1997-1998 by Sibuea et al. also supports this finding.¹⁴ In ovarian cancer, the most common morphological classification was malignant neoplasms which cover about 18.7%. Meanwhile, as many as 22.02% of cases have unknown morphological status. This is consistent with Yancik's study which states that 93% of ovarian malignancies have histopathological features originating from epithelium (malignant).¹⁵

CONCLUSIONS

This is the first study that provides a profile of cancer in the Administrative Districts of North Jakarta and Kepulauan Seribu in 2008-2012. The results of this study are expected to be a consideration for administrative policy holders, especially in the field of health services for the development of cancer services in DKI Jakarta Province in general and in the Administrative Districts of North Jakarta and Kepulauan Seribu specifically.

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