

The First Statistical Analysis of BUZIM Cancer Types

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Abstract

Cancer is referred to as malignancy and presented uncontrolled proliferation of cell. Although some of the types are mostly observed, some of them could be in rare amount. Cancer can be affected by many factors including smoking, drinking, obesity, hormones, and environment. Biostatistics is a powerful tool for describing and summarizing different data. This work has been firstly done to analyse the cancer type and rate in Buzim, a city in Bosnia and Herzegovina. According to Buzim main hospital registered data analysis, cancer profiles of the city showed variety of cancer types. Descriptive statistics was used to describe the population and given insight into cancer increasing rate in municipality of the city. By the basic statistical analysis, we understood that digestive and respiratory organs cancer rate more than other and rapidly increased last decade.

Keywords: Cancer types and rates; Buzim; Descriptive statistics

Introduction

Cancer is referred to as malignancy, and presents as abnormal cell proliferation with spread to other tissues. It is not only a name for one particular disease but for a group related disease [1]. Cancer is not limited to a single location inside the body, but it can start anywhere in the body and the cells can differentiate from normal cells primarily by their unstoppable proliferation. Another characteristic is that their cells are less specialized than normal cell [2,3]. An important part in cancer treatment is to diagnose it early. In early stages, the cancer is treatable, and an optimal therapy can be chosen. The disease and its patient population is heterogeneous and show unique characteristics. Thus, it cannot be a single generalized treatment, but it must be specific for each patient [1]. Therefore, personalized medicine seems one of the strongest treatment for the any cancer types. Even though cancer is thought to be a problem of developed countries, the facts do not present like that 57% of all cancers, excluding non-melanoma skin cancer observed in less developed counties, and 43% in developed countries. The age-standardized cancer rate is also higher in developed countries. Cancer was diagnosed in 268 cases per 100.000 in more developed regions when compared to less developed countries where it was diagnosed in 148 cases. The rate of all cancers is 1.8 times higher in more developed regions when compared to less developed regions. Skin melanoma, kidney cancer, Hodgkin lymphoma and multiple myeloma, rates are three times higher in more developed countries than in less developed countries. Nasopharyngeal cancer has its rate three times higher in less developed than in more developed countries. In men, the rate for all cancers is 1.9 times higher in more developed than in less developed countries. Cancer rates are three times higher in more developed than in less developed regions with prostate, bladder, kidney, testis, multiple myeloma and skin melanoma. High cancer rates are evident in less developed regions with stomach, liver, oesophagus, nasopharynx and Kaposi's sarcoma. In women, the rate for all cancers are 1.8 times higher in more developed when compared with less developed regions. Cancer rates are observed in less developed countries with cervix, stomach, liver, oesophagus, lip and oral cavity, gallbladder, nasopharynx and leukemia [4,5]. In order to make genomic and structural genetics of different cancer types, the general and common statistics and observational result should be revealed and understood [6-11]. Real data always guide us and extract the valuable analysis from it.

Materials and Methods

The data used in this research was obtained from protocols of

hospital JU Dom Zdravlja Buzim, between 2001 and 2016. 244 cancer patients all clinical data were used in the work, gender, year of birth, date of diagnosis based on International Disease Classification. Only the data from 1995 until 2001 is missing. The data was divided by different parameters in order to be tested. Different divisions included division by living place and division by type of disease. Data was subjected to descriptive statistics analysis including mean, standard deviation, minimum and maximum age, skewness and kurtosis test.

Results

The total population of Buzim is 20, 298 and 244 cancer patients show 1.20% of it. The data set consisted of 118 female patients and 126 male patients. First thing that we can notice is the increase in number of cancer patients from year 2010 till 2016 as we can see in Figure 1. In 2001 there was 11 patients, 2002 there was 6, in 2003 18, 2004 8, 2005 4, 2006 3, 2007 15, 2008 15, 2009 5, 2010 26, 2011 19, 2012 21, 2013 12, 2014 25, 2015 28 and 2016 27 patients. The minimal number of patients is 1 from year 1997 and maximum number of patients is 28 from year

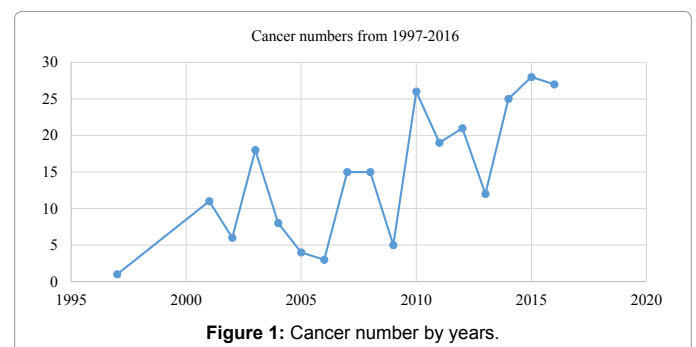


Figure 1: Cancer number by years.

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2015. The average number of patients yearly is 14.35. The median (the value that splits the given numbers to two equal sets) is 15. The mode of this yearly occurring patients is 15. The Kurtosis calculated from number of diseased patients yearly is -1.34 and their Skewness is 4.06. Average years calculated from all cancer having patients is 59 and their standard deviation is 15.8.

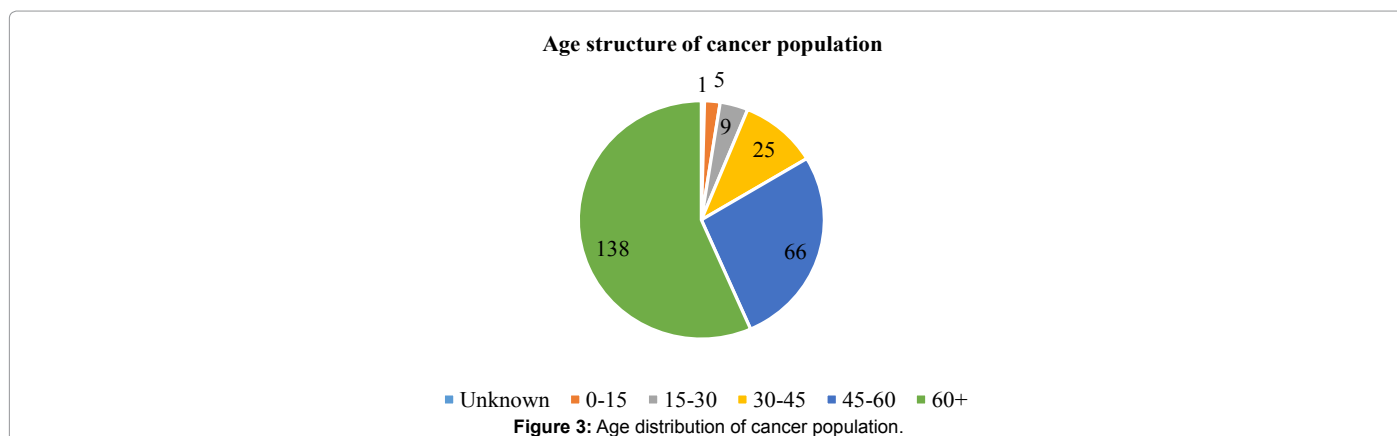
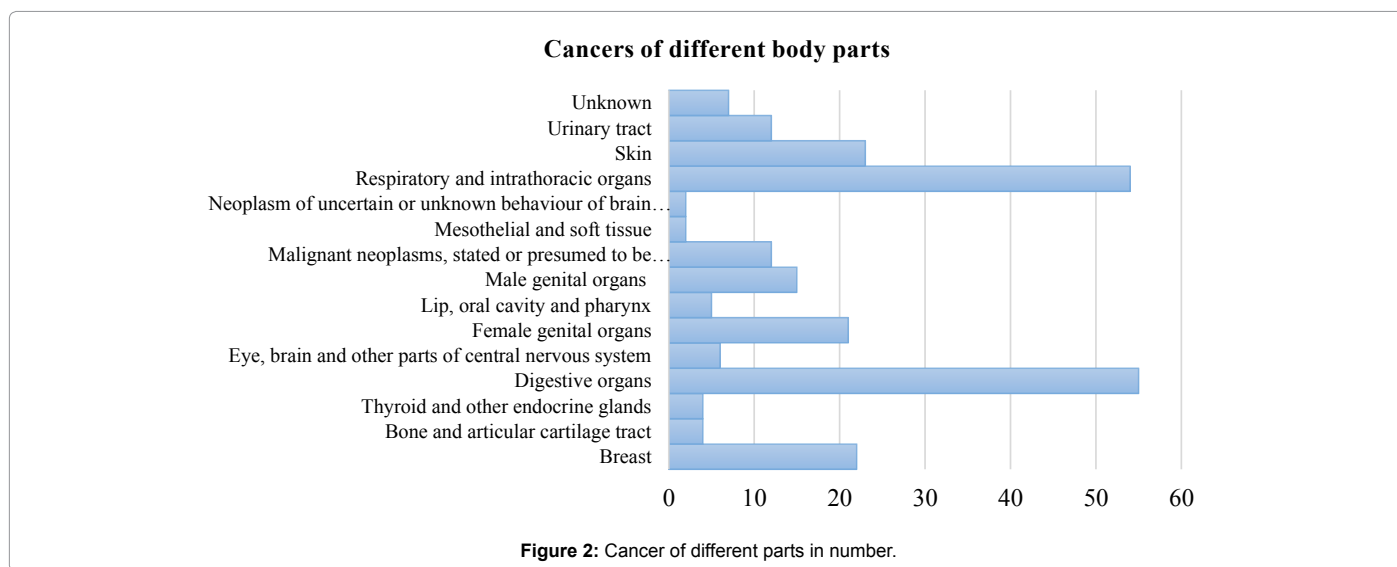
The most occurring cancer type is digestive organs that were seen in 55 cases. It was followed by the cancer of respiratory and intrathoracic organs that was seen in 54 cases. There was also 23 skin cancers, 22 breast cancers, 21 female genital organs cancer, 15 male genital organ cancer, 12 malignant neoplasms, stated of presumed to be primary, of lymphoid, hematopoietic and related tissue, 12 urinary tract cancer, 2 neoplasms of uncertain or unknown behaviour of brain and central nervous system, 2 cancers of mesothelial and soft tissue, 5 cancers of lip, oral cavity and pharynx, 6 cancers of eye, brain and other parts of central nervous system, 4 cancers of bone and articular cartilage tract, 4 cancers of thyroid and other endocrine glands and also 7 cancers of unknown location (Figure 2).

The distribution of patients age involving in this data is presented in this order. 5 patients are from 0 till 15 years old, 9 patients from 15 to 30 years old, 25 patients from 30 to 45 years old, 66 patients from 45 to 60 years old and 138 patients older than 60 years. We had one patient in the data set for which we did not know the date of birth (Figure 3).

The total numbers show the average age of 59 with minimum of 1, maximum of 88 and standard deviation of 15.8 (Table 1). The highest average age is for neoplasms of brain and central nervous system (CNS). The lowest average age is for mesothelial and soft tissue cancer. Significant gender preference is visible with respiratory and intrathoracic organs cancer.

Conclusion

Buzim is a relatively small municipality and it was hard to get the data from local medical institution. World cancer studies have shown that most risky age for cancer varies from 55 to 75, and the results from the city show age mean of 59 years with standard deviation of 16. Most patients are older than 60 years, and that makes 56% of total patients. Only 0.057% of patients are younger than 30 years old meaning that they are the least risk group and 60-year old and above are in the high-risk group. The mean is consistent with world statistics. Most patients were from MZ Buzim which is the most polluted and with highest number of residents, so the obtained result is consistent with presumptions. Peculiar is the fact that 1.2% of the entire population of the city has been diagnosed with cancer up to now. When tracking yearly distribution by normality testing, we can conclude that the data is not normally distributed, the distribution is rather skewed. That means that it departures from horizontal symmetry. Also, Kurtosis test indicates that distribution is platykurtic meaning that



Cancer Type	Number	Average Age	STD	Min Age	Max Age	Male	Female
Female genital organs	21	57	8.8	41	74	0	21
Urinary tract	12	57	24.1	3	77	7	5
Skin	23	67	12.5	33	85	8	15
Male genital organs	15	63	18.1	21	79	15	0
Digestive organs	55	60	14.7	4	83	27	28
Lymphoid, haematopoietic and related tissue		43	21.5	2	73	2	10
Respiratory and intrathoracic Organs	54	64	10.3	39	87	51	3
Breast	22	54	14.9	34	84	0	22
Lip, oral cavity and pharynx	5	65	17.8	46	88	3	2
Eye, brain and other parts of CNS	6	50	9.1	34	59	4	2
Thyroid and other endocrine Glands	4	43	5.9	36	50	2	2
Bone and articular cartilage	4	44	24.6	10	67	3	1
Neoplasm of brain and CNS (Unknown behaviour)	2	68	3.5	65	70	1	1
Mesothelial and soft tissue	2	32	43.8	1	63	0	2
Unknown	7	61	13.4	42	78	4	3
Total	244	59	15.8	1	88	127	117

Table 1: Overview of cancer characteristics.

the tails are shorter and thinner what would indicate many extreme outliers. Digestive organs cancer was the most occurrent one, along with respiratory and intrathoracic organs cancer. Digestive organ cancer affects equally both male and female while with respiratory and intrathoracic organs cancer patients are 95% male. Dramatic increase in cancer occurrence happened in 2010. Most patients were diagnosed with cancer in 2015. It is important to say that punctuality of the data is not 100% sure because they were taken out from hospital protocol. The primary goal of this research was to describe the cancer population of the city using statistics and to derive conclusions that could help in disease diagnosis or prognosis. Throughout the study, we saw how difficult it is to work with data in Bosnia and Herzegovina because people are not recognizing the importance of statistical data analysis and how it can influence research. If there was punctual data, it would be possible to determine risk factors and risk groups and therefore do some steps to prevent or decrease the number of cancer. Unfortunately, that is not possible because all of the data may or may not be correct. Future studies with this data would include water analysis and soil analysis of MZ Buzim and compare it to the population of another city.

Also, the mortality of different types of carcinomas will be shown.

References

- Nass SJ, Moses HL (2007) The promises and challenges of improving detection and treatment. Committee on Developing Biomarker-Based Tools for Cancer Screening, Diagnosis, and Treatment.
- Frank SA (2007) Dynamics of cancer: incidence, inheritance, and evolution. princeton university press.
- Kufe DW, Pollock RE, Weichselbaum RR, Bast RC, Gansler TS (2003) Holland-Frei cancer medicine.
- World Cancer Research Fund International (2017) Comparing more less developed countries.
- Dogan S (2017) New Possible Targetable Genes for Future Treatment of Mixed Lineage Leukemia. J Biom Biostat 8: 349.
- Dogan S, Cilic A, Marjanovic D, Kurtovic-Kozaric A (2017) Detection of cytosine and CpG density in proto-oncogenes and tumor suppressor genes in promoter sequences of acute myeloid leukemia.
- Dogan S, Kurtovic-Kozaric A, Karli G (2016). The Detection of Extremely High and Low Expressed Genes by EGEF Algorithm in Invasive Breast Cancer. J Biom Biostat 7: 286.
- Dogan S, Kurtovic-Kozaric A, Hajrovic A, Lisic M, Gokgoz E (2016) Comparison of MLL Fusion Genes Expression among the Cytogenetics abnormalities of Acute Myeloid Leukemia and Their Clinical Effects. J Biom Biostat 7:312.
- Dogan S, Cilic AX, Kurtovic-Kozaric A, Ozturk F (2015) Detection of G-type density in promoter sequence of colon cancer oncogenes and tumor suppressor genes. Bioinformation 11: 290-295.
- Dogan S, Kurtovic-Kozaric A (2015) Changes of Molecular, Cellular and Biological Activities According to microRNA-mRNA Interactions in Ovarian Cancer, Computational Molecular Biology 5: 1-8.
- Dogan S, Cilic, A, Marjanovic D, Kurtovic-Kozaric A (2017) Detection of cytosine and CpG density in proto-oncogenes and tumor suppressor genes in promoter sequences of acute myeloid leukemia.