

Cancer in Manipur

(A Statistical study)

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Abstract: The fundamental unit of a human body is a cell. Cells die if they are very old or highly damaged. So, they grow, divide and make new cells to replace them. However, if there is a change in the gene of a body, cells start growing uncontrollably and form a mass of tissue called tumor. There are cancerous tumor and benign tumor. Sometimes cancerous tumor spread to the other body parts, and we commonly have known this as a cancer. Now a day, cancer is a great challenge of human being. In Manipur, lung cancer is very high in both gender and nasopharyngeal cancer is also relatively high. In this paper it studied about the significant difference between age group and gender affected by the cancer and an attempt has been made to predict the number of cancer cases in Manipur. Secondary data are collected from PBCR, RIMS, IMPHAL and analysed with help of statistical tools using excel and found that Maximum number of cancer cases found in Imphal West and Imphal East districts and less number cancer cases found in Tamenglong district during the year 2012-2016. Among the age group there is difference of cancer cases in year 2012-2016. Age group 60-69 has maximum number of individual affected by cancer. Females are more affected by cancer than male. Finally, the prediction of cancer cases follows a linear pattern increasing year by year as $Y = 86.4X - 172370$.

Key words: Cancer, prediction of cancer cases.

Introduction

Human cells die if they are very old or highly damaged. So, they grow, divide and make new cells to replace them. However, if there is a change in the gene of a body, cells start growing uncontrollably and form a mass of tissue called tumor. There are cancerous tumor and benign tumor. Sometimes cancerous tumor spread to the other body parts, and we commonly have known this as a cancer. Skin cancer, stomach cancer, breast cancer, lung cancer, ovarian cancer, liver cancer, pancreatic cancer, bladder cancer, esophageal cancer, leukemia, colorectal cancer, uterine cancer, etc. are some of the cancer types. According to the data of the Indian census, 1991, there are 6,09,000 cases of cancer. But by the end of the last century, 8,06,000 cases have been observed. Out of 1,00,000 cases analyzed, cancer had increased with standardized rates of 96.4% for male and 88.2% for female (Rao et al, 1998). About 70% cancers have been treated with few survival cases during last decade (Dinshaw et al, 1999). The cancer problem in India is gradually increasing mainly because of the poor lifestyle and inadequate medical facilities (Wynder et al, 1974). Those cases observed in India are mostly breast, lungs, stomach, liver, colon, rectum cancers (Rao et al, 1998; Nandakumar, 1990-96; Murthy et al, 2004). Specially compared to the mainland of India North-East region can be considered as the centre of cancer in terms of its incidence and mortality. The main factor may be because people in these regions follow a different lifestyle and food habit from other parts of India. North-East people are distinct and genetically different from the rest Indian people but they are observed to be more closely related with the East Asian people (Cordaux et al, 2003). They can be distinguished with their Tibeto-Burman languages and North eastern tribes are believed to be migrated from the Eastern and the South Eastern Asia parts (Kataki et al, 2011). North-East people consume mostly smoked fish and meat, dry fish and meat, banana products, bamboo shoots, exotic wild herbs, etc. During the ethnic or traditional occasions, fermented rice or millet beer, tobacco, local cigarette, Tamul (raw betel-nut), Paan (betel leaf) are used heavily. Some of the most leading cancers are oesophagus, Stomach, Lung, Hypopharynx, Nasopharynx, Larynx, Tongue, Gallbladder, and Thyroid. Esophagus cancer was the highest incidence both in male and female of NE region. 71.4% cases of this cancer were observed in male of East Khasi Hills, 46.2% in Meghalaya, 42% in Aizwal, 27% in Kamrup urban district, Assam, and 26% in Mizoram. For female 30.2% were observed in East Khasi Hills, 19.8% in Meghalaya, 18.3% in Kamrup urban district, Assam. The incidence of esophageal cancer is globally ranked sixth (males) and ninth (females) (Kumar et al, 2006). In East Khasi Hills, out of 944 male, 323 and 140 out of 563 female were of oesophagus cancer cases (NCRP, 2013). Stomach cancer is placed at the second highest reason behind all the deaths in NE region and fourth in the world. In 2008, new cases of about 9,89,600 and deaths due to the stomach cancer estimated at about 7,38,000 was observed which is about 8% of the global total cancer cases and 10% of total deaths with cancer (Jemal et al, 2011). Mizoram state is the region with the highest risk of stomach cancer in the entire India (Rao et al, 1998; Phukan et al., 2011). 64 males and 31 females per 1,00,000 were diagnosed with stomach cancer in Aizwal district of Mizoram state. In the entire Mizoram there were 47.6% of male and 22.7% of female cases. Out of 10 regions with the highest incidence of stomach cancer in India, 8 were from the NE region. Mizoram was next to the Japan in the top incidence of stomach cancer in the world. High consumption of smoked fish and meat, Meiziol (local cigarette) and Tuibur (water filtrated smokeless tobacco) may be the reason for this matter. Studies have suggested that the habit of smoking along with Meiziol and Tuibur in Mizoram is found to be increasing the risk of lung cancer with $OR=23.02$ (Malakar et al., 2013). Nasopharynx is another cancer which is again very high in the NE- State as compared to the mainland of India and is also leading globally after China. Nasopharyngeal carcinoma is believed to be a rare cancer in the world except for the regions in South Eastern Asia, Southern China (Sharma et al., 2012). 10 out of the 10 leading regions with nasopharynx cancer in India were from the North-East states. It is assumed that Northeastern people are migrated from the East and the South East Asia and they brought the risk of nasopharyngeal carcinoma (Kataki et al., 2011).

Manipur has a very high occurrence of lung cancer. This is because of the habits prevailing from the past like using heavy tobacco in smoking or hookah, etc. and burning of firewoods. The habit of consuming smoked meat and fish, salted

fish, paan eating are prevalent habits in Manipur. All these factors lead to the incidence of nasopharyngeal cancer, oropharyngeal cancers and lung cancer. Carcinogenesis takes around 20-25 years from the start of the exposure to notice. So, it is predicted that in the coming future (15-20 years) there will be more rate of having oropharyngeal cancer in Manipur mainly to women.

Methodology:

In Manipur, cancer data are collected by Population Based Cancer Registry (PBCR), RIMS, IMPHAL. Dataset of yr 2012-2016 are used from PBCR to test the null hypothesis H_0 : there is no significant difference between age group against the alternative null hypothesis H_1 : there is significant difference between the age group. And also an attempt has been made to predict total number of cancer cases in Manipur.

DISTRICT WISE DISTRIBUTION OF CANCERS, MANIPUR:

Table No. 1 frequency distribution of cancer cases of different district

Fig. No. 1

Year	Senapati	Tamenglong	Churachandpur	Bishnupur	Thoubal	Imphal West	Imphal East	Ukhrul	Chandel
2012	113	21	121	150	199	458	278	85	78
2013	122	45	126	155	196	505	272	71	47
2014	103	32	139	152	245	502	274	76	46
2015	129	30	191	164	256	569	318	57	53
2016	152	39	153	166	267	610	289	85	60

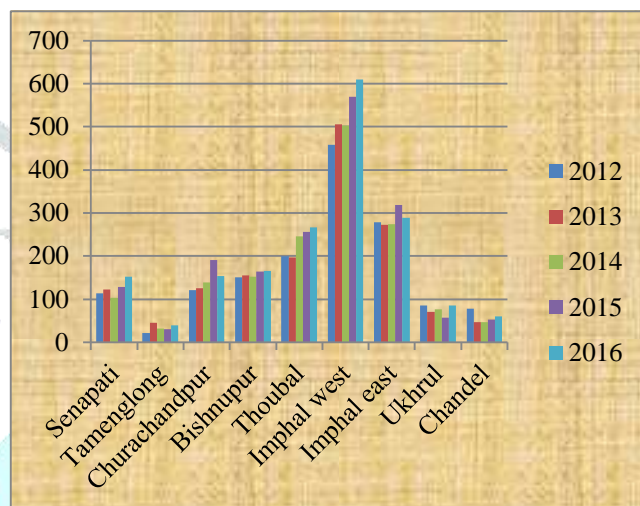
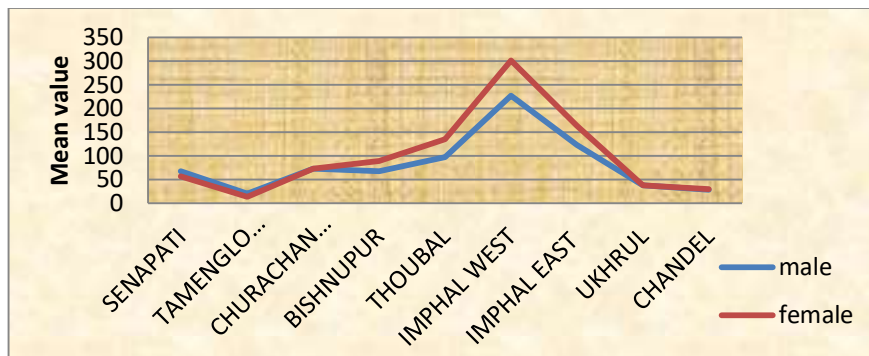


Table No. 1 shows the distribution of cancer cases of manipur. It shows that cancer cases of different years from 2012 to 2016 for different districts of Manipur. Different districts have same nature of increasing and decreasing pattern (Fig. No.1). It is shown that Imphal west has maximum number of cancer cases as compare to other districts and next is Imphat East and thoubal district. Minimum number of cancer cases was found in Tamenglong District.

Table No. 2 frequency distribution of cancer cases of different district with respect to gender.

year	SENAPATI		TAMENGLONG		CHURACHANDPUR		BISHNUPUR		THOUBAL		IMPHAL WEST		IMPHAL EAST		UKHRUL		CHANDEL	
	male	female	male	female	male	female	male	female	male	female	male	female	male	female	male	female	male	female
2012	58	55	8	13	61	60	60	90	80	119	206	252	118	160	36	49	42	36
2013	70	52	32	13	52	74	71	84	82	114	225	280	115	157	38	33	21	26
2014	46	57	20	12	71	68	68	84	104	141	207	295	125	149	37	39	18	28
2015	70	59	16	14	105	86	74	90	112	144	241	328	133	185	27	30	22	31
2016	90	62	22	17	74	79	66	100	109	158	257	353	120	169	49	36	34	26

Fig. No.2

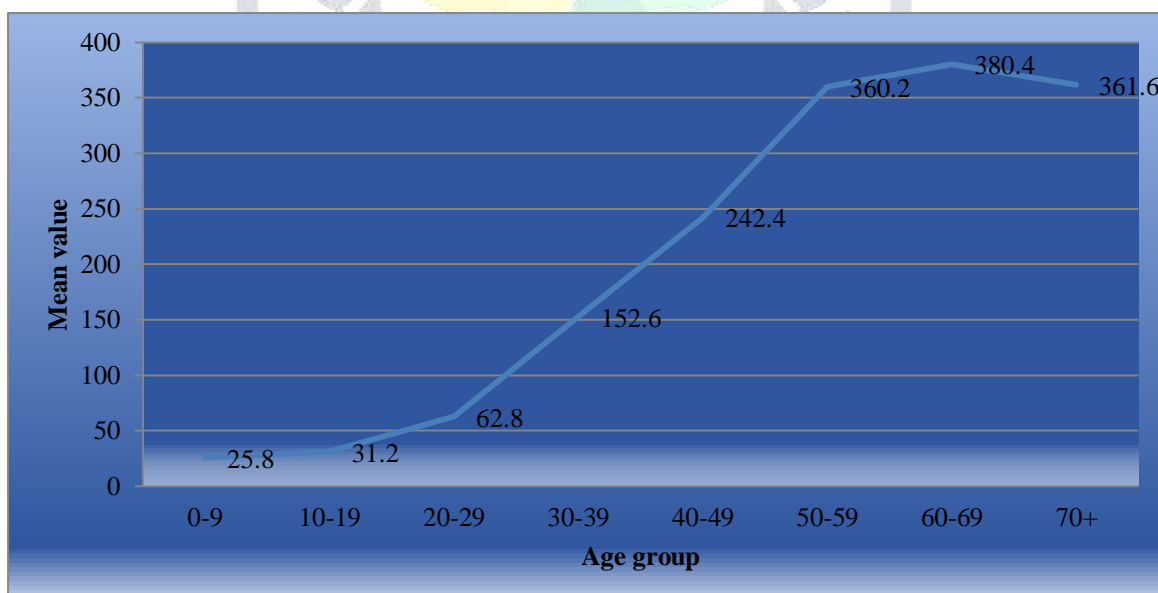


From the above Table No.2 and Fig.No.2, it is clear that Imphal west has maximum number of cancer cases of female as compare with the other districts and next is Imphal East. Churchandpur district, Bishnupur district and Thoubal district have cancer cases of female than male. Tamenglong district and Senapati district have cancer cases of male than female. Ukhrul district has same rate of cancer cases in both genders.

Table No.3 frequency distribution of cancer cases with respect to age

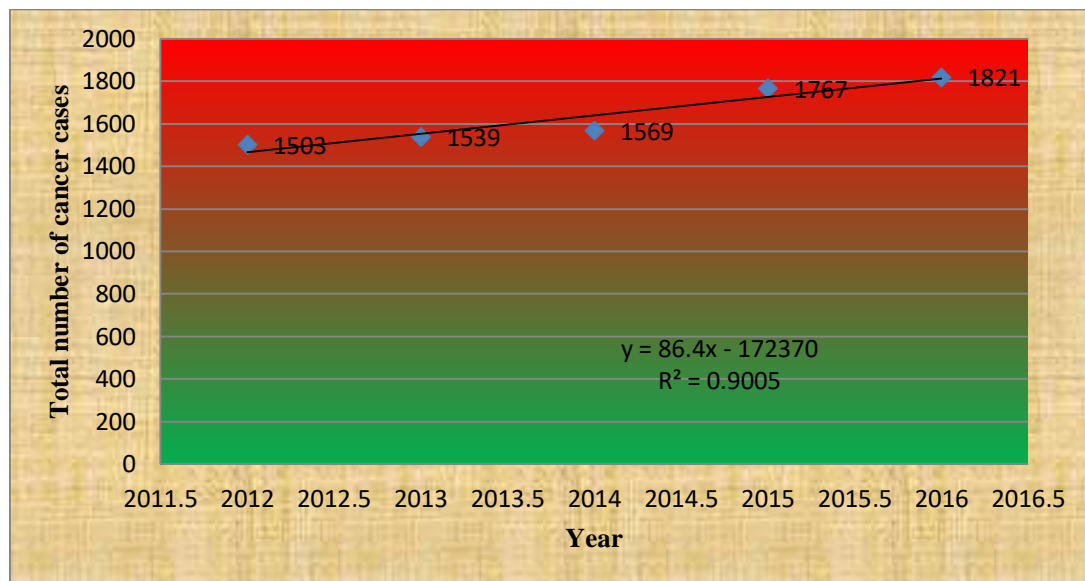
Year	Age group							
	0-9	19-Oct	20-29	30-39	40-49	50-59	60-69	70+
2012	24	32	75	137	223	327	343	342
2013	21	31	62	155	230	361	350	329
2014	30	38	66	144	248	349	359	335
2015	27	29	61	158	240	387	442	420
2016	27	25	50	169	271	377	408	382

Fig. No. 3



It is clear from analysis of variance (using table No.3) that P value is less than 0.05 at 5% level of significant therefore it may reject the null hypothesis “there is no significant difference between the age groups affected by cancer” and accept the alternative hypothesis “there is significant difference between the age group affected by the cancer”.

Fig. no. 4 Scatter diagram of cancer cases of Manipur.



The scatter plot shows the relationship between how many persons affected by cancer per year and their result. A line is fitted to the data to model the relationship as $Y = 86.4X - 172370$, where X is the explanatory variable (year) and Y is the dependent variable (no. of cancer cases).

Conclusion:

Maximum number of cancer cases found in Imphal West and Imphal East districts and less number cancer cases found in Tamenglong district during the year 2012-2016. Among the age group there is difference of cancer cases in year 2012-2016. Age group 60-69 has maximum number of individual affected by cancer. Females are more affected by cancer than male. Finally, the prediction of cancer cases follows a linear pattern increasing year by year. Therefore, to avoid the havoc in the future, now is the right time to study on this serious matter. And a global intervention is also much needed to make an advance measure control in Manipur.

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