

An investigation into Socio economic and demographic variation of Cancer incidences: A study among the Khasi Tribe in Meghalaya.

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Abstract

NCRP (2013) reveals that Age standardise rate per 100000 population of cancer incidences in males is 273.4 in Aizawl district of Mizoram state followed by 216.0 of East Khasi Hills district of Meghalaya. Cancer of the Oesophagus is the leading site in the registries of Assam and Meghalaya.

The present study will highlight cancer incidences by other background characteristics like by levels of education, occupational status and income levels and marital status, which is not provided in PBCRs reports.

A total of 50 numbers of respondents were identified from Myllem Block in East Khasi Hill District, Meghalaya, India. The information is collected through structured questionnaire. The data coded and enter in SPSS 16.0 software and analysis is carried out by the use of percentages, cross tabulation, chi square test and Multinomial logistic regression.

Throat cancer seems to be the highest incidences of cancer among the surveyed respondents. The study reveals that the incidences of cancer is high to respondents; age group 45 – 49, who are working as private employees, entrepreneurs and those in farm and agriculture, with no education, whose marital status is separated. When it comes to cost of treatment 24(48%) respondents mentions that they spent above Rs 100000/-(1667 US \$).

Keywords: Cancer, Socio- Economic, Chi Square, Multinomial, Khasi tribe.

Introduction

The **Global Cancer report 2014** reveals that in the year 2012, the worldwide burden of cancer rose to an estimated 14 million new cases per year, a figure expected to rise to 22 million annually within the next two decades. Over the same period, cancer deaths are predicted to rise from an estimated 8.2 million annually to 13 million per year. Globally, in 2012 the most common cancers diagnosed were those of the lung (1.8 million cases, 13.0% of the total), breast (1.7 million, 11.9%), and large bowel (1.4 million, 9.7%). The most common causes of cancer death were cancers of the lung (1.6 million, 19.4% of the total), liver (0.8 million, 9.1%), and stomach (0.7 million, 8.8%).

The global burden of cancer has more than doubled during the past 30 years. In 2008, it is estimated that there were over 12 million new cases of cancer diagnosed, 7 million deaths from cancer and 25 million persons alive with cancer. The continued growth and ageing of the world's population will greatly affect the cancer burden. By 2030, it could be expected that there could be 27 million incident cases of cancer, 17 million cancer deaths annually and 75 million persons alive with cancer within five years of diagnosis(**Peter Boyle and Bernard Levin, 2008**).

The world cancer report 2014 described that as a consequence of growing and ageing populations, developing countries are disproportionately affected by the increasing numbers of cancers. More than 60% of the world's total cases occur in Africa, Asia, and Central and South America, and these regions account for about 70% of the world's cancer deaths, a situation that is made worse by the lack of early detection and access to treatment.

In India, cancer is a major public health concern and has become one of the ten leading causes of death in the country. It is estimated that there are about 28 lakh cases of cancer at any particular point of time with 10 lakh new cases occurring every year. About 5 lakh deaths occur annually in the country due to cancer. As per *WHO Report 2005*, the estimated Cancer Deaths in India is projected to increase to 7 lakh by 2015. The burden of cancer is expected to further increase due to increase in life expectancy, demographic transitions and the effects of tobacco and other risk factors. 40 % of cancer cases are due to Tobacco use. The leading sites of cancer are the oral cavity, lungs, oesophagus and stomach among men and cervix, breast and oral cavity amongst women(**Planning commission, 2011**).

The leading site of cancers is varied in different parts of the country. Among males the leading site of cancer is Lung cancer in the PBCR of Delhi, Mumbai, Bhopal, Kolkata, Bangalore, Chennai, Thiruvananthapuram. Cancer of the Mouth is the leading site among males in PBCR of Ahmedabad. In North East, the leading site among males is Cancer of the Oesophagus in Assam, Stomach cancer in Mizoram and Sikkim, Lung cancer in Manipur. The leading site of cancer among females is Cancer of the Breast in PBCR of Delhi, Mumbai, Bhopal, Kolkata, Bangalore, Chennai, Thiruvananthapuram and Ahmedabad. In North East the leading site among females is Breast cancer in Assam, Cancer of the Lung in Mizoram and Manipur and Stomach cancer in Sikkim(**Planning commission, 2011**).

According to the **World cancer report, 2014**, the spiralling costs of the cancer burden are damaging the economies of even the richest countries and are way beyond the reach of developing countries, as well as placing impossible strains on health-care systems. In 2010, the total annual economic cost of cancer was estimated to reach approximately 1.16 trillion USD. Yet about half of all cancers could be avoided if current knowledge was adequately implemented. Access to effective and affordable cancer treatments in developing countries, including for childhood cancers, would significantly reduce mortality, even in settings where health-care services are less well developed. “The rise of cancer worldwide is a major obstacle to human development and well-being. These new figures and projections send a strong signal that immediate action is needed to confront this human disaster, which touches every community worldwide, without exception,” states Dr Christopher Wild, Director of IARC and co-editor of the report.

Objectives

The objectives of the study are

1. To find the disparities in demographic variation of cancer incidences in the State.
2. To find the disparities in Socio Economic variation of cancer incidences in the State.
3. To find the cost factor related to cancer treatment.

Review of literature

The **NCRP (2013)** reveals that at the national level, cancer of the lung, mouth, oesophagus and stomach are the leading sites across all registries. Among females, cancer

of the breast and cervix are the leading sites of cancer in 18 out of 25 PBCRs. Age adjusted rate(AAR) per 100000 population in males is 273.4 in Aizawl district of Mizoram state followed by 216.0 of East Khasi Hills district of Meghalaya.

Cancer of the Oesophagus is the leading site in the registries of Assam and Meghalaya. In connection with the use of tobacco, East Khasi Hills district of Meghalaya has the highest relative proportion with 69.3% and 43.0% for males and females respectively. East khasi Hills and Meghalaya as a whole shows the highest AAR in cancer of the oesophagus(in both males and females) and cancer of the hypopharynx and larynx in males.

Among males, 14.8% males in the age group 0 to 64 years in East khasi Hills district are likely to develop cancer during their lifetime and this figure is just next to Aizawl district.

In Meghalaya state, the leading cancer sites for males were: Oesophagus(29.8%), Hypopharynx(11.5%), Stomach(7.4%), Lung(5.9%) and Mouth(5.2%). The respective CR and AAR per 100000 population for these sites were: Oesophagus(24.0, 46.2), Hypopharynx(9.3, 17.4), Stomach(6.0, 13.4), Lung(4.8, 10.9) and Mouth(4.2, 8.1). The leading cancer sites for females were: Oesophagus(21.9%), Breast(11.2%), Cervix Uteri(10.4%), Mouth(6.8%) and Stomach(6.5%). The respective Crude incidences rate(CR) and AAR per 100000 population for these sites were: Oesophagus(9.9, 19.8), Breast(5.1, 9.1), Cervix Uteri(4.7, 7.8), Mouth(3.1, 6.1) and Stomach(3.0, 5.2).

East Khasi Hill district of Meghalaya had the highest relative proportion of cancer associated with the use of tobacco for males and females at 69.3% and 43.0 respectively when compare to all sites of cancers.

Mortality to incidence ratio is 31.2% and 29.6% for males and females respectively compare to the highest MI ratio of 71.8% and 67.2% in Barshi Rural.

Khongji P, 2012 finds that the incidences of cancer for all sites can significantly increase in the state of Mizoram and Dibrugarh district of Assam state for both males and females through the year 2016. There can be a moderate rise of cancer incidences for males in the state of Manipur and Kamrup district of Assam. A decrease of cancer incidences for females can be witness in the state of Manipur, Kamrup district of Assam. Sikkim is the only state which can witness a declining trend in cancer incidences through the year 2016.

According to the report by **Dikshit, et.al, 2012** of the center of Global health research, Canada, it reveals that across states, a 30 year old man in the North East has the highest chance(11.2%) of dying from cancer before 70 years of age. The same report also reveals that this chance of dying is highest(6.0%) for North east women.

Ramnath et al, 2010 reveals that the total cancer cases in India are likely to go up from 979,786 cases in the year 2010 to 1,148,757 cases in the year 2020. The tobacco-related cancers for males are estimated to go up from 190,244 in the year 2010 to 225,241 in the year 2020. Similarly, the female cases will go up from 75,289 in year 2010 to 93,563 in the year 2020.

Daixin Y, et al.,(2010) found that significant variations were detected in socio economic status(SES) disparities within each of four major racial/ethnic groups (non-Hispanic white, black, Hispanic, and Asian/Pacific Islander) for all five major cancer sites. Female breast cancer and prostate cancer incidence increased with increased SES in all groups, with the trend strongest among Hispanics. Incidence of cervical cancer increased with decreased SES, with the largest gradient among non-Hispanic white women. Lung cancer incidence increased with decreased SES with the exception of Hispanic men and women, for whom SES gradient was in the opposite direction. For colorectal cancer, higher incidence was associated with lower SES in non-Hispanic whites but with higher SES in Hispanics and Asian/Pacific Islander women.

Need of Study

In recent years, a mounting body of evidence suggests that increasing wealth, economic opportunities and education have led to better health, an increasing life expectancy and a growing and ageing population. Such global transitions are also associated with less favourable consequences including the increasing prospects of, and accessibility to, unhealthy lifestyle behaviours, including tobacco use, increased consumption of highly calorific foods, and a reduction in physical activity. The cumulative impact of these lifestyle choices on the world's larger and increasingly aged population has led to an increase in the burden of non-communicable diseases in many low- and middle-income countries undergoing human transition including India (**Rajendra et al, 2014**)

In recent years cancer cases and death have risen alarmingly in the state of Meghalaya and data shows that the cancer incidences in the state have risen as 518 cases in 2005, 759 cases in 2006, 865 cases in 2008, 888 in 2009, 1007 in 2010 and 348 cases till Mar 2011 (**Khongji, 2012**).

With the alarming rise of cancer cases in the state and as suggested by NCRP Bangalore, the registry has written suggestion to the government of Meghalaya to make cancer as a notifiable disease in the state. The above mention PBCR undoubtedly provide a wealth of information on cancer incidences and mortality by site, sex, age group at state and certain district levels. However certain vital information are still missing when it comes to information of cancer incidences by other background characteristics like by levels of education, occupational status and income levels and marital status. The present study thus will bridge this gap through an independent pilot study in a small scale and try to addresses this lacunae and when found useful, can be replicated in a large scale to cover the entire state with an optimum sample size so that all vital information can be included.

Data and Methodology:

The primary objectives in the present work is to fill some lacunae in the report of PBCR collected, compiled and published by National centre for diseases informatics and research, National cancer registry program under the Indian council of Medical research.

With limited fund constraint of Rs 1 lakh (1667 US \$) which is self-funded by the researcher, a small pilot study can only be taken up with limited number of respondents. As this study is to basically to explore incidences of cancer by demographic and socio economic indicators, the target population are those cancer patients/close relatives of cancer victims.

Identification of respondents is done with Hospital records of cancer patients available with Civil Hospital, Shillong. The address information from these records is considered as a sampling frame. However funds constraints restricts the research team to utilised probability sampling for the purposed of data collection.

The team then samples the respondents by telephonic appointment and whoever is willing to provide the detail information about the subjects were eventually visited by the data collector and information is gathered from the respondents through a semi open ended structured questionnaire.

Ethical procedure is followed at each step of the research process right from the permission to access the data of the respondents from Civil Hospital, Shillong, the request for the appointment with the respondents, the consent of the respondents/key informants for the collection of information and maintenance of confidentiality of personal information of the respondents during data analysis and publishing of research findings.

A total of 50 numbers of respondents were identified from only block viz Myllem Block in East Khasi Hill District, Meghalaya state, India. The information collected through the structured questionnaire includes age, gender, occupation, religion, educational status, Household income, marital status and some open ended questions about the symptoms, type of diagnosis, kind of treatment, duration of treatment and cost of treatment. A single question was asked about the diet content and another question about the consumption of betlenut/smoking/taking tobacco and consumption of alcohol. The survey is carried out in the month of March to June, 2014.

The data coded and enter in SPSS 16.0 software and analysis is carried out by the use of percentages, cross tabulation, chi square test and Multinomial logistic regression.

Results and Discussion

Interpretation of the result on Percentages.

Table 2 reveals that 13 number of respondents acquired throat cancer, 6 acquired cervical cancer, 6 lung cancer, 5 stomach cancer, 4 oesophagus and few other acquired other sites of cancer. In connection to the duration of treatment, a high proportion of the respondents mentioned to 9 – 12 months as depicted in Table 2. When it comes to cost of treatment 13(26%) mentions that they spent between Rs 50000(833 US \$) to Rs 100000(1667 US \$) and 24(48%) mentions that they spent above Rs 100000(1667 US \$) as depicted in Table 2

A single question was asked about the diet content and another question about the consumption of betlenut/smoking/taking tobacco and consumption of alcohol. Table 2 reveals that 8(16%) numbers of respondents consumed betlenut, 18(36%) respondents consumed betlenut and tobacco and only (6%) have betlenut, tobacco and alcohol.

In spite of the high cost involve in the treatment of cancer, 45(90%) did not have access to Medical insurance like MHIS, Medi-claim and others.

Interpretation of the result on Cross tabulation.

Cross tabulation run between type of cancer and gender shows that the association of these two characteristics is statistically significant with the Pearson Chi-Square of 0.001 level of significant. Out of 21 males 12 of them acquired throat cancer and out of 29 females 6 of them acquired cervical cancer, 4 oesophagus cancer, 3 breast cancer, 3 skin cancer, 3 lung cancer.

Cross tabulation run between type of cancer and occupation shows that the association of these two characteristics is statistically significant with the Pearson Chi-Square of 0.002 level of significant. By occupation, 14 numbers of housewives acquire cancer, 7 govt employees, 7 entrepreneurs and 15 from other occupation acquire cancer.

Cross tabulation run between type of cancer and Marital status shows that the association of these two characteristics is statistically significant with the Pearson Chi-Square of 0.001 level of significant. The table reveals that 24 married respondents and 17 widow / widower respondents acquired cancer.

Type of cancer and educational status/background is not statistically significant and data reveals that cancer incidences cut across educational background.

Type of cancer and Household income is not statistically significant and data reveals that cancer incidences cut across income status of the respondent.

Interpretation of the result on Multinomial Logistic Regression (MLR).

As a dependent variable/indicator is "Type of cancer" whose responses ranging from Lung, Mouth, cervical, Brest etc., the magnitude of association with the independent variables can be appropriately measured by Multinomial Logistic Regression. The corresponding independent variables taken in the regression are given in Table 1

Throat Cancer

The highest type of cancer incidences among the respondents is cancer of the throat which accounts for 13 cases among the total of 50. Across age groups, this type of cancer seems to be most prevalent in the age group 45 – 49 with the odds ratio of 166.8. When the respondents are categorized into various occupational groups, then Private employees has the highest odds of incidences of throat cancer followed by respondents who are entrepreneurs and then by those who are working in agricultural sectors. As the result from multinomial regression shows that respondents who are graduates has the highest chance

throat cancer followed by those with No education. Those respondents whose family income is more than Rs 50000/- is considered as redundant as there are only two samples and hence cannot be interpreted in the analysis. Thus according to economic status, those respondents whose household income is greater than Rs 50000/- have higher odds of probability to throat cancer. Another important finding that is revealed in the model is that with respect to marital status, that respondent who is separated has the highest chance to acquire the present type of cancer.

Lung Cancer

A total of 6 respondents acquired Lung cancer out of which 3 are males and 3 are females. The MLR model mentioned above reveals that occupation is a detrimental factor in the incidences of Lung cancer, as the chances of the disease are high for those respondents working as entrepreneurs with odds of 5.8. The Chances (odds) of Housewives getting the disease is same as those working as Government employees. Across educational status, respondents with No education have the highest chance of having Lung cancer. With respect to Marital status, those respondents who are separated have the highest chance (odds of 3.6) to obtain the present type of cancer followed equally likely by those who are married and widowed/widower with odds of 0.751 and 0.795 respectively.

Cervical cancer

A total of 6 female respondents reported to have cervical cancer. The result from the MLR model reveals that women respondents in the age group 45-49 have the highest chance of getting cervical cancer. Also those with age group 55-59, 60-64 and 75-79 have very high probability of getting the disease. Thus this disease is likely to occur to women respondents age group 45+. By occupational status, women respondents who are private employees have the highest chances of getting this type of cancer with an odds of 605 followed by those who are working in agricultural sector with an odds of 108. By educational status, women respondents who are graduates have a very high chance of getting this cancer with an odds of 10.2 followed by those who have No education with an odds of 8.5. By marital status, women who are separated have the highest chance (with an odds of 212.6) of having cervical cancer.

Stomach cancer

The model in the analysis shows that women respondents are more likely to have stomach cancer. By age groups respondents in the age group 45-49 have the highest chance of

having this type of cancer with odds of 209.7 followed by those in the age group 60-64 with odds of 100.7. There is also likelihood for respondent age group 40-44 in getting this disease with odds of 57.1. By type of occupation, respondent working as private employees have high chances of getting this cancer followed by those who are entrepreneurs. Govt employees have the least chance of getting the type of cancer. No information is reveal about the degrees of incidences by educational status and economic status in the present model. By marital status, respondent who are separated have the highest chance of having stomach cancer with and odds of 8000.9

Oesophagus cancer

Only 4 female respondents reported to having Oesophagus cancer. This is substantiated by the logistic regression model in the present analysis. By age group, respondents in the age group of 45-49 have the highest chance(with an odds of 7.1) of getting this type of cancer followed by those in the age group of 70-74 with an odds of 6.1 and also by respondents in the age group of 55-59 with an odds of 5.3. By type of occupation, respondents who are working as private employees have the high chance(with an odds of 12.7) to get oesophagus cancer and by educational level respondent with an educational level of 8-10 have a relatively high chance(with an odds of 9.9) to have the disease. Finally by marital status, respondents who are married have a relatively high chance (with an odds of 1.02) of getting this type of cancer.

Breast cancer

Only 3 female respondents reported to having Breast cancer. This is substantiated by the MLR model in the present analysis. Breast cancer seems predominant to those women respondent in the age group 30-39, followed by those in the age group 75-79 and those in the 45-49 age group. By kind of occupation, this type of cancer seems to occur most likely to respondents who are agriculturist (with an odds of 50.5) followed by those who are entrepreneurs (with an odds of 47.2) and housewives (with an odds of 27.4). Finally by marital status, respondents who are married have a relatively high chance (with an odds of 0.157) of getting this type of cancer.

Skin cancer

Only 3 females respondents reported to having Skin cancer . This is substantiated by the MLR model in the present analysis. By age group, respondents in the age group of 70-74 have the highest chance (with an odds of 993.1) of getting this type of cancer

followed by those in the age group of 45-49 with an odds of 454.8. By type of occupation, respondent working in agriculture sector have relatively high chances of getting this cancer followed by those who are working as private employees. By marital status, respondents who are married have a relatively high chance (with an odds of 0.215) of getting this type of cancer.

Kidney cancer

1 male and 1 female respondents reported to have Kidney cancer. By age group, respondents in the age group of 45-49 have the highest chance (with an odds of 498.3) of getting this type of cancer followed by those in the age group of 40-44 with an odds of 347.8 and also by respondents in the age group of 60-64 with an odds of 160.4. By type of occupation, respondent working in agriculture sector have relatively high chances (with an odds of 11.4) of getting this cancer followed by those who are working as private employees (with an odds of 6.5). By educational status, women respondents who are not educated have a relatively high chance (with an odds of 13.7) of getting this cancer followed by those who are graduates (with an odds of 3.07). By family income, those respondents whose income is Rs 10,000/- plus have high chances of having cancer. No conclusive evidence is revealed by the model on the incidences of this type of cancer by marital status.

Summary

- Out of the 50 respondents surveyed in the present study, 13 number of respondents acquired throat cancer, 6 acquired cervical cancer, 6 lung cancer, 5 stomach cancer, 4 oesophagus and few other acquired other sites of cancer.
- In connection to the duration of treatment, a high proportion of the respondents mentioned to 9 – 12 months.
- When it comes to cost of treatment 13(26%) mentions that they spent between Rs 50000(833 US \$) to Rs 100000(1667 US \$) and 24(48%) mentions that they spent above Rs 100000(1667 US \$) as depicted in Table 2
- 8(16%) numbers of respondents consumed betlenut, 18(36%) respondents consumed betlenut and tobacco and only (6%) have betlenut, tobacco and alcohol.
- 45(90%) did not have access to Medical insurance like MHIS, Mediclaim and others.
- The most statistically significant association through the Cross tabulation run between type of cancer with Gender, Occupation and Marital status.

- The highest type of cancer incidences among the respondents is **cancer of the throat** which accounts for 13 cases among the total of 50. The significant detrimental factors for this type of cancer are those respondents: of age group 45 – 49; private employees, entrepreneurs and those working in agriculture; graduates has the highest chance throat cancer followed by those with No education; respondents whose household income is greater than Rs 50000/- have a higher odds of probability to throat cancer; respondent who are separated has the highest chance to obtained the present type of cancer.
- Incidences of **Lung cancer** are high for those respondents working as entrepreneurs; respondents with No education have the highest chance of having Lung cancer; with respect to Marital status, those respondent who are separated has the highest chance to this type of cancer.
- The significant detrimental factors for **Cervical cancer** are those women respondents: in the age group 45-49+; private employees and those working in agricultural sector; who are graduates followed by those who have No education; who are separated.
- The significant detrimental factors for **Stomach cancer** are respondents: who are women; respondents in the age group 45-49 have highest chance of having this type of cancer followed by those in the age group 60-64 and those age group 40-44; respondent working as private employees followed by those who are entrepreneurs; respondent who are separated
- The significant detrimental factors for **Oesophagus cancer** are respondents: who are women; respondents in the age group of 45-49 followed by those in the age group of 70-74 and also those in the age group of 55-59; respondents who are working as private employees; respondent with an educational level of 8-10 standard; respondents who are married.
- The significant detrimental factors for **Breast cancer** are respondents: who are females; those women respondent in the age group 30-39, followed by those in the age group 75-79 and those in the 45-49 age group; respondents who are agriculturist followed by those who are entrepreneurs and housewives; respondents who are married.
- The significant detrimental factors for **Skin cancer** are respondents: who are women; respondents in the age group of 70-74 followed by those in the age group of 45-49; respondent working in agriculture sector have relatively high chances of

getting this cancer followed by those who are working as private employees; respondents who are married have a relatively high chance of getting this type of cancer.

- The significant detrimental factors for **kidney cancer** are respondents: in the age group of 45-49 have the highest chance followed by those in the age group of 40-44 and also by respondents in the age group of 60-64; working in agriculture sector followed by those who are working as private employees; who are not educated have a relatively high chance followed by those who are graduates; whose income is Rs 10,000/- plus have high chances of having cancer. No conclusive evidence is reveal by the model on the incidences of this type of cancer by marital status.

Conclusion

Throat cancer seems to be the highest incidences of cancer among the surveyed respondents. There can be various factors leading to this type of cancer and probability one of the causing factor in the present study is the eating of betlenut, tobacco and consumption alcohol.

As reveals in the above study, the age group 45 – 49 seems to be the period in which the incidences rate of cancer is highest from almost all of the cancer sites discussed above. Respondents who are working as private employees, entrepreneurs and those in farm and agriculture are more likely to get cancer incidences compare to Govt employees. Respondents with no education are more likely to cancer incidences. Another point worth noting is that cancer incidences is more likely to respondents whose marital status is separated.

Thus in conclusion, all the points mentions in this section needs further probe and research in order to arrive at a more conclusive evidence about the intermediate and proximate determinants of cancer incidences occur in this part of the country.

Suggestion

As the present is being conducted with only 50 respondents due to financial constraint, the findings in this research cannot be generalised but will served only as a pilot study by which a large scaled can be replicated so as to include many more respondents as a consequences of which suggestion can be made to Adequate legislation to reduce exposure and risk behaviours by effective campaigns and health promotion and also early detection, diagnosis, and treatment.

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Table 1 : Respondents by selected background characteristics.

Background characteristics	Number of Respondents
Age	
0 - 29	0
30 - 34	2
35 - 39	5
40 - 44	4
45 - 49	10
50 - 54	5
55 - 59	7
60 - 64	5
65 - 69	3
70 - 74	7
75 - 79	2
80+	0
Gender	
Male	21
Female	29
Religion	
Christian	44
Traditional	2
Others	4
Marital Status	
Married	24
Separated	1
Widow/Widower	17
Unmarried	2
Educational Level	
No Education	15
Below 8	9
8 to 10	2
10+2	18
Graduate	4
Others	2
Occupation	
Govt Employee	7
Private Sector	4
Enterprenures	7
Agriculture	2
Unemployed	1
Housewives	14
Others	15
Household Income(In Rs per month)	
<5000	3
5000 - 10000	16
10000 - 50000	17
>50000	1

Table 2 : Respondents by selected characteristics.

characteristics	Number of Respondents
Type of cancer	
Mouth	2
Liver	2
Skin	3
Kidney	2
Bone	1
Others	3
Throat	13
Oesophagus	4
Stomach	5
Cervical	6
Breast	3
Lung	6
Total	50
Duration of treatment	
1 week	4
2-3 months	8
3-5 months	3
6-8 months	5
9-12 months	18
13-18 months	3
18-24 months	3
25-36 months	4
37+ months	2
Total	50
Cost of treatment	
below 5000	1
5000-10000	3
10000-50000	8
50000-100000	13
100000 and above	24
Missing	1
Total	50
Eating / Consumption of	
Betlenut	8
Smoke	3
Betlenut and smoke	7
betlenut and Tobacco	18
Betlenut Smoke and tobacco	7
Betlenut alcohol and tobacco	3
Missing	4
Total	50
Health Insurance covered	
MHIS	2
Medi Claim	1
Others	2
None	45
Total	50

Table 3. Type of Cancer by Gender and Marital status.

Type of Cancer	Gender		Total	Marital Status				Total
	Male	Female		Married	Seperated	Widow/ Widower	Un Marrried	
Mouth	0	2	2	1	1	0	0	2
Liver	0	2	2	0	0	0	0	0
Skin	0	3	3	2	0	0	0	2
Kidney	1	1	2	0	0	1	1	2
Bone	0	1	1	0	0	0	1	1
Others	3	0	3	3	0	0	0	3
Throat	12	1	13	6	0	7	0	13
Oesophagus	0	4	4	3	0	1	0	4
Stomach	2	3	5	2	0	1	0	3
Cervical	0	6	6	2	0	3	0	5
Breast	0	3	3	1	0	2	0	3
Lung	3	3	6	4	0	2	0	6
Total	21	29	50	24	1	17	2	44
Pearson Chi-square test	Value	df	Sig*		Value	df	Sig*	
	33.074	11	.001		62.091	30	.001	

*Asymtotic Level of statistical significance (2-sided), df - degrees of freedom

Table 4. Type of Cancer by Occupation.

Type of Cancer	Occupation							Total
	Govt Employee	Private Sector	Entrepreneur	Agriculture	Unemployed	Housewives	Others(specify)	
Mouth	0	0	1	0	0	0	1	2
Liver	0	0	1	0	0	1	0	2
Skin	0	0	0	1	0	1	1	3
Kidney	0	0	0	0	0	1	1	2
Bone	0	0	0	0	1	0	0	1
Others	2	0	0	0	0	0	1	3
Throat	2	2	1	0	0	1	7	13
Oesophagus	0	0	0	0	0	3	1	4
Stomach	0	1	2	1	0	1	0	5
Cervical	2	0	0	0	0	3	1	6
Breast	1	1	0	0	0	1	0	3
Lung	0	0	2	0	0	2	2	6
Total	7	4	7	2	1	14	15	50
Chi-Square Tests	Value	df	Sig*					
Pearson Chi-square test	1.053E2	66	.002					

*Asymtotic Level of statistical significance (2-sided), df - degrees of freedom

Table 5. Result of the Multinomial logistic regression of type of cancer with corresponding background Characteristics.

Background Characteristics		Type of cancer															
		Skin		Kidney		Throat		Oesophagus		Stomach		Cervical		Breast		Lung	
		Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR
Gender	Male	0.56	0.144	-	-	-	-	0.22	0.008	0.53	0.155	0.23	0.004	0.23	0.013	-	-
	Female®	-	1.0	-	-	-	-	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0
Age Group	30 – 39	0.45	0.001	0.36	0.068	0.23	0.005	0.55	0.0	0.14	0.007	0.36	0.002	0.26	587	0.25	0.009
	40 – 44	0.12	4.97	0.48	347.8	0.54	2.57	0.26	1.31	0.25	57.15	0.41	29.9	0.45	88.6	0.14	0.027
	45 – 49	0.36	454.8	0.47	478.3	0.62	166.8	0.34	7.14	0.23	209.7	0.52	102.5	0.35	126	0.23	0.181
	50 – 54	0.58	0.039	0.66	36.11	0.84	0.023	0.45	0.08	0.86	0.005	0.26	4.62	0.45	1.28	0.56	0.003
	55 – 59	0.96	10.39	0.78	23.64	0.31	16.49	0.78	5.38	0.45	6.123	0.11	99.6	0.36	9.79	0.42	0.023
	60 – 64	0.74	7.25	0.52	160.5	0.52	9.07	0.66	1.62	0.63	100.7	0.46	85.2	0.56	43.2	0.33	0.089
	65 – 69	0.25	0.4	0.46	23.8	0.11	0.0602	0.53	2.59	0.54	0.004	0.79	42.3	0.45	0.314	0.41	0.13
	70 – 74	0.15	993.1	0.33	0.096	0.13	0.087	0.41	6.15	0.66	0.004	0.43	4.12	0.12	1.095	0.62	0.003
	75 – 79	0.26	28.9	0.45	79.4	0.26	23.53	0.30	2.10	0.74	6.63	0.55	80.1	0.14	189	0.21	0.339
	80+®	-	1.0	-	1.0	-	1.0	-	1.0	0.69	1.0	-	1.0	-	1.0	-	1.0
Education Level	No Education	0.58	0.096	0.36	13.7	0.55	2.5	0.24	0.018	0.45	0.025	0.23	8.59	0.47	0.006	0.45	0.106
	Below 8	0.46	0.009	0.45	0.96	0.23	0.539	0.36	0.026	0.19	0.0	0.45	0.072	0.56	0.032	0.52	0.008
	8 – 10	0.78	0.0	0.89	0.055	0.73	1.076	0.45	9.941	0.56	0.009	0.89	0.137	0.84	0.018	0.71	0.001
	10+2	0.85	0.21	0.75	3.07	0.14	14.52	0.62	0.135	0.45	0.007	0.21	10.25	0.41	0.097	0.63	0.01
	Graduate	0.96	0.004	0.11	0.108	0.36	0.001	0.89	0.009	0.73	0.006	0.25	0.009	0.32	0.036	0.56	0.047
	Post Graduate®	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0

Continue with Table 5. Result of the Multinomial logistic regression of type of cancer with corresponding background Characteristics.

Background Characteristics		Type of cancer															
		Skin		Kidney		Throat		Oesophagus		Stomach		Cervical		Breast		Lung	
		Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR	Sig	OR
Kind of Occupation	Govt Emp	0.14	0.0	0.56	0.006	0.56	0.0054	0.25	0.032	0.37	0.006	0.56	0.003	0.25	0.002	0.14	0.0
	Privt Emp	0.25	118.0	0.45	6.54	0.45	203	0.36	12.738	0.36	157.3	0.85	605.8	0.65	2.399	0.53	0.896
	Entrepreneurs	0.35	17.0	0.78	0.92	0.74	20.9	0.45	0.502	0.45	57.9	0.31	6.64	0.45	47.2	0.62	5.87
	Agriculturist	0.36	346.0	0.66	11.46	0.12	9.7	0.41	0.213	0.66	2.26	0.35	108.9	0.23	50.5	0.51	0.007
	Un employed	0.64	0.0008	0.14	0.007	0.32	0.714	0.85	0.047	0.49	0.618	0.16	0.002	0.46	0.042	0.84	0.002
	House Wives	0.75	74.6	0.12	1.03	0.91	0.844	0.20	0.034	0.45	20.24	0.45	0.398	0.25	27.4	0.77	0.857
	Others®	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0
Household Income (in Rs)	< 5000	0.16	0.0016	0.36	0.008	0.84	0.018	0.45	0.006	0.41	0.076	0.45	32	0.78	0.0	.25	0.006
	5000-10000	0.89	0.0039	0.14	0.003	0.31	0.023	0.23	0.0020	0.32	0.123	0.28	12	0.45	0.045	0.31	0.001
	10000-50000	0.42	0.0019	0.99	0.4	0.52	0.056	0.65	0.0	0.55	0.453	0.99	20	0.21	0.097	0.16	0.007
	50000+®	-	1.0	-	1.0	-	1.0	0.41	1.0	-	1.0	-	1.0	-	1.0	1.0	1.0
Marital Status	Married	0.83	0.215	0.51	0.001	0.87	13.47	0.23	1.027	0.42	0.377	0.45	31.06	0.45	0.07	0.25	0.751
	Seperated	0.45	0.002	0.21	0.008	0.861	922.5	0.14	0.011	0.23	89.4	0.26	212.6	0.63	0.157	0.26	3.632
	Widow/Widower	0.55	0.003	0.67	0.005	0.54	19.9	0.23	0.257	0.45	0.203	0.36	19.15	0.25	0.029	0.45	0.795
	Un married	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0	1.0	1.0

® Reference category, OR – odds ratios, Sig – Level of statistical significance