

# Statistical Analysis on Enduring of Post Graduate Institute of Medical Education & Research, Chandigarh Due to Infected Loam Causes

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**Abstract – Objective of study is to analyse the cause of cancer prone to loam impurities, pesticides and fertilizers by studying the data provided by the authorities and the Mathematical Modelling of significance of testing (Statistical Analysis). POST GRADUATE INSTITUTE OF MEDICAL EDUCATION & RESEARCH, CHANDIGARH, is a unit of Hometrail Buildtech Pvt. Ltd. It is the best Cancer and Cardiac hospital in Bathinda. An intuitive study of POST GRADUATE INSTITUTE OF MEDICAL EDUCATION & RESEARCH, CHANDIGARH of cancer endurings likely to be based on drinking loam impurities and fertilizers impact. The graph representation and significance of student's t-test for comparative study between Punjab and H.P., Haryana & Rajasthan are based on the data given by the authorities of the POST GRADUATE INSTITUTE OF MEDICAL EDUCATION & RESEARCH, CHANDIGARH. We shall come to know that number of cancer endurings admitted in the above mentioned hospital are more as compared to other states. As the hospital is situated in Punjab, the significant number of cancer endurings of Punjab are more in comparison to other state endurings. But the Mathematical modelling gives the relation between cancer endurings of those states with Punjab.**

**So the study about the POST GRADUATE INSTITUTE OF MEDICAL EDUCATION & RESEARCH, CHANDIGARH, is very significant to help the study of cancer enduring's nature prone to impure loam.**

## INTRODUCTION

The data is taken for cancer endurings recorded by Post Graduate Institute of Medical Education & Research, Chandigarh. The authentic reason of the cancer is never recorded but by the old scenario of Punjab, Haryana, Himachal Pradesh and Rajasthan, it seems to cause by the loam impurities and mixture of polluted loam and ground loam.

We are not able to recognise the causes of cancer till the date but perhaps it causes due to smoking, non-veg, drinking of liquor, impurities of loam (hardness of the loam), and soil mixture of fertilizers and many other reasons to cause the cancer. We are going to use only data of Post Graduate Institute of Medical Education & Research, Chandigarh established in Punjab and comparative study between Punjab and other (HP, Haryana and Rajasthan). As Post Graduate Institute of Medical Education & Research, Chandigarh is established in Punjab, so endurings of Punjab are higher than other states in it. But we like to

inform you the scenario of Punjab is very critical than other states regarding cancer endurings.

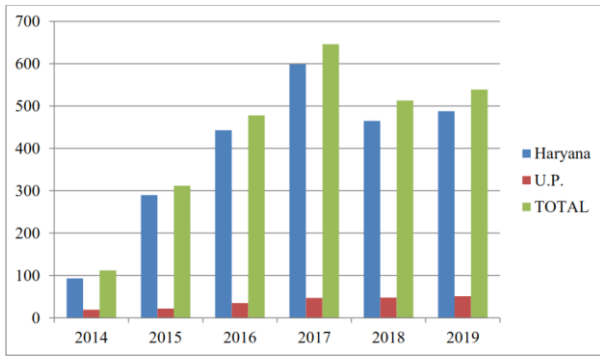
## DATA PROVIDING BY THE AUTHORITIES:

Below is the comparative statistical survey of cancer endurings of Punjab with HP, Haryana and Rajasthan in Post Graduate Institute of Medical Education & Research, Chandigarh.

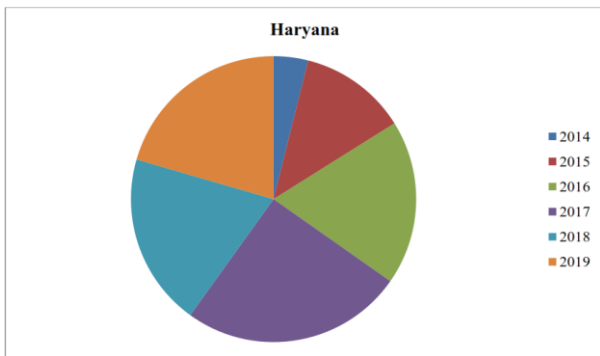
Table

EXPECTED NO. OF CASES PER YEAR			
YEAR	Haryana	U.P.	TOTAL
2014	93	19	112
2015	290	22	312
2016	443	35	478
2017	599	47	646
2018	465	48	513
2019	488	51	539
TOTAL	2378	222	2600

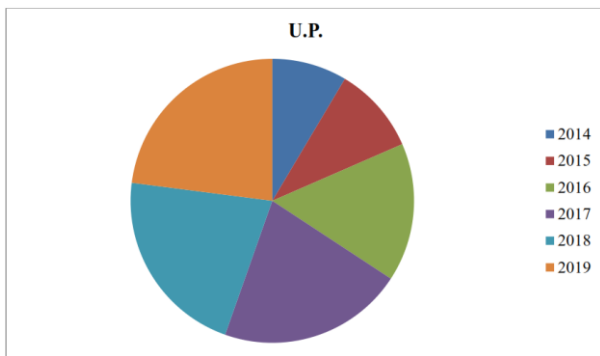
**Statistical Analysis:**



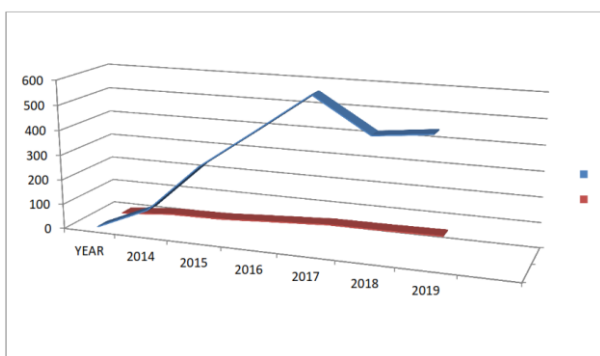
**Figure 1: Bar graph representation for the above data**



**Figure 2: pie chart representation of above data for Haryana**



**Figure 3: pie chart representation of above data for U.P**



**Figure 4: Ogive representation of the above data**

The significance test, student t-test is as follows:

**STUDENT’S T- DISTRIBUTION**

W.S. Gosset (1876-1937) in the early 1900 worked on t- distribution theoretically. Gosset was employed by the Guinness and Sons, a Dublin under their own names. So Gosset adopted the pen name “student” and published his findings under this name. So the t- distribution is commonly known as Student’s t- distribution or t-distribution.

The Student’s t- distribution is used when the sample size is 30 or less and the population standard deviation is unknown.

**PROPERTIES OF STUDENT’S T- DISTRIBUTION**

1. The variable t- distribution ranges from minus infinity to plus infinity.
2. The constant c is actually a function of v (pronounced as nu). So for a particular value of v, the distribution of f (t) is completely specified. Thus f(t) is a family of functions, for each value of v.
3. The variance of t- distribution is greater than 1, but approaches 1 as the number of degrees of freedom; therefore the sample size becomes large. Thus as the sample size increases, the variance of t- distribution approaches the variance of the standard normal distribution. For infinite value of v, the t- distribution and normal distribution are exactly equal. Hence there is a widely practised rule of sample size n > 30 may be considered as large and the standard normal distribution may appropriately be uses as an approximation to t- distribution. Where the latter is the theoretically correct functional form.

**THE T- TABLE**

The t- table is the probability integral of t- distribution. It gives, over a range of values of v, the probabilities of exceeding by chance values of t at different levels of significance. The t- distribution has a different value for each degree of freedom. When the degree of freedom is infinitely large, the t- distribution is equivalent to normal distribution and probabilities shown in the normal distribution tables are applicable.

**APPLICATION OF THE T- DISTRIBUTION**

Student’s t- distribution is generally used to test the significance of the various results obtained from small samples.

Testing difference between means of two samples: given two independent random samples of size  $n_1$  and  $n_2$  with means  $\bar{X}_1$  and  $\bar{X}_2$ , and standard deviations  $S_1$  and  $S_2$  we may be interested in testing the hypothesis that the samples come from the same normal population. To carry out the test, we calculate the statistics as follows:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S} \times \sqrt{\frac{n_1 n_2}{n_1 + n_2}}$$

Where

$\bar{X}_1$  = mean of the first sample

$\bar{X}_2$  = mean of the second sample

$n_1$  = number of observations in the first sample

$n_2$  = number of observations in the second sample

$S$  = combined standard deviation.

$$S_1 = \sqrt{\frac{(X_1 - \bar{X}_1)^2}{n_1 - 1}}$$

and

$$S_2 = \sqrt{\frac{(X_2 - \bar{X}_2)^2}{n_2 - 1}}$$

also

$$S = \sqrt{\frac{\{(n_1 - 1)S_1^2\} + \{(n_2 - 1)S_2^2\}}{n_1 + n_2 - 2}}$$

D.F. (Degree of Freedom) =  $n_1 + n_2 - 2$ ,

If the calculated value of  $t$  is  $> t_{0.05}$  ( $t_{0.01}$ ), the difference between the sample means is said to be significant at 5% (1%) level of significance otherwise the data are said to be consistent with the hypothesis.

Here in data of Post Graduate Institute of Medical Education & Research, Chandigarh,  $n_1 = n_2 = 6$ ,

After calculation, we get

$\bar{X}_1 = 396$ ,

$\bar{X}_2 = 37$ ,

$S_1 = 178.7106$ ,

$S_2 = 13.9284$ ,

$S = 126.7507$

And using all these values in the Student's  $t$  test, we get

$$t = \frac{396 - 37}{126.7507} \sqrt{\frac{6 \times 6}{6 + 6}} = 4.9057$$

But,  $t_{0.05}$  ( $v = 10$ ) = 1.372

## CONCLUSION AND RESULTS:

Since the critical value is  $<$  the actual value

So the hypothesis at 95% confidence is rejected and is significant.

Hence the Result of comparison is failed which is only because the endurings are generally admitted to the nearest hospital that provides more facilities with basic needs. It is nature of human beings that more comfort and facility with minimum expenditure is preferred. Although the result is not according to the expectation but still there is need to study about the results of cancer as people are going to be affected by cancer in Punjab, Haryana and Rajasthan at a very high rate.

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