# BIOMEDICAL STATISTICAL INFERENCE: WEIGHTED FOURIER SERIES APPROXIMATION IN THE PARAMETER ESTIMATION

**A THESIS**

**Submitted to**

**Saurashtra University**

**Rajkot**

**For the Degree of**
**DOCTOR OF PHILOSOPHY**

**In**

**STATISTICS**

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# CERTIFICATE

**This is to certify that the thesis entitled "Biomedical statistical inferences weighted Fourier series approximation in the parameter_estimation", which is being submitted by Kumari Rajeshree H. Mengar for the award of degree of Doctor of Philosophy in statistics to Saurashtra University, Rajkot embodies the work of the candidate carried out by him under my supervision and guidance. Her work and progress have been satisfactory and according to my opinion the thesis may be submitted for the award of the degree of Doctor of Philosophy in statistics.**

**Date:** **Name of Guide**

**Place:**

**(Dr.G.C.Bhimani)**

# Declaration

**I here by declare that, the present work computed in the form of thesis entitled "Biomedical statistical inference: weighted Fourier series approximation in the parameter estimation", is an original work and has not been published or submitted before in any form for the fulfillment of any other degree; to this or any other University.**

**(Rajeshree H Mengar)**

**Rajkot**

**Date:**

## Acknowledgement

**Thanks", the word to express feelings of gratitude is hardly adequate but still essential. I am taking this opportunity to thank individually, all those who have helped me in one way or the other with my PhD work. First of all, I would like to thank my guide, Dr. G.C.Bhimani, for providing me with the opportunity to complete my research work and for his whole hearted support and guidance in the completion of this work.**

**I would like to extend my deepest gratitude to Dr. R.G.Bhatt Head of the Department of Statistics, School of Science, Gujarat University, Ahmedabad for her help in my research work. She helped and guided me right from the selection of the topic to writing the thesis. Without her help and moral support, completing this work would have been impossible. I also thank Dr. Khadarbhai, Rollwala Computer center, Gujarat University, ah. Who help me for data analysis.**

**I would like to thank cancer research center (GCRI) Ahmedabad for give me a data.**

**I would like to thank the Management & the principal of c.u.shah arts college, ah' where I am employed, for granting me permission to do my PhD.**

**Last but not least, I am greatly indebted to my dady &mummy for their understanding, patience and support during the entire period of my study.**

**Not mentioning anybody's name in this formal acknowledgement does not indicate any lack of gratitude in my mind, but is only due to limitations of space.**

**I am thankful to all of you, for helping my PhD work.**

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# CHAPTER 1

# INTRODUCTION

# CHAPTER 1 INTRODUCTION:

## 1.1 BIOSTATISTICS:

- Biostatistics is the applcation of static's to biology. It is frequently associated with applications to medicine and to agriculture. Biostatics may be defined as the application of the statically methods to the problem of boilogy, including human biology, medicine and public health. It is also known as biometry. Biostatistics is the branch of statistics applied to biological or medical sciences. Biostatistics is also called biometry. The Greek roots are bios and Merton measured, hence biometry means measurement of life. It may be stated as the application of statistical methods to the solution of biological problems. Biostatistics. Covers applications and contributions not only from health, medicine and nutrition but also epidemiology, anthropology and many others. Biostatistics of applications. Biostatistics is an applied scientific discipline rather then a basic or fundamental study. Its roots lie in mathematics, but its branches touch all areas of biology, medicine, nutrition and public health.

  Biostatistics: when the data is being analyzed or derived from the biological sciences and medicine, we use the term 'bio-statistics' to distinguish this particular application of statistical tools and concept."

  "Medical statistics or biostatistics can be called quantitative medicine."

  "Active participation and involvement of statisticians is extremely essential for the formulation of research programmers not only in the field, but also in the clinic and the laboratory and for the interpretation of data. It is also important that research scientists get adequate training at least in elements of biostatistics. By the same taken, it is also important that biostatisticans

who are involved in health and nutrition research acquire basic knowledge with respect to health and nutrition science."

Biostatistics can be divided into two subcategories: descriptive biostatistics and inferential biostatistics:

**1. Descriptive Biostatistics:** It is the study of biostatistical procedures which deal with the collection, representation, calculation and processing, i.e., the summarization of data to make it more informative and comprehensible. It involves graphical and tabular approaches to describe, summarize and analyze the data. The primary function of descriptive statistics is to provide meaningful and convenient technique for describing features of data that are of interest. The failure to choose appropriate descriptive statistics often leads to faulty scientific inferences. The field of descriptive statistics is not concerned with implications or conclusions that can be drawn from the sets of data. It is basically a device for organizing data and bringing into focus their essential characteristics for the purpose of conclusion.

**2. Inferential Biostatistics**: It constitutes the procedures which serve to make generalizations or drawing conclusions on the basis of the studies of a sample. This is also known as **sampling biostatistics**. Statistical inference is most often limited to the quantitative aspects of the generalization but more often a biostatistician is asked to contribute to the process of reaching substantive conclusions as well. The study of the quantitative aspects of the inferential process provides a solid basis. On which the more general substantive process of inference can be founded. By virtue of experience, a biostatistician can frequently be in a position to make contributions to a substantive inference.

## SAMPLE AND TEST BIOSTATISTICS:

In biological studies, two types of statistics are used. These are:

1. **Sample Statistics**: Sample statistics are generated from data used to estimate population parameters like mean, standard deviation, etc. Sample statistics are used to define the nature and distribution of the data. These are calculated immediately to give the biologist a first approximation look at his results. Sample statistics often provide information as to whether the results are significant or not.
2. **Test Statistics**: Test statistics are used to test hypothesis about one or more samples of data. The statistical test chosen for analysis depends to a great extent on the experimental design and the type of the analysis when designing the data collection format. In such cases, the experimental design usually does not dictate the statistical test or vice-versa, but they remain coordinates, e.g., chi square test.

Biostatistics focuses on the development and application of statistical Techniques to address problems in health-related fields, including epidemiology, medicine, and public health. Biostatisticians are indispensable team members for any research study. They help formulate the scientific questions to be answered, determine the appropriate sampling techniques, coordinate data collection procedures, conduct statical analyes to answer the scientific questions, and help write up the final results. Often, to fully address the scientific questions of interest, the biostatistician will develop new statistical methodology interests of the current faculty in the division include (incomplete) longitudinal data, causal inference, survival analysis, statistical genetics, and Bayesian inference. Within the University of Florida's Division of

Biostatics, the research problems are as diverse as studying the impact of educational programs on obesity, developing new stem cell therapy to repair brain damage associated with oxygen deprivation at birth, assessing the impact of the environment on human health, testing of new drugs to control asthma, identifying genes realated to recovery from traumatic brain injury, determining the mechanism of the effect of exercise on smoking cessation, developing new approaches to assess vaccine efficacy based on validation samples, and assessing interventions to prevent lower back pain industry.

## (1.2) BIOMEDICAL STATISTICS:

Biostatistics is the applicaton of statistical techniques to scientific research in health related fields, including medicine, biology, and public health, and the development of new tools tostudy these areas. Since the beginning of the twentieth century, the field of biostatistics has become an indispensable tool in improving health and reducing illness. [1] Biostatisticians play essential roles in designing studies, analyzing data and creating methods to attack research problems as diverse as

- The determination of major risk factors for heartdisease, lung disease and Cancer.
- The testing of new drugs to combat AIDS.
- The evaluation of potential environmental factors harmful to human health.
- such as tobacco smoke, asbestos or pollutants [1]

### ➢ Survival Analysis:

Survival analysis concerns the statistical modeling of time-to-outcome data, I.e. data where the variable of primary interest is the time interval between some specified origin and the event of interest occurring. The event of interst susually referred to as the outcome or endpoint (other terms Include terminating or target event, or failure).

Survival data may also be referred to as time-to-event data, lifetime data, failure time data, reliability data, and durationdata or event history data. It arises commonly in applicationsin Medicine, Social Sciences and enengnineering.

### ➢ Clinical Trial:

A clinical trial is a research study to answer specific questions about Vaccines or new therapies or new ways of using known treatments. Clinical trials (also called medical research and research studies) are used to determine whether new drugs or treatments are both safe and effective. Carefully conducted clinical trials are the fastest and safest way to find Treatments that work.

- **Resources in Vital and Health Statistics: Finding and Using Statistics**

Identifying sources of relevant health-related statistics can be a challenge. Statistics are kept by groups as diverse as the World Health Organization, The Government of India various department. Unfortunately, due to the Complexity of the information available, there is no single way to start Looking. **Outlined** below are several points to consider when doing your Search?

- **Government or Private agency concerned search area :**

All levels of government, from the Union Government down to individual Cities produce statistics in the course of fulfilling their individual missions.Often these statistics are then made available either in print form or on the Internet. There are also many private foundations and organizations that Make information they collect and produce available to the public. We can identify an appropriate agency, can search their web site and print Publications, or contact the agency directly. Examples of this search Method is: -visiting the Centers for Disease Control statistics – contacting The (Association of Physicians) to find the number of currently

- **Current (Within the last few year) Statistics:**

The time frame of this research will also affect where we find statistics. There is generally a lead time of at least one year before most statistics are published. Need of more current information, try looking in journal and newspaper articles or press releases.

- **Type of statistics (Vital, demographic, health, etc.):**

Vital statistics are records of births, marriages/divorces and deaths. Example: The number of women over40who gave birth in the Gujarat Demographics
Describe a specific population group; often this group is defined by geographic. Example: the number of people who live in the Gujarat.
Health statistics, also called mortality and/or morbidity statistics, detail the incidence of certain diseases and conditions.
Example: the number of deaths related to illegal drugs (note: this information may also be found both in vital statistics and in mortality and morbidity reports).

## ➢ Level of statistics:

Locating statistics on a national or international level is very different from locating statistics on a local level. Generally, it is good ideas to use a source as close (in approximation) to the area are researching as possible.

## ➢ Alpha:

Alpha is the probability of rejecting a true null hypothesis. It is the probability that the investigator will conclude that a relationship exists between independent and dependent variables when no such relationship exists. It is represented by the lowercase Greek letter alpha.

## ➢ Beta:

Beta is the probability of accepting or retaining a false null hypothesis. It is the probability that the investigator will conclude that no relationship exists between independent and dependent variables when such relationship does exist. It is represented by the lowercase Greek letter beta.

## ➢ Binomial Distribution:

The family of binomial distributions is a category of discrete frequency distributions showing distributions of events having two possible outcomes, like success or failure. Consequently, if you know the probability of success on any given trial, binomial distributions can be used to predict probabilities of given numbers of successes in given numbers of trials. This means that a researcher can determine whether an empiricaldistribution deviates significantly from what would typically be expected.
Binomial distributions are important to the clinician because they can be used to represent many situations which have two possible outcomes (e.g., success/failure, life/death, improved/not improved, pregnant/not pregnant, etc.).

## ➢ Box Plot:

A box plot or box and whiskers plot is a graphical way of representing the salient features of a distribution. It can be used with either Gaussian or non-

Gaussian distributions. The box plot shows a rectangle stretching from the first to the third quartile of the distribution, these quartiles, the edges of the box, are called "hinges". The box displays in a pictorial fashion the variability in the data. A line inside the box shows the approximate positionof the median. If the median is not in the middle of the box the distribution is skewed. The further the median is from the middle, the more skewed is the distribution. The box contains 50% of the data in the distribution. The box and whisker plot has lines extending from the box showing the approximate regions occupied by outliers and extreme values.

- **Causal Relationship:**

A causal relationship among variables is a relationship among variables in which changes in one variable produce changes in another variable. Changes in one variable affect another variable. Changes in one variable depend on changes in another variable.

- **Central Tendency:**

Measures of central tendency are summary statistics or descriptive statistics used to indicate the central location of a group of data values. The three most commonly used measures of central tendency are the mean, the median, and the mode.

- **Chi Square Tests:**

Chi-Square tests are frequently used to dected significant relationships between two variables measured on norminal scales, or to determine whether a distribution differs significantly from the class of statistical inferential procedures known as nonparameteric or distribution free tests.

- **Correlation:**

Correlation referes to the degree of relationship among variables. Correlation coefficients are a measure of the degree of relationship among variables. There are many correlation coefficients. Two of the most important measures are the Pearson product moment correlation coefficient (Often used with ordinal measures and or non-Gaussian variables). The Pearson is parametric and the Spearman is a nonparametric measure of relationship.

## ➢ Dependent Variable:

In an experimental setting, dependent variable refers to the variables which are observed by the experimenter.More generally dependent variables values depend upon the values of independent variables.

## ➢ Distribution:

A distribution or, more formally, a frequency distribution is simply a table, chart or graph, which pairs each different value obtained from a sample or population with the number or proportion of time it occurs. So, any time a set of values is obtained from a sample, each value may be plottes against the number or proportion of times it occurs using a graph having the values on the horizional axis and the counts or proportions on the vertical axis. Such a graph is a very conveninent way to represent a frequency distribution.

## ➢ Effect size:

Effect size refers to the size of the effect produced by the independent variable on the dependent variable in a research study. For example, if the study compares the effectiveness of two treatments on the dependent variable, the difference between the mean is the effect size. Medical before conducting a research study because the size of the effect plays an important role in determining the statistical power, and thus the optimal sample size for conducting the research.

## ➢ Empiricial:

An empirical effort or process is one which is data-based. The fundamental difference between scientific research and other methods of inquiry is that scientific research is data based. A fundamental tenet of the scientific method is that an outcome or result is not regarded as valid until there is a substantial body of hard evidence or data to support it. Another way to say this is that empirical studies are ones which make use of hypothesis testing or reality-testing to determine whether assertions, hypothesis, or theoretical frameworks will be regarded as valid.

## ➢ Exploratory Data Analysis:

Exploratory Data Analysis (EDA) provides a simple way to obtain a big picture look at the data, and a quick way to check data for mistakes to prevent contamination of subsequent analyses. Exploratory data analysis can be thought of as preliminary to more in depth statistical data analysis. Box plots are a primary tool in exploratory data analysis.

## ➢ Gaussian distribution:

The family of Gaussian or normal distributions is a category of frequency distributions fitting a precise mathematical model. When plotted on a graph, they are characterized by continuous, symmetrical, bell-shaped curves. These curves represent the mathematical law of errors. The curves precisely describe the phenomenon that measurements often include small errors, and that as errors become larger they decreases in number. Gaussian distributions are important to the clinician because they represent many situations where a condition is the result of a variety of factors summing together.

## ➢ Independent Variable:

In an experimental setting, independent variable refers to the variables that are manipulated by the investigator; more generally, Independent variables are the causes or causal factors in medical research studies.

## ➢ Inferential Statistics:

Inferential statistics concern that branch of statistics that has as its primary focus generalizing from samples to populations with knows degree of accuracy and probabilities. Inferential statistical methods allow us to compare small random samples and then to make statements about the much large populations they represent with known probabilities of truth.Inferential methods typically take the form of statistical tests. Examples: Chi-square tests, t-tests, Analysis of variance, Kreskas-Wallis test, z-tests, etc.

## ➢ Instuctions:

Biostatistics for the clinician accepts input from either the mouse or keyboard and is designed to be displayed using netscape navigator 3.x or a

compatible web browser in the standard fashion. It uses the standard point and click interface of the netspace browser and so is quite intuitive and easy to use. Use the mouse or arrow and Enter keys to make selections from the menus or move though the document, or navigate using the scroll bars.

Use the left mouse buttion to click on arrow icons or scroll bars to navigate.Move the mouse cursor to the location of your choice, and then click the left mouse button to activate that selection.Hyperlinks appear underlined. Click on any hyperlink to activate the link and navigate to the location address by the link.Tables of contents contain hyperlinks to the various sections. Whithin the bodies of the text many substantive terms appear as hyperlinks. These are typically linked to the hypertext Glossary.Any time you seek further information about one of these coccepts, simply click on the link to go directly to that term in the glossary.To return to your previous positions press the "Back" button on the netscape toolbar.

- **Interquartile Range:**

The Interquartile Range of a distribution is one of the measures of variability of a distribution. It is the difference between the value at the $3^{rd}$ quartile ($75^{th}$ percentile) and the value at the $1^{st}$ quartile ($25^{th}$ percentile) of a distribution.

- **Interval Variables:**

Interval Variables, the third level of measurement, have all the properties of ordinal variables, but in addition have the property that equal differences between measures represent equal differences in the values of the variable. A variable must be at least interval to be able to compute a meaningful average.

- **Lesson:**

Each Main Menu Option from the represents a self-instuctional lesson that can be chosen and used to learn, present, practice or review statistics concepts and skills. Use the arrow keys or mouse to select the desired lesson. Lessons typically have a number of sections also accessed from menu. The browser interface is quite intuitive and consistent with typical

graphical user interface standards. Click on the "Back" button to return to previous documents or higher level menus.

### ➢ Level of Measurement:

"Level of Measurement" rerers to the four different (nomial, ordinal, interval, ratio) hierarchically ordered types of variables.

### ➢ Mean:

The mean refers to the average. It is one of the most useful measures of central tendency. The mean is calculated by finding the sum of the measures and dividing by the number of measures.

### ➢ Measurement:

Measurement is a systematic process of assigning names, labels, or numbers to the different values of a variable.

### ➢ Median:

The median is one of the three most commonly used measures of central tendency. It is the middle value or $50^{th}$ percentile in a distribution. It is often used in nonparametric statistical procedures. It also appears in box plots. The median is often preferable to the mean as a measure of central tendency when distributions are skewed.

### ➢ Mode:

The mode is summary statistics and is one of the three most commonly used measures of central tendency. It is the most frequent value in a distribution. The mode may be preferable to the mean as a measure of central tendency, particularly with multimodal (many modes) distributions.

### ➢ Nomial Variables:

Nomial Variables are the lowest level qualitative variable and the lowest level of measurement Nominal measures simply name, group, type, classify or categorize values of a variable.

## ➢ Nonparametric Tests:

Nonparametric statistical procedures are sometimes referred to as distribution free procedures. In general these procedures can be used with nominal or ordinal measures and do not have assumptions requiring that distributions of variables be of certain shapes (in contrast to parametric procedures which invariably require normal distributions and interval or ratio measures). Examples of nonparametric procedures include the Chi-square tests, and the spearman rank Correlation Coefficient.

## ➢ Null Hypothesis:

The Null Hypothesis is a statement inferring there is no difference between population parameters. That is, there is no relationship between independent and dependent variables in the population under study. Typically, this is not the anticipated outcome of an experiment. Usually the investing-gator conducts an experiment becauses he/she has reason to belive manipulation of the independent variable will influence the dependent variable. So, rejection of the null hypothesis is interpreted as a significant finding.

## (1.3) BIOMEDICAL STATISTICAL INFERENCE:

Given the distributions of the variable in a population we obtained results about the distributions of various quantities, such as mean and variance, calculated from sample observations. These results are of direct interest in the planning of sampling enquires, as they enable the investigator to estimate the precision attainable with a biomedical sample of a given size and hence to decide how large a sample should be taken.

When the biomedical sample has been taken, what sort of inferences can be drawn about the population on the basis of the sample? The argument here must in the opposite direction to that previously used. We do not know the characteristics of the population. We have taken the one random sampleWhatever inference can be made about the population. One fundamental difficulty usually arises. The expressions of sampling variation given by the various formulas. If we are attempting to make an inference about a normal distribution on the basis of one random sample.

We shall continue to suppose that the data at our disposal from a random sample from and wish to use our biomedical knowledge of sample theory to make some population. In some sampling enquires this is known to be true by virtue of the design of the investigation. A more serious conceptual difficulty is that in many statistical investigations difficulty is that in many statistical investigations there is no formal process of sampling from well-defined population. For instance the prevalence of the certain disease may be calculated for all the inhabitants of a village and compared with that for another area. A clinical, trial may be conducted in a clinical, with the participation of all patients seen at the clinic during a given period. A doctor may report the mean duration of symptom amongst a consecutive

series of patients with a certain form of illness. Individual readings very haphazardly whether they from a random sample or whether they are collected in a loss formal way, and it will often be desirable to assess the effect which this basic variability has on any statistical calculation that are performed.

It can be done by arguing that the observations are subject to random, unsystemic variations, which makes them appear very much like observations on random variables. The population formed by the whole distribution is not a real, well-defined entity, but it may be helpful to think of it as a hypothetical population which would be generated if an indefinitely large number of observations showing the same sort of random variation as those at our disposal could be made. This concept seems satisfactory when the observations vary in a pattern less way, putting forward a model or conceptual framework, for the random variation and propose to make whatever statement we can about the relevant features of the model. Just as wish to make statements about the relevant features of a population in strict sampling situation. The supposition that the data behave like a random sample is blatantly unrealistic. There may be a systematically tendency for the earliest observations to be greater in magnitude then those made later. When such modifications have been made, there will still remains some degree of apparently random variation, the underlying probability distribution of which is a legitimate object of study.

It will be of considerable importance to compare two or more groups of observations made on units receiving different treatments, and to assess the extent to which such contrasts are affected by random variation. In most experiments the whole collection of units not selected by strictly random sampling in the clinical trial. Never the loss, because of random allocation

the differences between groups behave like differences random samples-from the sample population of all treatments differ in their effects. The sampling theory of differences is therefore directly relevant.

The methods of statistical inference provide a largely objective means of drawing conclusion from the data about the issues under biomedical research. Jeffrey 1965, Good 1950, Sewage 1954, Lindley 1965 have advocated subjective probability method as the basis of statistical inference.

Parameter estimates obtained from samples are usually meant to be used to estimate the true population parameters. The sample mean and variance are typical estimators or predictors of the true mean and variance, and are often called point estimates. In addition, an interval that is apt to contain the true parameter often accompanies and complements the point estimates. These intervals, known as confidence interval, can be constructed with a know a priori probability of bracketing the true parameters. Confidence intervals play an important role in the evaluation of drug and drug products.

The question of statistical significance pervades much of the statistics commonly used in pharmaceutical and clinical studies. Adverting, Competitive claims, and submissions of supporting data for drug efficacy to the fda usually require evidence of superiority, effectiveness, and/or safety based on the traditional use of statistical hypothesis of testing. This is the technique that leads to the familiar statement, The Difference is statistically significant Many scientists and statisticians feel that too much is made of testing for statistical significance is one of backbones of standard statistical methodology and the properties and application of such test are well understood and familiar in many experimental situations. This

aspect of statistical is not only important to the pharmaceutical scientist in terms of applications to data analysis and interpretation, but is critical to an understanding of the statistical process.

## Biomedical Statistical inference:

A conclusion about a population or universe on the basis of information contained in a sample, a statement about a parameter based on the observed value of the Corresponding statistic. If our sample of Indian women aged 40 to 49 was selected in a particular way (involving probability and randomness) , we may be able to conclude on the basis of an observed average resting heart rate of the population is likely to lie between 70.13 and 72.13 (values of the parameter). Note that we never know population values exactly, since we have studied only a part of the population, i.e. a sample. Statistical inferences utilize the laws of probability.

## (1.4) IMPORTANCE OF BIOMEDICAL STATISTICS:

The role of clinical research is vital in establishing a standard of care such research is best performed using an interdisciplinary approach that combines efforts of the clinician and statistician from the conception of the study through data analyses and interpretation. The choice of the study design depends upon the research questions to be answered, the population available, the resources and effort to be extended. If the findings of a study reveal a statistical association, the validity of this association may be accepted after carefully ruling out alternate explanation such as chance, bias, and confounding. Further, the association may be more credible. If it is a consistent finding in other biomedical studies as well.

The analysis of the data collected systematically in biomedical studies includes the determination of whether a statistical association exists between presence and absence of a factor and observation problems. If a statistical association is observed it is important to rule out alternate explanations such as the luck of the draw systematic errors in collecting or interpreting the data(bias), or the effects of other associated variables(Confounding). Generally, in a biomedical statistical studies the researcher selects a study population that has a high risk of developing the outcome or response variable. Eligibility criteria for inclusion in the study must be clearly defined of the beginning of the study. Data from base line and subsequent visits must be collected in a systematic proceeding. The response or outcome variable that is to be measured must also be clearly defined.

Sample size calculations must be performed in the initial development phase of all analytic studies, but they are particular important in a biomedical studies. The studies must have a sufficiently large sample size to have adequate statistical power to detect difference between groups considered to be of biomedical interest. The proportion of individuals in each study are that develop the predetermined outcome is calculated and effects of the intervention are compared, monitoring of non-compliance and adverse side effects is an important aspect of study.

Branches of science depends precision for its development and medical science is no exception with the scientific advances in modern medicine, including public health, there has been felt an increasing need for objectively, so that data may be properly processed and correctly interpreted with inferences, leading to conclusions that may stand the tests of significance, Even before the observations are made and data collected, experiments have to be designed and surveys planned keeping in mind the subsequent statistical analysis data that is why it is very important for Biomedical statistical studies.

***"The Importance of Statistics in Medical Science"***

When considering the topic of this article many will think only of The application of statistical methods to the analysis of data arising in the Medical sciences. Some would also include"…**and to the Interpretation of the results**." It is true that the proper application of statistical methods to the analysis of data arising in the medical sciences and the interpretation of the results are crucial to the understanding of the underlying medical scientific phenomena and to advancing knowledge and practice, but knowledge and practice are not advanced in the absence of appropriate attention to the **design of medical experiments** at the outset. No amount of statistical methodological gymnastics can salvage a poorly designed experiment.

There simply is no statistical fix at the analysis stage for a poorly designed or poorly conducted experiment (**1**). All experiments in the medical Science should **begin with a medically important question** that can only be answered by conducting an experimentalin. In my 30 plus years of working in and consulting to the pharmaceutical industry engaged in the discovery, research and clinical development of drugs, biologics or medical devices, I consider helping to define the objective of the investigation and contributing to developing a quality investigational plan (protocol) – including the most appropriate experimental design, to be of far greater importance than statistical analyses of data collected during the conduct of the investigation (**1, 2**). In 1974, I recall hearing Dr. Clyde Kramer, who made his mark by developing a statistical consultation function for Scientists engaged in Agricultural Research at the Virginia Polytechnic Institute and State University in Blacksburg, Virginia, USA, and who published an excellent primer on multivariate analyses lamenting his early experience. He said that when he begandeveloping the statistical consulting function, that Agricultural Scientists would bring their data to him for statistical analysis. He coined PARC as the acronym to describe this process: Plan after Research Completed.

He further stated that by commuting the letters in the acronym one produced a word that most often described the worth of the experiment. I experienced this same phenomenon early in my career – declining to analyze data from experiments which were flawed to the extent of having no basis for valid statistical inference.statistical or biostatistical input to medical science experiments should occur at all stages: Planning, development of the protocol [defining the question, identifyingthe data or endpoints reflecting the question, choosing the most appropriate experimental design, determining the needed number of participants, and developing the statistical analysis section (**3**)], during the conduct of the experiment, computerizing the data, statistical analysis and interpretation of results and report development. Medical scientific experiments are more likely to be successful and reflect greater quality if overseen by a Medical Scientific Team. The nucleus of this team is the medical scientific researcher and the biostatistician, but other professionals: database management expert, head of the monitoring staff, an expert on regulatory aspects of the experiment, head of the quality assurance department, and medical writer, contribute in a major way to the success of the experiment.

In my next column, I will address “Requirements for the Validity of Statistical Inferences from Medical Scientific Experiments.” Then succeeding columns will highlight real examples from my own experiencein the clinical development of 1. Fixed combination drugs; 2. Drugs to treat or prevent ulcers; 3. Drugs to treat angina; 4. Drugs to reduce CHD risk; 5. Drugs to treat panic attacks; and 6. Drugs to treat Alzheimer’s disease.

Analysis and interpretation of results and report development. Medical scientific experiments are more likely to be successful and reflect greater quality if overseen by a Medical Scientific Team. The nucleus of this team is the medical scientific researcher and the biostatistician, but other professionals: database management expert, head of the monitoring staff, an expert on regulatory aspects of the experiment, head of the quality assurance department, and medical writer, contribute in a major way to the success of the experiment.

## (1.5) USE OF BIOSTATISTICS:

### 1. In Physiology and Anatomy:

Biostatistics is used for the purpose of study of a normal and a healthy population and for imposing limits for abnormality. It is also used in physiology and anatomy. For example: in studying the mean pulse rate, mean and variance of height and weight and their correlation in a healthy person.

### 2. In Pharmacology:

To find the action of a drug, biostatistics is used in pharmacology. For example if drug is given to certain population the changes produced in the health due to drug effect can be studied. It can be used for comparing the action of two different drugs two successive dosages of the same drug or to assess the relative potency of the drug.

### 3. In Medicine:

Biostatistics is used to compare the efficacy of a popular drug. It is also used in operation or in a line of treatment. It can be used to find an association between two attributes such as cancer and smoking or filariasis and social class or to identify the symptoms of a disease or a syndrome cough.

### 4. In a surgery:

Biostatistics is used in surgery to find the measurement of bile duct or intestine or organ to be transplanted or where certain statistical measurements and characteristic are required to be ascertained before performing operations.

## 5. In community medicine and public health:

Biostatistics is used extensively in community and public to find the usefulness of sera and vaccines in the field, percentage of attacks or deaths among vaccinated. It is also compared with that among the unvaccinated to find whether the difference observed is statistically significant. It can also be used for epidemiologically studies to find the role of causative factors. For example: deficiency in calcium in iodized salt. In public health, the measures adopted are assessed. Also it is helpful for finding whether the lowering of morbidity rate in typhoid after pasteurization of milk may be attributed to clean supply of milk if it is statistically proved. Fall in birth rate may be the result of family planning or higher age of marriage or due to rise in living standards.

## (1.6) APPLICATIONS OF BIOSTATISICS:

Application of biostatistics is not restricted to certain experiments but is used in a wide variety or contexts. Some of these applications are as follows:

### 1. Genetical Statistics:

In Classical or Mendel Ian genetics the focus of interest is centered on The inheritance of qualitative characters. The statistical methods Generally applied are binomial or chi square tests. For example, With the use of chi-square test which deals with observed and Expected frequencies we can test whether or not the new generations Follow the Mendalian ratios. We can also study the Testing the Agreement of observed frequency data with those expected or derived By hypothesis of Mendelian segregation was the major task and this Include problems such as detection and estimation of linkage. This falls In the preview of Genetical statistics.

**Population genetics is** concerned with studying genetic structure of populations and changes occurring in it over generations. The evolutionary changes that occur in a population are due to forces of evolution such as mutation, migration, isolation and selection. The frequencies of different genes and their changes due to the effect of these forces can be estimated with the application of different statistical methods. There are also effects related to small population size and consequent inbreeding. The applications of statistical methods have made it possible to trace the consequences of these effects in a population through abstract models.

To study the behavior of genes in a population which is concerned with changes in the frequency of genes in the population statistical methods are

applied, e.g., the relationship between allelic and genotypic frequencies is justified by applying binomial equation.

**Population and Applied Genetic**: The traits exhibiting continuous variation, which are often controlled by two or more genes are termed as polygenic and where several genes, make additive contribution to the phenotype, the trait is know as **quantitative or continuous variation.** To study such traits various statistical methods are used by the geneticists, like in twin studies, Weinberg's differential method is used to estimate the frequencies of monozygotic or dizygotic twins.

## 2. Numerical Taxonomy:

Numerical Taxonomy deals with grouping of taxonomic units into taxa by numerical methods on the basis of their characteristics. The term includes the drawing of phylogenetic inferences from the data by statistical methods. The major advantage of using numerical methods for classification is repeatability and objectivity. After having chosen the organisms and contrasting taxa based upon these resemblances are worked out. Generalizations are then made about taxa such as phylogeny, choice of discriminatory characters, etc.

Apart from classification, the problems of identification are important facets of taxonomic studies. The problem of identification is that of placing an unknown **operational taxonomic unit** (OUT)

Into one pre-established taxon based on the character-set observed in the specimen at hand.Numerical taxonomic methods are also used in fields outside systemic biology. Major applications have been recorded in ecology, biogeography, social and earth sciences.

## 3 Statistical Ecology:

Most of the statistical applications in ecology deal with the study of Temporal and spatial patterns of populations of organisms. The Ormer is described as population dynamics and the latter as **Statistical ecology.**

Ecologists frequently measure the environmental variables along With the observations on the organisms in their habitats. Studies on Vegetation/animal versus environment is amendable to such Analysis. An extension of canonical correlation analysis is called Multiple discriminant analysis.

It operates on several sets of qualitatively similar variates When the units for observations are discrete a simple test for association of two species or groups within the sample is provide by chi square value computed out of the contingency table. When more than two species are studied together, the results are not straight forward and need appropriate grouping of the frequency classes.

Two major aspects of interest with many species populations are species abundance relations and measurement of directivity. The species abundance relations are studied through distributions like lognormal, negative binomial and geometric distribution. These functions determine approximations to relationship between a number of species and a number of individuals and make it possible to predict the total number of species in the whole population from the observed number of species in the sample.

## 3. Statistical Ecology:

Behavioral studies in the usual cases yield time series data. Data is

Either collected from complete records of the events or from Observations at fixed intervals of time or on the sequence of Activities on local animals or their groups without a time base.

Duration, interval and latency of behavioural acts are of ethologists. If the events in a time series are independent of one another there will be no significant correlation among the time of their occurrences. Auto-correlation coefficient may be used to determine the existence of such correlations.

Cluster analysis is particularly preferred for ethological work. Cluster analysis proceeds by computing similarity measures between behaviors and grouping the entities by application of one of several algorithms available for this purpose. Cluster analysis is helpful in identifying common casual factors in behavior of different organisms or groups. But this needs to be applied with caution.

Many significant results may be gained from multivariate data through principle component and factor analysis for the purpose of examining variations within a population. Multivariate analysis of variance and discriminant analysis Technique provides powerful qualitative tools to examine the pattern in inter-group behavioural phenomena.

## 4. Forest Mensuration:

In forestry measurement of tree length, area or volume and weight are measured in some cases but it is different to be measure these attributes in many other cases. The prediction of those attributes which are difficult to be measured directly in terms of easily measurable characteristics is the crux of mensuration problem. Since

the prediction is probabilistic in nature, the science of statistics plays a major role in this field.

## 5. Forest and Agricultural Yield Table:

Yield table is a tabular statement which gives an idea of the developing crop, forest product or animal production. Yield tables have multiple uses in the management of crop, forest production, animal husbandry, fish production, etc. The standard regression techniques have gained wide acceptance for the construction of yield equations.

Volume yield of a tree is the output of a regression function with tree volume as the dependent variable and diameter and/or height as independent variable(s). In practice the best suited function of a set of polynomial or exponential models selected is based on some goodness of fit criteria.

To test the effect of different types of manures, levels of irrigation, varieties of crops, etc. and to provide an analytical data, a thorough statistical knowledge is required.

## 6. Biomass Estimation:

Biomass refers to the total mass of living material in a given locality or a given area.The estimation of biomass has assumed considerable importance in recent years. The common procedure of estimation is through the use of regression equations and standard tables. In biomass estimation many theoretical refinements like generalized test squares, stepwise regression, non-linear regression, etc. are used extensively.

## 7. Statistical Environmental Management:

The use of statistical methods is a powerful tool to understand the complex relationship and processes in the environmental biology and its management. Now days, no field of environmental biology is left untouched by statistical technique.

## 8. Cell Function, Endocrinology, Physiology and Biochemistry:

When we deal with the cell functions or biochemical aspects of cell functions or endocrinology, statistical techniques have made enough contribution to these fields of biology. Many workers have used correlation and regression analysis system as basic determinants of cell physiology. Chi-square test has much been used in cell population studies in the physiological and endocrinological experiments. Some multivariate analysis is also useful to estimate resultant effect of different variable factors on a particular cell or endocrine gland.

## 9. Demography:

Demography is defined as the study of measurement of human population. It is the quantitative study of human population with respect to events such as birth, death, marriage, morbidity, migration etc. various statistical methods are used for these studies such as vital statistics, life table technique, population growth.

## 10. Medical Sciences:

Health is a sensitive issue. Health managers are expected to take sound decisions on the basis of whatever bit of in available. These decisions are taken under clouds of uncertainty. Here statistics plays a major role.

## 11. Biological Variation and Uncertainties:

One of the out standing features of all living beings is that no two individuals are exactly alike. Variations are present not only between individuals but also within individuals from time to time. e.g. diurnal variations in body temperature. A large part of statistical efforts are devoted to devising and implementing strategies to keep variations under check. Control of variations is obtained by choosing an appropriate design of study.

Very often it is found that statistical techniques are misused. Inadequate attention is given to the assumptions involved in many of the statistical tests and estimation procedures. Statistical systems have tremendous potential as an educational tool and practical aid for the biologist in choosing the specific techniques that are needed in their research.

# (1.7) FOURIER'S SERIES:

In mathematics, those series which proceed according to sines and cosines of multiples of a variable, the various multiples being in the ratio of the natural numbers; they are used for the representation of a function of theVariable for values of the variable which lie between prescribed finite limits. Although the importance of such series, especially in the theory ofvibrations, had been recognized by D. Bernoulli, Lagrange and other mathematicians, and had led to some discussion of their properties, J. B. J. Fourier (see above) was the first clearly to recognize the arbitrary character Of the functions which the series can represent, and to make any serious attempt to prove the validity of such representation; the series are consequently usually associated with the name of Fourier. More general cases of trigonometrically series, in which the multiples are given as the roots of certain transcendental equations were also considered by Fourier. Before proceeding to the consideration of the special class of series to be discussed, it is necessary to define with some precision what is to be understood by the representative of an arbitrary function by an infinite series. Suppose a function of a variable x to be arbitrarily given for values of *x* between two fixed values a and *b;* this means that, corresponding to every value of x such that aGx-fib, a definite arithmetical value of the Function is assigned by means of some prescribed set of rules. A function So defined may be denoted by *f (x);* the rules by which the values of the Function are determined may be embodied in a single explicit analytical Formula, or in several such formulae applicable to different portions of the Interval, but it would be an undue restriction of the nature of an arbitrarily Given function to assume *a priori* that it is necessarily given in this manner, the possibility of the representation of such a function by means of a single analytical expression being the very point which we have to discuss. The Variable x may be represented by a point at the extremity of an interval measured along a straight line from a fixed origin; thus we may speak of the point *c* as synonymous with the value $x = c$ of the variable, and of $f(c)$ as the value of the function assigned to the point *c.* For any number of points between a and *b* the function may be discontinuous, *i.e.* it may at such points undergo abrupt changes of value; it will here be assumed that the number of such points is finite. The only discontinuities here considered will be those known as ordinary discontinuities. Such a discontinuity exists at the point *c* if $f(c+e)$, $f(c - e)$ have distinct but definite limiting values as e is indefinitely diminished; these limiting values are known as the limits on the

right and on the left respectively of the functionat *c,* and may be denoted by *f(c+o), f(c - o).* The discontinuity consists therefore of a sudden change of value of the function from *f(c - o*) to f(c+o), as *x* increases through the value *c.* If there is such a discontinuity at the point x=o, we may denote the limits on the right and on the left respectively by f (+o), f (- o). Suppose we have an infinite series u 1 (*x) +u2(x)* + ... *+un(x)* + ... in which each term is a function of *x,* of known analytical form; let any value *x = c (a = c =b*) be substituted in the terms of the series, and suppose the sum of n terms of the arithmetical series so obtained approaches a definite limit as n is indefinitely increased; this limit is known as the sum of the series. If for every value of *c* such that *a .c b* the sum exists and agrees with the value of f(c), the series Eu n (x) is said to represent the function (*fx*) between the values *a, b* of the variable. If this is the case for all points within the given interval with the exception of a finite number, at any one of which either the series has no sum, or has a sum which does not agree with the value of the function, the series is said to represent "in general " the function for the given interval. If the sum of n terms of the series be denoted by *S n (c),* the condition that *S n (c*) converges to the value *f(c*) is that, corresponding to any finite positive number as small as we please, a value *n 1* of *n* can be found such that if *n? n 1, I f(c*) - Sn(c) I<S.

Functions have also been considered which for an infinite number of points within the given interval have no definite value, and series have also been discussed which at an infinite number of points in the interval cease either to have a sum, or to have one which agrees with the value of the function? The narrower conception above will however be retained in the treatment of the subject in this article,. Reference to the wider class of cases being made only in connation with the history of the theory of Fourier's Series.

## Uniform Convergence of Series:

If the series u l(x) +u2(x) + ...+ u2(x) + ...converge for every value of *x* in a given interval a to *b,* and its sum be denoted by S(x), then if, corresponding to a finite positive number *S,* as small as we please, a finite number *n 1* can be found such that the arithmetical value of S(x) - S n (x), where n is lessthan S, for every value of x in the given interval, the series is said to converge uniformly in that interval. It may however happen that as *x* approaches a particular value the number of terms of the series which must be taken so that I S(x) - S n (x) I may be <S, increases indefinitely; the

convergence of the series is then infinitely slow in the neighborhood of such a point, and the series is not uniformly convergent throughout the given interval, although it converges at each point of the interval. If the number of such points in the neighborhood of which the series ceases to converge uniformly be finite, they may be excluded by taking intervals of finite magnitude as small as we please containing such points, andconsidering the convergence of the series in the given interval with such sub-intervals excluded; the convergence of the series is now uniform throughout the remainder of the interval. The series is said to be *in general* uniformly convergent within the given interval a to *b* if it can be made uniformly convergent by the exclusion of a finite number of portions of the interval, each such portion being arbitrarily small. It is known that the sum of an infinite series of continuous terms can be discontinuous only at points in the neighborhood of which the convergence of the series is not uniform, but non-uniformity of convergence of the series does not necessarily implydiscontinuity in the sum.

## Form of Fourier's Series:

If it be assumed that a function *f(x)* arbitrarily given for values of x such that o <x <l is capable of being represented in general by an infinite series of the form A 1 sin l x +A2 sin 21x+ ...+A n sin *n i x* + ..., and if it be fui £ ther assumed that the series is in general uniformly convergent throughoutthe interval o to *1,* the form of the coefficients A can be determined.

Multiply each term of the series by sin n l x, and integrate the product between the limits o and *1,* then in virtue of the property f o sin l x sin *ni l x dx = 0,* or Zl, according as *n' is* not, or is, equal to n, we have 2/A 0 = f i *f (x*) Sin e x dx, and? Thus the series is of the form l I sin *n l x* f *of(x*) sin ex... (I) this method of determining the coefficients in the series would not be valid without the assumption that the series is in general uniformly convergent, for in accordance with a known theorem the sum of the integrals of the separate terms of the series is otherwise not necessarily equal to the integral of the sum. This assumption being made, it is further assumed that *f(x*) is such that f of (x) sin n **l x** has a definite meaning for every value of *n.* Before we proceed to examine the justification for the assumptions made, it is desirable to examine the result obtained, and to deduce other series from it. In order to obtain a series of the form Bob--

BI.cos l +Bo cos-1 - + ... +B 0 cos **n** i x + ... for the representation of *f(x)*in the interval o to *1,* let us apply the series (I) to represent the function *f(x)* sin 7 - T x; we thus find 2° E sin n l xx f O *f(x)* sin l x sin *117X x,* or *l* sin n l xJ o *f cos (n1 ') rx cos (n* + ***1 1)7x on rearrangement of the terms this becomes 1* -rx l *2 7rx nirx l l sin l* f '+- / E sin *l* cos *l* f f(x) cos -- *T* hence *f(x)* is represented for the interval o to *1* by the series of cosines if f E cos n *x J f (x)* cos n 1 **x** dx. .. (2) We have thus seen, that with the assumptions made, the arbitrary function *f(x)* may be represented, for the given interval, either by a series of sine's, as in (I), or by a series of cosines, as in (2).

Some important differences between the two series must, however, be noticed. In the first place, the series of sine's has a vanishing sum when x =o or x *=1;* it therefore does not represent the function at the point x = o, unless *f (0)* =0, or at the point x =1, unless *f (1) =o,* whereas the series (2) Of cosines may represent the function at both these points. Again, let us consider what is represented by (1) and (2) for values of *x* which do not lie between o and *1.* As *f(x)* is given only for values of x between o and *1,* the series at points beyond these limits have no necessary connation with *f(x)* unless we suppose that *f(x)* is also given for such general values of *x* in such a way that the series continue to represent that function. If in (1) wechange *x* into - *x,* leaving the coefficients unaltered, the series changes sign, and if *x* be changed into x+21, the series is unaltered; we infer that the series (1) represents an odd function of x and is periodic of period *21;* thus (1) will represent *f(x)* in general for values of x between too, only if f(x) is odd and has a period 2l. If in (2) we change x into - x, the series is unaltered, and it is also unaltered by changing x into x+21; from this we see that the series (2) represents f (*x*) for values of x between too, only if is an even function, and is periodic of period 2l. In general a function *f(x)* arbitrarily given for express by (I) the function 2 { f (x) - f (- x) } which is an odd function, and thus this function is represented for the interval - *1* to *+1* by Z E sin *n fl* t *f(x) - f(- x)I 'sinn lx dx;* ***we can also express z { f (x) +f (- x)}, which is an even function, by means of (2), thus for the interval* – 1 *to* +1 *this function is represented by TT oz{f(x)+f(- x) }dx+ Z E cos n* i *x f O 2{f(x) +f (-* x)} cosn *ix* dx. *It must be observed that f (- x) is absolutely independent of* f(x) *the former being not necessarily deducible arbitrarily and independently for the interval o to* 1. *On adding the expressions together we obtain a series of sines and cosines which represents* f(x) *for the interval* - 1 *to* 1. *The integrals* nrx *f of (- x) cos* - dx, f of (- x) *sin nlx are equivalent to* - f o l f (x) *cos* - 7 - dx, x dx, + o f(x) (x) *sin* n l xdx, *thus***

***the series is*** **ilf** ***I l Ic"*** **n? rx l** ***n? rx n? rxff(x) s*** **i** ***n*** **d** ***x, l*** **nrx** ***E*** **l _i** ***cos*** **l** ***which may be written*** **zlf if (x** ***') dx*** *-??* ***f*** f(x') cos *n ' r(l x') dx'.. .* (3) The series (3), which represents a function *f(x*) arbitrarily given for the interval *1* to *1,* is what is known as Fourier's Series; the expressions (I) and (2) being regarded as the particular forms which (3) takes in the two cases, in which *f (- x) = - f (x),* or *f (- x) = f (x)* respectively. The expression (3) doesnot represent *f(x*) at points beyond the interval - *1* to *1,* unless *f(x*) has a period 2l. For a value of *x* within the interval, at which *f(x*) is discontinuous, the sum of the series may cease to represent f(x), but, as will be seen hereafter, all values of *x* between =oo is neither periodic nor odd, nor even, and is therefore not represented by either (I) or (2) except for the interval o to 1.

From (I) and (2) we can deduce a series containing both sines and cosines, which will represent a function *f(x*) arbitrarily given in the interval - *1* to *1,* for that interval. We can has the value z {f *(x+* ***from the latter by putting*** **x** ***for x in a formula; both*** **f (x)** ***and f (- x) are functions given*** *o) -}-f (x – o)},* the mean of the limits at the points on the right and the left. The seriesrepresents the function at x = o, unless the function is there discontinuous, in which case the series is 2 {f (+o) -1-f (-0)}; the series does not necessarily represent the function at the points *1* and - *1,* unless *f (1) =f (-1).* Its sum at either of these points is II *f (l) +f (- l)}. Fourier's Series. - (a*) Let be given from o to by *f(x) =c,* when o <x < 4l, and by *f(x) = - c* from Zl to *1;* it is required to find a sine series, and also a cosine series; which shall represent the function in the interval.

We have f *l* n7rx IL *nirx 'n7rx o'* sin *1 dx = c f* sin *l dx - c f #1* s *i* n *- 1 - dx* C _ - l (cos nir-2 cos 2nx+1). n7r this vanishes if n is odd, and if n=4m, but if n=4m *+2* it is equal to *4c1/nlr;* the series is therefore 4c - (1.27rx 1 61rx 1 107rx +l r 2 *1* Sn +3 1 s i n +5 s i n l, for unrestricted values of x, this series represents the ordinates of the series of straight lines in fig. I, except that it vanishes at the points o, zl, 1, 21 .. .

## Dirichlet's Integral:

The method indicated by Fourier, but first carried out rigorously by Dirichrlet, of proving that, with certain restrictions as to the nature of the function f(x), that function is in general represented by the series (3), consists in finding the sum of n+i terms of that series, and then

investigating the limiting value of the sum, when n is increased indefinitely. It thus appears that the series is convergent and that the value towards which its sum converges is 2 {f (x+o) +f (x-o)}, which is in general equal to f(x). It will be convenient throughout to take -7r to 7r as the given interval; any interval *-1* to *1* may be reduced to this by changing x into lx/7r, and thus there is no loss of generality.

We find by an elementary process that 1-1-cos (x-x') + cos 2 (x-x') + ... + cos n(x-x') Sln 2n 2 2 sin **1(x' -x)** Hence, with the new notation, the sum of the first **n+I** terms of (3) is I f *f(X)* 51n2fl 2 + (*x x) r* 1 **2** sin a If we suppose *f(x*) to be continued beyond the interval -7r to 7r, in such a way that *f(x) =f(x+27r),* we may replace the limits in this integral by **x+7r, x** -7r respectively; if we then put = 2z, and let f(x') =F(z), the expression becomes ?f I n F(z) s s i n n z z dz, where m = 2n+I; this expression may bewritten in the form **1 f** 2F (z) sin mz dz+ l f; F(-z) sin. Mz dz (4) 7r o sin n z 7r o s i n z we require therefore to find the limiting value, when m is indefinitely increased, off *oF (z) s s z* z dz; the form of the second integral being essentially the same. This integral, or rather the slightly more general one **f** hF (z) sinmz d, z, si z when 0< h<27r, is known as Dirichlet's integral. If we write X(z) =F(z) z the integral sin z becomes f *o X(z) si 'mz' dz,* which is the form in which the integral is frequently considered.

## The Second Mean-Value Theorem:

The limiting value of Dirichlet's integral may be conveniently investigated by means of a theorem in the integral calculus known as the second mean-value theorem. Let *a, b* be two fixed finite numbers such that *a<b,* and suppose f(x), *4(x*) are two functions which have finite and determinate values everywhere in the interval except for a finite number of points; suppose further that the functions f(x), *4(x)* are integrable throughout the interval, and that as x increases from a to *b* the function *f(x*) is monotone, *i.e.* either never diminishes or never increases; the theorem is that jbf()d =*f(a* +0) **f** ¢43 (*x)dx+f(b* -0) f *41(x)dx* when t is some point between a and *b,* and f(a), *f(b*) may be written for f(a+o), *f(b-o*) unless a or *b* is a point of discontinuity of the function f(x).

To prove this theorem, we observe that, since the product of two integrable functions is an integrable function, f *b f(x)4(x)dx* exists, and may be regarded as the limit of the sum of a series *f(xo)0(xo) (xi-xo) +f(xi)4(xi*)

(x2-xi)+ ... +f(xn_i)0(x,_i) (*xn x,,__1)* where *xo = a, n = b* and xi, x 2 ... x,t_1 are n-I intermediate points. We can express *c/, (xr*) (x, +l -x,) in theform Yr. +l -Y,., by K=r ng Y,.=? P (xK-1) (xK - xK-1), Y0 = o. Putting K=r Writing X r for f(x,.), the series becomes Xo (Y1-Yo) +X1 (Y2-Y1) +. . +X,,-1(Yn-Yn.-1) or Yi (X0X 1) +Y2 (X 1X 2) +. +Yn (Xn-1-X.) +YnXn.

Now, by supposition, all the numbers Y 1, Y2. .. Y n are finite, and all the numbers Xr_i-X, are of the same sign, hence by a known algebraically theorem the series is equal to M (X0 -Xn) -}-YnXn where M is a number intermediate between the greatest and the least of the numbers Y1, Y2,. Yn.This remains true however many partial intervals are taken, and therefore, when their number is increased indefinitely, and their breadths are diminished indefinitely according to any law, we have *f b f (d) = {f (a)-f (b)} M+f (b) J* when M is intermediate between the greatest and least values which f ¢4 (x) dx can have, when *x* is in the given integral. Now this integral is a continuous function of its upper limit *x,* and there fore there is a value of x in the interval, for which it takes any particular value between the greatest and least values that it has. There is therefore a value t between a and *b,* such that **M = f! 4(x) dx,** a hence fbf0 dx *=If (a) -f (b)}* f *e (x) dx (b*) f6? (*x) dx =f (a*) f Q *4 +f (b) b (x) dx.* If the interval contains any finite numbers of points of discontinuity of *f(x*) or cp(x), the method of proof still holds good, provided these points are avoided in making the subdivisions; in particular if either of the ends be a point of discontinuity of f(x), we write *f (a+o)* or f (b-o), for *f (a*) or f (b), it being assumed that these limits exist.

## Functions, with Limited Variation:

The condition that *f (x),* in the mean-value theorem, either never increases or never diminishes as x increases from a to *b,* places a restriction upon theapplications of the theorem. We can, however, show that a function *f(x*) which is finite and continuous between a and *b,* except for a finite number of ordinary discontinuities, and which only changes from increasing to diminishing or vice versa, a finite number of times, as *x* increases from a to *b,* may be expressed as the difference of two functions f i (x), *f 2 (x),*neither of which ever diminishes as *x* passes from a to *b,* and that these functions are finite and continuous, except that one or both of them are discontinuous at the points where the given function is discontinuous. Let *a,* S be two consecutive points at which *f(x*) is discontinuous, consider any point *x1,*

such that *a*< x1-0, and suppose that at the points M 1, M 2. M r between a and xi, *f(x*) is a maximum, and at m1, *m 2. m,* it is a minimum; we will suppose, for example, that the ascending order of values is a, M 1, m1, M2 i m2 Mr., M r, x1; it will make no essential difference in the argument if m i comes before M 11 or if M r immediately precedes xi, M r _ i being then the last minimum.

Let (xi) =[.f(M1)-f(a+o)]+[f(M2)-f(m1) ] + .. *+[f (Mr)- f(mr-1)] +[f(x1)- f (mr)];* now let x 1 increase until it reaches the value M r+1 at which *f(x*) is again a maximum, then let 1P(x1) *[f(* Mi)-f(a+)]±[f (M2)-f(mi)l+ + ... *M r m r-1* Mr +1)f (m r)]; and suppose as *x* increases beyond the value M r+i, t ' (x i) remains constant until the next minimum m,.+1 is reached, when it again becomes variable; we see that 1P(x 1) is essentially positive and never diminishes as *x* increases.

Let x(**xi)=** [f(M1)-f(m1)l+[f(M2)f(mi)]+ + *[f (Mr) f (mr)1;* then let x i increase until it is beyond the next maximum Mr+i, and Mr+i, and then let x(x i) = [f (Mi) f (mi)] + [f (M2) f (mi)] *+ [f (M r) f (mr)] + [f (Mr+1) f (xi)]* thus **x (xi**) never diminishes, and is alternately constant and variable. We see that '(x1)-x(xi) is continuous as x i increases from a to 0, and that >L(xi)-x(xi) *=f (x1) f (a+o),* and when x i reaches a, we have tP(g)-x(xi) *=f(a-o) f(a+o).* Hence it is seen that between a and / 3, *f(x) =[1G(x*) +f(a+o)]-x(x), where 1'(x)+f(a+o), ***x(x***) are cntinuous and never diminish as x increases; the same reasoning applies to every continuous portion of f(x), for which the functions 'i(x), *x(x*) are formed in the same manner; we now take f i (x) = (*x) f* (a+o) +C, *f 2 (x) = x(x) +C,* where C is constant between consecutive discontinuities, but mayhave different values in the next interval between discontinuities; the C an be so chosen that neither *fi(x)* nor *f 2 (x*) diminishes as x increases through a value for which *f(x*) is discontinuous. We thus see that *f(x) =fi(x)-f2(x),* where f i (x), *f2(x)* never diminish as *x* increases from a to *b,* and are discontinuous only where *f(x*) is so. The function *f(x*) is a particular case of a class of functions defined and discussed by Jordan, under the name “functions with limited variation " (*functions a variation borne);* in generalsuch functions have not necessarily only a finite number of maxima and minima.

## Proof of the Convergence of Fourier's Series:

It will now be assumed that a function *f(x)* arbitrarily given between the values 7r and +7r has the following properties: (a) the function is holds however large the odd integer m may be.

2. Ifo<a<0<2, sifl mzdz snmz dz-I f s sin mz dz sin z sin a a sin i y where *a* < y < 0, hence *I* f g sin. Mz 2 / 1 *J* dz < - a Sn z m sin a precisely similar proof shows that hence the integrals *JP* si z z dz, 'a' sin mz dz, converge to the limit s zero, as *m* is indefinitely increased.

Everywhere numerically less than some fixed positive number, and continuous except for a finite number of values of the variable, for which it may be ordinarily discontinuous. (b) The function only changes from increasing to diminishing or vice versa, a finite number of times within the interval; this is usually expressed by saying that the number of maxima and minima is finite. These limitations on the nature of the function are known as Dirichlet's conditions; it follows from them that the function is integrable throughout the interval. On these assumptions, we can investigate the limiting value of Dirichlet's

integral; it will be necessary to consider only the case of a function F (z) which does not diminish as z increases from o to 27r, since it has been shown that in the general case the difference of two such functions may be taken. The following lemmas will be required: *I.* since sin dz..._ O 3 {1+2 Cos 2z+2 cos 4z+... +2 cos 2nz} dz = 2 J this result

To find the limit of fF (z) sin mz dz, written in the form sin z.

3. If a > o, f! ° *do* cannot exceed a value theorem *f*`si? J a hence I Lh = J s **0 1 d0 <-2;** ***in particular if a 7r,*** **f** ***s' e*** **° d01- <** ***2. a Again sin B dg = sina g da a B a, a> 0, therefore f a sl B*** **B d0** ***increases as a diminishes, when a*** **°°** ***sin*** **B** ***7r sin*** **B 7r** ***but lim*** **a-of a** ***o de = 2, hence*** **6 de <** ***2, a where a <7r, and <3 where*** **a L** ***7r. It follows that s i n mz dz+ f {F(z)-F(0)} in. nzzdz +f µ {F(z) -F(0)} s sin z z dz where p. is a fixed number as small as we please; hence if we use lemma (t), and apply the second mean-value theorem, oF(z) si nyzzdz 2F(0) z =*** *f'* {F(z) -F(0)} sin zsin mzdz +{F(µ+o)-F(o)} rµ ls s z dz+{F(17 o)-F(o)} feiss mz when 1 lies between ? p. and fr. When m is indefinitely increased, the two last integrals have the limit zero in virtue of lemma (2). To evaluate the first integral on the right-hand side,

let G(z) = {F(z)-F(o)} z, and observe that G(z) increases as z increases from o to 7 .i, hence if we apply the mean-value theorem G) sin mz dz = G(A) *f″`* sin mz dz ' n µ sin °d0 <7rG(p), where o < < A, since G(z) has the limit zero when z =o. If e be an arbitrarily chosen positive number, a fixed value of may be so chosen that 7rG (u) < 2e, and thus that f G (z) sinmz dz < 2. When has been so fixed, m may now be so chosen that 1rF vd - 2 s F (o) <e.

It has now been shown that when m is indefinitely increased f F (z) s i zzdz - 2 F (0) ha s the limit o sin Returning to the form (4), we now 1 (F(z) sin m y dz -11 1 F(- z) 70 0 sin z 7r o hence the sum of *n+z* terms of the series *2l* j tf (x) dx + *7 2; _f(x i ') nir(x-x1) ax* converges to the value 2{ f (x+o) +f (x-o) }, or to *f(x*) at a point where *f(x*) is continuous, provided *f(x*) satisfies Dirichlet's conditions for the interval from *-1* to *1*. *Proof that Fourier's Series is in General Uniformly Convergent.* - To prove that Fourier's Series converges uniformly to its sum for all values of *x,* provided that the immediate neighborhoods of the points of discontinuity of *f(x*) are excluded, we have IJ " F(z)s in z 2 LZdz F(o) <7rG(A) + m s n {F(?, +o) – F(0)} s + m sin 1 [F(17-o)-F(o)} < siri %{f (x+2A) - **f(x**) } +m sin *{f(x+2p.)-f(x)}* 1 *{f(x +, r) - f(x)}*. m Using this inequality and the corresponding one for F(-z), we have IS2.+1(x) f(X) I <72 cosec u [ If(x+2u) -f(x) *I* + If(x - 2 µ) - *f(x)* +A I m cosec µ, where A is some fixed number independent of *m.* In any interval (*a, b*) in which *f(x*) is continuous, a value Al of can be chosen such that, for every value of *x* in (a, *b), I f (x+2, u) f(x) I, f (x - 2 p.) - f(x*) I are less than an arbitrarily prescribed positive number provided µ= A1. Also a value of µ can be so chosen that 4/ 2 cosec /2 where n are an arbitrarily assigned positive number. Take for µ the lesser of the numbers then S - *f(x) (*< n+AI *m* cosec u for every value of x in (*a, b)*. It follows that, since n and m are independent of *x,* I *S2. + 1 – f(x*) I **<2e,** provided n is greater than some fixed value n i dependent only on e. Therefore S 2 7, +1 converges to *f(x*) uniformly in the interval (*a, b).*

*Case of a Function with Infinities.* - *The* limitation that *f(x*) must be numerically less than a fixed positive number throughout the interval may, under a certain restriction, be removed. Suppose F(z) is indefinitely great in the neighborhood of the point z=c, and is such that the limits of the two integrals f c±E F(z)dz are both zero, as is indefinitely diminished, then F(z) sin mz dz denotes the limit when o of sin z fcE F(z) sin mz dz {- *f* 1 F(z) sin mz *d* z, both these limits existing; the sin z c+E sin z first of these

integrals has 27rF(+o) for its limiting value when m is indefinitelyincreased, and the second has zero for its limit. The theorem therefore holds if F(z) has an infinity up to which it is absolutely integrable;' this will, for example, be the case if F(z) near the point C is of the form x(z) (z-c)'μ+ (z), where x(c), *, ′ (c*) are finite, and o <u <1. It is thus seen that *f(x*) may have a finite number of infinities within the given interval, provided the function is integrable through any one of these points; the function is in that case still represent able by Fourier's Series.

## The Ultimate Values of the Coefficients in Fourier's Series:

If f(x*) is everywhere finite within the given interval 7r to +7r, it can be shown that* an, b. n, *the coefficients of cos* nx, *sin* nx *in the series which represent the function, are such that* Na n, nbn, *however F (0) f + a sin m Sn a' f R sin mz 4 a dz <ma' 17. For by the mean* 0<a<7r; *zero.*

See that the limiting value of sin mz dz is2 {F (+0) +F (-0)}; sin z great **n is,** are each less than a fixed finite quantity. For writing *f(x) =fi(x)-f2(x),* we have f ir 7r *f i (x) cos = f i (-7r* +0) f cos *i* (? r-0) f cos *nxdx* E hence J J J-? r with a similar expression, with *f 2 (x*) for *f i (x),* being between r and –7r; the result then follows at once, and is obtained similarly for the other coefficient.

If *f(x*) is infinite at *x=c,* and is of the form ¢(x) K near the point (x-c) *c,* where o< K <1, the integral J *f(x*)? Cos *nxdx* contains portions of the form f xc J () x cos *nxdx x-c)* (*¢(x) f -E x* cos *nxdx;* consider the first of these, and put x = *c+u, c it* thus J becomes. e 4)(c u) cos *n(c+u)du,* which is of the form *o E* cos *n(c+u) ¢(c* fuK *du;* now let nu *=v,* the integral becomes o ¢(+) cos nc ( *n€ cos v* sin *nc nE* sin *v* c 9e n ix *U vK dv - nix f* o 7T-dv;hence **n'--** K f *f(x*) cos *nxdx* becomes, as *n* is definitely increased, J ir of the form ¢(c) cos *nc f o* - -j V dv-sin *nc* j o svp *Vdv* which is finite, both the integrals being convergent and of known value. The other integral has a similar property, and we infer that n'-Ka n, n i -Kb n are less than fixed finite numbers.

## The Differentiation of Fourier's Series:

If we assume that the differential coefficient of a function *f(x*) represented by a Fourier's Series exists, that function f'(x) is not necessarily represent able by the series obtained by differentiating the terms of the Fourier's

Series, such derived series being in fact not necessarily convergent. Stokes has obtained general formulae for finding the series which represent f'(x), f''(x) - the successive differential coefficients of a limited function f(x). As an example of such formulae, consider the sine series (I); *f(x*) is representedby 2 I sin - f o *f(x*) sinnl *xdx;* on integration by parts we have f (*x*) sin *n x dx = n ? [f (+o) t f (l-0*) +I cos n i a {f(a + 0) f (a-0) }] + Nom f o *f')* n i x (*x*) cos **- dx** where a represent the points where *f(x*) is discontinuous. Hence if *f(x*) is represented by the series Fla n sin **nlx,** and f'(x) by the series *1bn* cos **rtl** xx ,we have the relation b n = *l* 'r *an l [f+o*) =f (l-0) + *E* cos **n** a { *f* (a +0)f(a-0) }] hence only when the function is everywhere continuous, and f(+o), *f (l-o*) are both zero, is the series which represents f'(x) obtained at once by differentiating that which represents f(x). The form of the coefficient an discloses the discontinuities of the function and of its differential coefficients, for on continuing the integration by parts we find *a n = n* [f+o f(l-O) + cosna {f(a +0) f(a-0)}] 1 *22 [f'(+0) f'(l - 0) - I* - sin *n* T – { *f' + (0+0) f'* (13-0))] +&c.Where l3 are the points at which f'(x) is discontinuous.

# (1.8) WEIGHTED FOURIER SERIES:

We present a novel weighted Fourier series (WFS) representation for cortical surfaces. The WFS representation is a data smoothing technique that provides the explicit smooth functional estimation of unknown cortical boundary as a linear combination of basis functions. The basic properties of The representations are investigated in connection swith a self-adjoint partial differential equation and the traditional spherical harmonic (SPHARM) representation. To reduce steep computational requirements, a new iterative
Residual fitting (IRF) algorithm is developed. Its computational and numerical implementation issues are discussed in detail. The computer codes are also available at. As an illustration, the WFS is applied in quantifying the amount of grayMatter in a group of high functioning autistic subjects Within the WFS framework, cortical thickness and gray matter density are computed and compared.
IndexTerms—Cortical thickness, diffusion smoothing gray matter density, iterative residual fitting, SPHARM, spherical we have presented a unified theoretical framework for WFS and the detailed numerical implementation issues. WFS are used as a smooth global parametrization of cortical surfaces. It is a very flexible functional estimation technique for scalar and vector data projected onto a unit sphere.

WFS is shown to be a solution of a Cauchy problem in PDE, and for a specific weights, it becomes diffusion smoothing [10].As a special case of WFS when the bandwidth vanishes, the traditional SPHARM can be incorporated into this more general framework. However, WFS was shown to perform better than SPHARM when data are more noisy and discontinuous by not having the significant ringing artifacts. As anapplication of this novel approach, we used WFS as a tool for comparing the gray matter and the cortical thickness in a single mathematical framework. Using the WFS representation as the ground truth, cortical thickness and gray matter density are constructed and compared. In thecortical thickness analysis, the thickness is defined using the WFS-correspondence. Afterwards, the SPM of thickness and gray matter density

Are compared to show the statistically significant regions do not overlap. This surprising result is caused by the negative correlation between

densities and thickness. Increased folding increases the gray matter density while decreasing thickness. This should serve as a spring board for more thorough investigation on comparing cortical thickness and density based morphometric techniques such as VBM.

## (1.9) WEIGHTED FOURIER SERIES APPROXIMATION:

For a continuous-time, *T*-periodic signal *x (t)*, The *N*-harmonic Fourier series approximation can be written as

$$x(t) = a_0 + a_1 \cos (W_o t + \Theta_1) + a_2 \cos (2w_o t + \Theta_2) + \ldots + a_N \cos (Nw_o t + \Theta_N)$$

Where the fundamental frequency $w_o$ is $2\Pi / T$ rad/sec, the amplitude

Coefficients $a_1, \ldots, a_N$ are non-negative, and the radian phase angles satisfy $0 \leq \Theta_1, \ldots, \Theta_N < 2\Pi$. To explore the Fourier series approximation, select a labeled signal, use the mouse to sketch one period of a signal, or use the Mouse to modify a selected signal. Specify the number of harmonics, *N*, and click "Calculate." The approximation will be shown in red. In Addition, the magnitude spectrum (a plot of $a_n$ vs. *n*) and phase spectrum (a Plot of $\Theta_n$ vs. *n*) are shown. (If the *dc*-component is negative, $a_0 < 0$, then $|a_0|$ is shown in the magnitude spectrum and an angle of $\Pi$ radians is shown in the phase spectrum.) To see a table of the coefficients, click "Table."

## The Importance of Proper Weighting Methods:

The importance of good weighting methods in information retrieval - - methods that stress the most useful features of a document or query representative - - is examined. Evidence is presented that good weighting Methods are more important than the feature selection process and it is Suggested that the two need to go hand-in-hand in order to be effective. The Paper concludes with a method for learning a good weight for a term based upon the characteristics of that term.

Other than experimental results, the first part of this chapter contains little new material. Instead, it's an attempt to demonstrate the relative importance And difficulties involved in the common information retrieval task of forming documents and query representatives and weighting features. This is the sort of thing that tendsTo get passed by word of mouth if at all and never gets published.

However, there is a tremendous revival of interest in information retrieval; Thus this attempts to helpAll those new people just starting in experimental information retrieval.

A common approach in many areas of natural language processing is to

1. Find "features" of a natural language excerpt.
2. Determine the relative importance of those features within the excerpt.
3. Submit the weighted features to some task- appropriate decision procedure.

This presentation focuses on the second sub: task above: the process of weighting features of a natural language representation. Features here could Be things like single word occurrences, phrase occurrences, other relationships between words, and occurrence of a word in a title, part-of-speech of a word, automatically or manually assigned categories of a document, citations of a document, and so on. The particular overall task addressed here is that of information retrieval - finding textual documents (from a large set of documents) those are relevant to a user's information need. Weighting features is something that many information retrieval systems seem to regard as being of minor importance as compared forfinding the features in the first place; but the experiments described here suggest that weighting is considerably more important than additional feature selection. This is not an argument that feature selection is unimportant, but that development of feature selection and methods of weighting those features need to precede hand-in-hand if there is to be hope of improving performance. There have been many papers (and innumerable unpublished negative result experiments) where authors have devoted tremendous resources and intellectual insights into finding good features to help represent a document, but then weighted those features in a haphazard fashion and ended up with little or no improvement. This makes it extremely difficult for a reader to judge the worthiness of a feature approach, especially since the weighting methods are very often not described in detail. Long term, the best weighting methods will obviously be those that can adapt weights as more information becomes available. Unfortunately, in information retrieval it is very difficult to learn anything useful from one query that will be applicable to the next. In the routing or relevance feedback environments, weights can be learned for a query and then applied to that same query. But in general there is not enough overlap in vocabulary (and uses of vocabulary) between queries to learn much about the usefulness of particular words. The second half of this chapter discusses an approach that learns the importantCharactericstics of a good term. Those characteristics can then be used to properly weight all terms.

Several sets of experiments are described, with each set using different types of information to determine the weights of features. All experiments were done with the SMART information retrieval system, most using the TREC/TIPSTER collections of documents queries, and Relevance judgments. Each run is evaluated using the "ll-point recall-precision average" evaluation method that was standard at the TREC 1 conference.

The basic SMART approach is a completely automatic indexing of the full Text of both queries and documents. Common meaningless words (like 'the' or 'about') are removed, and all remaining words are stemmed to a root form. Term weights are assigned to each unique word (or other feature) in a vector by the statistical/learningProcesses described below. The final form of a representative for a document (or query) is a vector D~ = (w~, l, w~, 2... wi, ~) where D~ represents a document (or query) text and w~, k is a term weight of term *Tk* attached to document Di. The similarity betweena query and document is set to the inner product of the query vector and document vector; the information retrieval systems as a whole will re-Turn those documents with the highest similarity to the query.

## AD-HOC WEIGHTS:

Remains that they are used because they work well, rather than anytheoretical reason. Table 1 presents the evaluation results of running a number of t f*I d f variants for query weighting against a number of variants for document weighting (the runs presented here are only a Document or query weights can be based on any number of factors; two would be statistical occurrence information and a history of how well this features (or other similar features) have performed in the past. In many situations, it's impossible to obtain history information and thus initial weights are often based purely on statistical information. A major class of statistical weighting schemes is examined below, showing that there is an enormous performance range within the class. Then the process of adding additional features to a document or query representative is examined in the Context of these weighting schemes. These are issues that are somewhat subtle and are often overlooked.

## T f * I d f Weights:

Over the past 25 years, one class of term weights has proven itself to be useful over a wide variety of collections. This is the class of t f*I d f (term frequency times inverse document frequency) weights [1, 6, 7], that assigns weight wik to term T k in document/)i in proportion to the frequency of occurrence of the term in D~, and in inverse proportion to the number of documents to which the term is assigned. The weights in the document are then normalized by the length of the document, so that long documents are not automatically favored over short documents. While there have been some post-facto theoretical justifications for some of the t f*I d f weight variants, the fact small subset of the variants actually run).

All of these runs use the same set of features (single terms), the only differences are in the term weights. The exact variants used aren't important; what is important is the range of results. Disregarding one extremely poor document weighting, the range of results is from 0.1057 to 0.2249. Thus a good choice of weights may gain a system over 100%. As points of comparison, the best official TREC run was 0.2171 (a system incorporating a very large amount of user knowledge to determine features) and the median TREC run in this category was 0.1595. The best run (DOCWT = l n c, QWT = l t c), is about 24% better than the most generally used t f*I d f run (DOCWT = QWT = n t c). 24%is a substantial difference in performance, in a field where historically an improvement of 10% is considered quite well. The magnitude of performance improvement due to considering additional features such as syntactic phrases, titles and parts of speech is generally quite small (0 - 10%). Adding features and using good weights can of course be done at the same time; but the fact that somewhat subtle differences in weighting strategy can overwhelm the effect due to additional features is worrisome. This means the experimenter must be very careful when adding features that they do not change the appropriateness of the weighting strategy.

## Adding New Features:

Suppose an experimenter has determined a good weighting strategy for a basic set of features used to describe a query or document and now wishes to extend the set of features. In the standard t f* I d f, cosine-normalized

class of weights, it is not as simple as it may first appear. The obvious first step, making sure the weights before normalization of the new set of features and the old set are commensurate, is normally straightforward. But then problems occur because of the cosine normalization. ForExample, suppose there were two documents in a collection, one of them much longer then the other:

• Di = (w1,1, wl,2, wl,3) • D2 = (w2,1,w~,2,...w2,100)
Now suppose the new approach adds a reasonably constant five features onto each document representative. (Examples of such features might be title words, or categories the document is in.) If the new features are just added on to the list of old features, and then the weights of the features are normalized by the total length of the document, then there are definite problems. Not only does the weight of the added features vary according to the length of the document (that could very well be what is wanted), but the weights of the old features have 350 changed. A query that does not take advantage of the new features will suddenly find it much more difficult to retrieve short documents like D1. D1 is now much longer than it was, and therefore the values of WL, k has all decreased because of normalization.

Similarly, if the number of new added features tends to be much more for longer documents than short (for example, a very loose definition of phrase), a query composed of only old features will tend to favor short documents more than long (at least, more than it did originally). Since the original weighting scheme was a supposedly good one, these added features will hurt performance on the original feature portion of the similarity. The similarity on the added feature portion might help, but it will be difficult to judge how much. These normalization effects can be very major effects. Using a loose definition of phrase on CACM (a smalltest collection), adding phrases in the natural fashion above will hurt performance by 12~0. However, if the phrases are added in such a way that the weights of the original single terms are not affected by normalization, then the addition of phrases improves performance by **9%.**

One standard approach when investigating the usefulness of adding features is to ensure that the weights of the old features remain unchanged throughout the investigation. In this way, the contribution of the new features can be isolated and studied separately at the similarity level. [Note

That if this is done, the addition of new features may mean the re-addition of old features, if the weights of some old features are supposed to be modified.] This is the approach we've taken, for instance with the weighting of phrases in TREC. The single term information and the phrase information are kept separate within a document vector. Each of the separate sub vectors is normalized by the length of the single term sub vector. In this way, the weights of all terms are kept commensurate with each other, and the similarity due to the original single terms is kept unchanged. The investigation of weighting strategies for additional features is not a simple task, even if separation of old features and a new feature is done. For example, JoelFagan in his excellent study of syntactic and statistical phrases [2] spent over 8 months looking at weighting strategies.
But if it's not designed into the experiment from the beginning, it will be almost impossible.

## Relevance Feedback:

One opportunity for good term weighting occurs in the routing environment. Here, a query is assumed to represent a continuing information need, and there have been a number of documents already seen for each query, some subset of which has been judged relevant. With this wealth of document features and information available, the official TREC routing run that proved to be the most effective was one that took the original query terms and assigned weights based on probability of occurrence in relevant and non-relevant documents. Once again, weighting, rather than feature selection, worked very well. (However, in this case the feature selection process did not directly adversely affect the weighting process. Instead, it was mostly the case that the additional features from relevant documents were simply not chosen or weighted optimally.) In this run, using the RPI feedback model developed.
Relevance feedback information was used for computing the feedback query term weight q~ of a term *as p~ (1 –ri)/ [ri (1 -Pi)]* - 1 Here Pi is the average document term weight for relevant documents, and ri is the corresponding factor for no relevant items. Only the terms occurring in the query was considered here, so no query expansion took place. Having derived these query term weights, the query was run against the document set. Let *di* denote the document term weight, then the similarity of a query to a document is computed by *S (q,* d) = ~] (log (qi * di + 1))

## LEARNING WEIGHTS BY TERMFEATURES:

The ad-hoc t f*I d f weights above use only collection statistics to determine weights. However, if previous queries have been run on this collection, the results from those queries can be used to determine what term weighting factors are important for this collection. The final term weight is set to a linear combination of term weight factors, where the coincident of each factor is set to minimize the squared error for the previous queries [4, 5]. The official TREC runs using this approach were nearly the top result; which was somewhat surprising given the very limited and inaccurate training information which was available. This approach to earning solves the major problem of learning in an ad-hoc environment: the fact that there is insufficient information about individual terms to learn reasonable weights. Most document terms have not occurred in previous queries, and therefore there is no evidence that can be directly applied.

Instead, the known relevance information determines the importance of features of each term. The particular features used tires 1 were combinations of the following term factor'**s f:** within-document frequency of the term 351 log I d f: log ((N + l) / n), where N is the number of documents in the collection and n is the number of documents containing the term lignum terms: log (number of different terms of the document) i m a x t f: 1 / (maximum within-document frequency of a term in the document).

After using the relevance information, the final weight for a term in a TREC 1 document was W (t,) = 0.00042293 +0.00150083 * t f* log I d f* imaxtf +-0.00150665 • t f* imaxtf +0.00010465 * log i d f +-0.00122627 * lignum terms • imaxtf.There is no reason why the choice of factors used in TREC 1 is optimal; slight variations had been used forum earlier experimentationisprogressingon the choice of factors, especially when dealing with both single terms and phrases. However, even so, the TREC 1 evaluation results were very good. If the minimal learning information used by this approach is available, the results suggest it should be preferred to the ad-hoc weighting schemes discussed earlier.

Tile sets of experiments described above focus on feature weighting and emphasize that feature weighting seems to be more important than feature selection. This is not to say that good feature selection is not needed for optimal performance, but these experiments suggest that good weighting is of equal importance. Feature selection is sexy and weighting isn't, but optimal performance seems to demand that weighting schemes and feature selection need to be developed simultaneously. Weighted sum of FS approximations variablesA statistic involving a weighted sum of random variables **is** frequently used in Statistical inference. **When** independence between the random variables **is** a reasonable assumption, weighted **sums** have **several** desirable properties. For instance, calculations of distribution characteristics **[e.g.,** i h t and second order moments, various generating functions) **wiU** be greatly **simple Med** if independence of the variables in the **sum** may be assumed. The **key** statistical functional that w i l I be explored in detail in the **next** chapter is linear combinations of independent random variables.

## (1.10) PARAMETRE ESTIMATION – W F S A:

New morph metric frame work called the weighted Fourier series representation through approximation. The WFS is both a global high hierarchical parameterization and explicit data smoothing techniques formulated as a Fourier series approximation. WFS approximation generalized the traditional spherical harmonic representation with additional exponential weights.

Unlike spherical harmonic, WFS approximation can be formulated as Kernel smoothing when the self ad joint operator becomes the Lap lace Beltrami Operator. The Similar Kernel smoothing, the random field theory can be used for statistical inference on localizing abnormal shape variation in a clinical population. Many basic theoretical properties of WFS approximation and its numerical implementation issues are considered in great depth. WFS approximation and its umbilical implementation issues are considered in great depth. WFS approximation requires estimating good numbers of unknown Fourier coefficients on a high resolution sample. This requires a specialized linear solver with fairly steep computational resources.

To address this issue, we have to develop a new estimator technique called the iterative residual fitting algorithm. The correctness of the algorithm will be proved and its accuracy is numerically evaluated.

The development of the underlying theory of the WFS approximation and its numerical implementation using the irruptive residual fitting algorithm. In following details, I will review the literature that is directly related to research methodology and address what specific hypothesis are in the context of the previous literature.

Smoothing process weighted Fourier series Approximation.

I will investigate the properties of the finite expansion of linear operator L,

$$g(p,t)=\sum_{i=0}^{\infty} e^{-\lambda_i t}\langle f,\psi_i\rangle\psi_i(P) \quad \text{Denoted by}$$

$$F_t^k(f)_{(p)}=\sum_{j=0}^{k} e^{-\lambda_j t}\langle f,\psi_j\rangle\psi_j(P).$$

The expansion will be called as the weighted Fourier series approximation. By rearranging the inner product, the WFS approximation can be rewritten as kernel smoothing

$$\begin{aligned} F_t^k(f)_{(p)} &= \sum_{j=0}^{k} e^{-\lambda_j t}\psi_j(P)\int_{S^2} f(q)\psi_j(q)d_w(q) \\ &= \int_{S^2} f(q)K_t^k(p,q)d_w(q). \end{aligned}$$

Various theorems developed and tested.

Numerical implementation- In constructing WFS approximation, aii I need is essential Fourier coefficients. There are three major techniques for computing the Fourier coefficients.

Normal equation in statistical literatures,

$$f(P_i)=\sum_{l=0}^{k}\sum_{m=-1}^{l} B_{lm}Y_{lm}(P_i) \quad all \;\; 1\le i\le n$$

The normal equation usually solved via a matrix inversion.

## Rationale:

In 1822, the French mathematician J.B. Fourier, Showed that any arbitrary periodic function could be represented by an infinite sum of sinusoids of harmonically related frequencies in terms of series , Several words in this sentence need clarification at this point. A continuous function f(t) is said to be periodic with period T if f(t) = f (t +T) for any T. Of special interest to us are the sinusoids

$$f_1(t) = \cos\left(\frac{2\pi n}{T}\ t\right) = \cos\ n\ w_0\ t$$

$$and\quad f_2(t) = \sin\left(\frac{2\pi n}{T}\ t\right) = \sin\ n\ w_0\ t$$

Where n is any integer (or Zero). Each frequency of the sinusoids $n\ w_0 = \frac{2\pi n}{T}$ is said to be the nth harmonic of the fundamental w thus a periodic wave will be described in terms of its fundamental frequency, its second harmonic, third harmonic etc. Where each of these frequencies is simply related to the period T. Note that the fundamental frequency and period are related as follows: $w_0 = 2\pi f_0 = \frac{2\pi}{T}$

Where $f_0$ is the fundamental frequency in cycles per second or $H_Z$, $w_0$ is the fundamental frequency in radians per second (rad/s), and T is the period in seconds per cycle.

A square wave can be built up from a sum of harmonically related sine waves. The sum begins to approach a square wave as more terms are

added. Higher frequency is needed to reproduce the sharp corners of the square wave will be derived below:

If f (t) is periodic, the Fourier series is

$$f(t) = a_0 + a_1 \cos\ w_0 t + a_2 \cos\ 2w_0 t + \ldots a_n \cos\ n\ w_0 t + b_1 \sin w_0 t + \ldots + b_n \sin n w_0 t$$

The series can be written in a number of equivalent forms, one of which is obtained by recognizing that for all n.

$$a_n \cos\ n\ w_0 t + b_1 \sin w_0 t = C_n \cos\ \left(n\ w_0 t + \theta_n\right)$$

Where $C_n = \sqrt{a_n{}^2 + b_n{}^2}\, and\, \theta_n = \tan^{-1} \dfrac{b_n}{a_n}$

Combining pairs of terms gives the equivalent from of the Fourier series, U (p) to every point, so that,

$$u(t, p) = R_e \left[ \mathrm{U(p)} e^{2\pi i f_t} \right]$$

We need a preliminary result, show a ray directed along an arbitrary axis $\mathrm{OO}_Z$. The disturbance is given by

$$u(t, Z) = a \cos\left[ 2\pi \left( \frac{t}{T} - \frac{z}{\lambda} \right) + \phi \right]$$

Where, $T, \lambda\ \ and\ \ \phi$ are the period, wave length, and a constant phase angle, and the wave velocity $v = \lambda / T$ is directed towards the right.

Let Q and P be arbitrary fixed points on $O_Z$.

In an obvious notation

$$u_\phi\left(t, Z_Q\right) = a\cos\left[2\pi\left(\frac{t}{T} - \frac{Z_Q}{\lambda}\right) + \phi\right]$$

$$u_\phi\left(t, Z_P\right) = a\cos\left[2\pi\left(\frac{t}{T} - \frac{Z_p}{\lambda}\right) + \phi\right]$$

The corresponding pharos or complex amplitudes at Q and P are $U_Q$ ,$U_P$ given by

$$U_Q = a e^{i\left[\phi - \left(2\pi Z_Q/\lambda\right)\right]} = a e^{i\phi_Q},$$

$$U_P = a e^{i\left[\phi - \left(2\pi Z_P/\lambda\right)\right]} = a e^{i\phi_P}$$

The out -of-step behavior of the oscillations at Q and P is defined by the phase difference

$$\phi_{QP} = \phi_P - \phi_Q = -2\pi\left(Z_P - Z_Q\right)/\lambda$$

Phase change $\phi_{QP}$ along the ray QP

If $-\frac{1}{2}h \le x \le \frac{1}{2}h$ $and$ $\frac{h^2}{r} \square\ 8\lambda$ then

$\phi_{QP} = -2\pi\left(r + x\sin\theta\right)\lambda$ With an error << $2\pi(radians)$

Note that the approximation to $\phi_{QP}$ is linear

$$f(t) = C_0 + C_1 Cos\left(w_0 t + \theta_1\right) + ..... +_n Cos\left(n w_0 t + \theta_n\right) + ....$$

$C_0 = a_0$ And all other $C_n and \ \theta_n$ defined earlier.

Additionally: for a continuous time, T periodic signal X (t), the N-harmonic Fourier series approximation can be written as

$$x(t) = a_0 + a_1 Cos\left(w_0 t + \theta_1\right) + a_2 Cos\left(2w_0 t + \theta_2\right) + \ldots\ldots + a_N Cos\left(Nw_0 t + \theta_N\right)$$

Where the fundamental frequency $w_0$ is $\frac{2\pi}{T}$ rad /sec, the amplitude coefficients $a_{1,\ldots\ldots\ldots\ldots,} a_N$ are non-negative, and the radian phase angles satisfy $0 \leq \theta_{1,\ldots\ldots\ldots\ldots\ldots,} \theta_N < 2\pi$

Under diffraction from a uniformly radiating strip; consider the half-space $Z \geq 0$, crises-crossed by traveling waves all having the same frequency f and wave-length $\lambda$. At every point P there is a disturbance u (t, p) produced by superposition of all the rays passing through P, and interference between rays determines the resultant amplitude and phase of the oscillation at P. Instead of using u (t, p), we shall assign a pharos, or complex amplitude in $X \sin \theta$.

Various consideration of Fourier series concepts like periodic functions, coefficients, functions of finite range spectrum. Sine and cosine transforms, exponential expressions, other scientific function will be tested for Fourier series approximation.

# (1.11) BIOMEDICAL ALGORITHM:

The volume of biomedical text is growing at a fast rate, creating challenges for humans and Computer systems alike. One of these challenges arises from the frequent use of novel abbreviations in these texts, thus requiring that biomedical lexical ontologies be continually Updated. We show that the problem of identifying abbreviations' definitions can be solved with a much simpler algorithm than that proposed by other research efforts.The Algorithm achieves 96% precision and 82% recall on a standard testCollection, which is at least As good as existing approaches. It also achieves 95% precision and 82% recall on another, larger test set. A notable advantage of the algorithm is that, unlike other approaches, it does not require any training data.

There has been an increased interest recently in techniques to automatically extract Information from biomedical text, and particularly from MEDLINE the size and growth rate of biomedical literature creates new challenges for Researchers who need to keep up to date. One specific issue is the high rate at which new abbreviations are introduced in biomedical texts. Existing databases, ontologies, and ictionaries must be continually updated with new abbreviations and their definitions. In an attempt to help resolve the problem, new techniques have been introduced to automatically extract abbreviations and their definitions From MEDLINE abstracts.

we propose a new, simple, fast algorithm for extraction of Abbreviations from biomedical text. The scope of the task addressed here is the same as the one described in Pustejovsky et al.:14 identify <"short form", "long Form"> pairs where there exists a mapping (of any kind) from characters in the short Form to characters in the long form.

We use the terms "short form" and "long form" interchangeably with "Abbreviation" and "definition". We also use the term "short form" to indicate both abbreviations and Acronyms, conflating these as have previous authors.

Many abbreviations in biomedical text follow a predictable pattern, in which the first letter of each word in the long form corresponds to one letter in the short Form, as in *methyl methanesulfonate sulfate (MMS)*.

However, there are many cases in which the correct match between the short form and long form requires words in The long form to be skipped or matching of internal letters in long formwords, as in *Gcn5-related N-*

*acetyltransferase (GNAT.*we describe a very simple, Fast algorithm for this problem that achieves both high recall and high precision.

## Related Works:

Pustejovsky et al.13, 14 present a solution for identifying abbreviations based on hand-built regular expressions and syntactic information to identify boundaries of Noun phrases. When a noun phrase is found to precede a short form enclosed in parentheses, each of the characters within the short form is matched in the long Form. A score is assigned that corresponds to the number of non-stopwords in the long form divided by the number of characters in the short form. If the result is below a threshold of 1.5, then the match is accepted. This algorithm achieved 72% Recall and 98% on "the gold standard," a small, publicly available evaluation corpus that this group created, working better than a similar algorithm that does not take Syntax into account b Pustejovsky et al.13 also summarize some drawbacks of other earlier pattern based approaches, noting that the results of Taghva et al.17 look good (98% precision and 93% recall on a different test set), but do not account for abbreviations whose letters may correspond to a character internal to a definition Word, a common occurrence in biomedical text. They also find that the Acrophile Algorithm of Larkey ET al.8 does not perform well on the gold standard. Chang ET al.5 presents an algorithm that uses linear regression on a pre-Selected Set of features, achieving 80% precision at a recall level of 83%, and 95% precision at 75% recall on the same evaluation collection (this increases to 82% recall and 99% precision on a corrected version).c their algorithm uses dynamic programming to find potential alignments between short and long form, and uses the results of this to compute feature vectors for correctly identified definitions. They then use binary Logistic regression to train a classifier on 1000 candidate pairs.

Yeates ET al.19 examines acronyms in technical text. They address a more Difficult problem than some other groups in that their test set includes instances that do not have distinct orthographic markers such as Parentheses to indicate the B There is some errors in the gold standard. The results reported by Pustejovsky ET al.13 is on a Variation of the gold standard with some Corrections, but the actual corrections made are not reported in Unfortunately, the corrections needed on the standard are not

Standardized. C Personal communication. Proximity of a definition to an abbreviation (they report that only two thirds of the Examples take this form). Their algorithm creates a code that indicates the distance of the definition words from the corresponding characters in the acronym, and uses Compression to learn the associations. They compile a large estcollectionConsisting of 1080 definitions; training on two thirds and testing on the remainder, reporting the results on a Precision/recall curve. Park and Byrd12 present a rule-based algorithm for extraction of abbreviation Definitions from general text. The algorithm creates rules on the fly that model how the short form can be translated into the long form. They create a set of five Translation rules, a set of five rules for determining candidate long forms based on their length and a set of six heuristics for determining which definition to choose if there are many potential candidates. These are: syntactic cues, rule priority, distance between definition and abbreviation, capitalization criteria, number of words in the Definition and number of stop words in the definition. Rule priority is based on how often the rule has been applied in the past. They evaluate their algorithm on 177 abbreviations taken from engineering texts, achieving 98% precision and 95% Recall. No mention is made of the size and nature of the training set or whether it was distinct from the test set.

Yu ET al.21 presents another rule-based algorithm for mapping abbreviations to their full forms in biomedical text. Their algorithm is similar to that of Park and Byrd. For a given short form, the algorithm extracts all the candidate long forms that start with the same character as the short form. The algorithm then tries to match the candidate long forms to the short form starting from the shortest long Form, by iteratively applying 5 pattern-matching rules. The rules include heuristics such as prioritizing matching the first character of a word, allowing the use of internal letters only if the first letter of a word was matched, and so on. The algorithm was evaluated on a Small collection of biomedical text containing 62 Matching pairs, achieving 95% precision and 70% recall on average.Adar2 presents an algorithm that generates a set of paths through the window of text adjacent to an bbreviation (starting from the leftmost character), and scores these paths to find the most likely definition. Scoring rules used include “for every Abbreviation character that occurs at the start of a definition word, add 1”, and “A bonus point is awarded for definitions those are

Immediately adjacent to the Parenthesis". After processing a large set of abbreviation-definition pairs, the results are clustered in order to identify spelling variants among the definitions. N-gram clustering is coupled with lookup into the Mesh hierarchy to further improve the Clusters. Performance on a smaller subset of the gold standard yielded 85% recall and 94% precision; the author notes that 2 definitions identified by his algorithm Should have been marked correct in the standard, resulting in a precision of 95%.d D Results verified through personal communication with the author.

The work described in this paper arose because the authors found difficulties making the Park and Byrd algorithm work well on biomedical text. The rules it produces are very specific to the format of candidate abbreviations, and so many Abbreviations were being represented by patterns that had not yet been ncountered by the algorithm, and thus rule priority was not often applicable. The approach closest to the one we present here is the algorithm of Yoshida et Al.20 their algorithm assumes that the definition or the abbreviation occurs adjacent to parentheses, but their paper does not state how the length of candidate definitions Is determined. Their algorithm scans words from the end of the abbreviation and Candidate definition to the beginning, trying at each iteration to find a match for the Substring of the abbreviation in the definition. The algorithm assumes that in order For a character from the bbreviation to be represented in the interior of a word in the definition, there must be a match of some other character from the abbreviationOn the first letter of that word. In addition, characters that matches in the interior of the word must either be adjacent to one another following that initial letter, or Adjacent to one another following a syllable boundary. Each iteration of thealgorithm requires a check to see if a subsequence can be properly formed According to these rules. They test this algorithm on a very large collection (They had an independent assessor evaluate more that 15,000 categorizations), achieving 97.5% precision and 95.5% recall. Another important processing issue for abbreviations is disambiguation of multiple senses of the same short form. Pustejovsky et al.13 describe an algorithm that yields abbreviation sense disambiguation accuracies of 98%, and Pakhomov9 Achieves accuracies of 89% on clinical records. Yet another issue is normalization of different spellings of the same Abbreviation. It is difficult to define what it means for two biomedical terms to refer to the same concept; Cohen ET al.6 provides one set of rules.

## Methods and Implementation:

*Identifying Short Form and Long Form Candidates*
The process of extracting abbreviations and their definitions frommedical text is composed of two main tasks. The first is the extraction of <short-form, long-form> Pair candidates from the text. The second task is identifying the correct long form from among the candidates in the Sentence that surrounds the short form. Most approaches, including the one presented here, use a similar method for finding Candidate pairs.

Abbreviation candidates are determined by adjacency to Parentheses.
The two cases are:
1) Long form '('short form ')' and (ii) Short form '('long form ') In practice, most <short form, long form> pairs conform to pattern (i). whenever the expression inside the parentheses includes more than two words, pattern (ii) is assumed, and a short form is searched for just before the left Parenthesis (word boundaries are indicated by spaces). Short forms are considered valid candidates only if they consist of at most two words, their length is between two to ten characters, at least one of these characters is a letter, and the first Character is alphanumeric. For simplicity, pattern (i) is assumed in the discussion below.
The next step is to identify candidates for the long form. The long form candidate must appear in the same sentence as the short form,and as in Park and Byrd12, it should have no more than min (|A| + 5, |A| * 2) Words, where |A| is the Number of characters in the short form. Although the algorithm of Park and Byrd allows for an offset between the short and long forms, we consider only long forms that are adjacent to the short form. For a given short form, a long form candidate is composed of contiguous words from the original text that include the word just before the short form.

## Algorithm for Identifying Correct Long Forms:

When the previous steps are completed there is a list of long formcandidate wordsfor the short form, and the task is to choose the right subset of words. Figure 1Presents the code that performs this task. The main idea is: starting from the end of both the short form and the long form, move right to left, trying find the shortest Long form that matches the short

form. Every character in the short form must match a character in the long form and the matched characters in the long form must be in the same order as the characters in the short form. Any character in the long form can match a character in the short form, with one exception: the match of the character at the beginning of the short form must match a character in the initial Position of the first (leftmost) word in the long form (this initial position can be the first letter of a word that is connected to other words by hyphens and other nonalphanumeric Characters).
The implementation in Figure 1 uses two indices, *lIndex* for the long form, and *SIndex* for the short form. The two indices are initialized to point to the end of their Respective strings. For each character *sIndex* points to, *lIndex* is decremented until a Matching character is found. If lIndex reaches the beginning of the long form candidate list before sIndex does, the algorithm returns null (no match found).

## An Alternative Algorithm:

When we began to investigate the problem of abbreviation definitionidentification, we devised a much more complex algorithm than that presented here. This Algorithm uses the representation of Park and Byrd12 in combination with a variation on the decision lists algorithm, as applied by Yarowsky18 to the lexical ambiguity Resolution task. The algorithm makes use of training data to rank features that are Combinations of matching rule transformations.space restrictions prevent detailed description of that algorithm (the interested reader should refer to Schwartz and Hearst16 for a complete description of the Algorithm).
However, we found that it performed mildly better than our simple Algorithm on both training sets, achieving for the gold standard 97% precision and 82% recall, which is a reduction in error of 17% over the simpler algorithm. For the larger test collection, it achieves 96% precision and 82% recall, which is an error Reduction of 22% over the simpler algorithm.

The dataset was originally annotated by a graduate student in computational and biosciences. WeFurthered verified the data by comparing any questionable pairs against other occurrences of the SameAbbreviation in other abstracts, using the web site provided by Chang

ET al.5 a pair extracted by the Algorithm is considered correct only if it exactly matches a pair labeled in the dataset.
Because the simple algorithm is so much easier to implement and requires no training data, we recommend its use, in combination with checking

The entire Data set for redundancy in definitions in order to further reduce the error rates.

We introduced a new algorithm for extracting abbreviations and their Definitions from biomedical text. Although the algorithm is extremelysimple, it is highly effective, and is less specific – and therefore less potentially brittle – than other approaches that use carefully crafted rules.

Although we are staunch advocates of machine learning approaches for problems in computational linguistics, it seems that in the case of this particular problem, simpler is better. One can argue that the problem may vary across collections or languages, and so machine learning can help in these cases, but our experience with a machine learning approach to Sentence boundary determination11 suggests that most practitioners do not want to bother with labeling training data for relatively simple tasks.

Another advantage of the simplicity of the algorithm is its fast running time Performance. The task of extracting the definition of an abbreviation, is a common pre-processing step of larger multi-layered text-mining tasks.1, 10 Therefore, it is essential that this step be as efficient as possible. Since our algorithm needs toconsider only one possible long form per short form, it is much faster than the Alternative algorithms that first extracts many possible long forms and then pick the Best of them. To provide a rough comparison, using an IBM T21 laptop with a Single CPU (800 MHz, 256 Mb RAM) running MS-Windows 2000, it takes our Algorithm about 1 second to process 1000 abstracts, while the algorithm in Chang et al.5 using a 5 Processor Sun Enterprise E3500 server, processed only 25.5 abstracts Per second. While our algorithm is clearly I/O bound (running time depends almost entirely on the time it takes to read the files from disk, and write the results back to the disk), the algorithms of Chang et al. seem to be heavily CPU bound. The algorithm performs better or the same as the best results of other work, with the possible exception of that of Yoshida et al.20 However, the main advantage of the proposed algorithm over the alternatives are its simplicity, and transparency. It was implemented with 260 lines of Java code and requires no training data to run.

The Yoshida et al. Algorithm is more complex, in that it requires a module for Recognizing syllable boundaries, and it performs a substring check at each iteration of the loop. Analysis of the errors produced indicates that further improvement of the Algorithm requires the use of Syntactic information, as suggested in Pustejovsky et al.13 shallow parsing Of the text as a preprocessing step might help correct some of the errorsInherent in the algorithm, by helping to identify the noun phrases near the Abbreviations. In addition, combining evidence from more than one MEDLINE abstract at a time, as was done in Adar2, might also prove to be beneficial for Increasing both precision and recall. Finally, the algorithm currently only considers candidate definitions when the abbreviation is enclosed in parentheses (and vice Versa); finding all possible pairs is a more difficult problem and requires additional Study.

## (1.12) ORGANISATION OF THESIS:

**Chapter 1** Deals with Introduction of a biomedical statistics, biomedical statistical inference, importance of biomedical statistics,use of biostatistics,application of biostatistics,fourier series, weighted fourier series,weighted fourier series approximation,parameter estimations-WFSA and Algorithm.

**Chapter 2** Discuss Literature review of a fourier series.

**In Chapter 3** Research Methodology is presented.

**In Chapter 4** Objectives and hypothesis of study are discussed.

**Chapter 5** Includes Data analysis and Description by using frequence table, t-test, f-test Chi-Square t-test and logestics regression.

**Chapter 6** Discusses concluding remark and future prospects

**Chapter 7** presents some case study of a cancer like Brest cancer, survival cancer, lung cancer etc.

# CHAPTER 2

# Literature review

# CHAPTER 2 LITERATURE REVIEW:

## Literature review:

Over the last few decades there has been a dramatic surge in the number of published Articles that show different ways of implernenting exact methods for a variety of Applications **(March,** 1972; Baker, 1977; Mehta and Patel, 1980, 1983; Hajj et **al,** 1987; Pagans and Twitchier, 1983; snitcher, 1984). The different approaches that Appeared in the literature fail in one of the following three categories:

- Exhaustive enumerations (e-g. **March,** 1972) Graph-theory basics network algorithm (e-g. Hajji et al., 1987) Recurrence relations **and** Fourier transform **(e.g.** tetchier, **1984).**

Two comprehensive sunray papers on exact methods and available algorithm for computing exact payees are due to **A m (1992)** and Verbreek and Rotenberg **(1985).** A recent book titled 'Exact Statistical Methods for Data Analysis' (Weerahandi, **1995)** shows various **uses** methods for exact inference with an emphasis on Normal theory methods **such** as **ANOVA** and regression.

Weerahandi **(1995)** notes that the methods describes in his book are exact in the **sense** that the tests and confidence intimae's are based on exact probability Statements rather than on asymptotic approximations. Inferences based on this Approach can be made with any **desired accuracy,** provided that assumed parametricmode1 and/or other assumptions are correct. Exact methods are also widely **used** in nonparametric settings. These methods provide **exact** values **instead** of approximate fixed-Ivied tests. Most of the exact Nonpararnetric techniques **are** based on the idea of conditional inference first intru-Duced by Fisher **(1925).** The basic principle behind **this** approach **is** to alginate Nuisance parameters from the inference problem by conditioning on certain functions of the observable random variables.

In most cases, sufficient statistics are **used** as conditioning functions. **Exact Values** are obtained **as** conditional probabilities based on extreme regions and they **serve** as a measure of how w d the data supports or demerits the underlying.

History And Literature Of The Theory The history of the theory of the representation of functions by series of sines and cosines is of great interest in connexion with the progressive development of the notion of an arbitrary function of a real variable, and of the peculiarities which such a function may possess; the modern views on the foundations of the infinitesimal calculus have been to a very considerable extent formed in this connexion (see Function). The representation of functions by these series was first considered in the, 8th century, in connexion with the problem of a vibrating cord, and led to a controversy as to the possibility of such expansions. In a memoir published in 1747 (*Memoirs of the Academy of Berlin,* vol. iii.) D'Alembert showed that the ordinate *y* at any time *t* of a vibrating cord satisfies a differential equation of the form 621,i = a 2 Sx, where *x* is measured along the undisturbed length of the cord, and that with the ends of the cord of length *l* fixed, the appropriate solution is *y = f (at+x) -f (at-x),* where *f* is a function such that *f(x) = f (x+21);* in another memoir in the same volume he seeks for functions which satisfy this condition. In the year 1748 (*Berlin Memoirs,* vol. IV.) Euler, in discussing the problem, gave *f(x)* = a sin *l* + (3 sin 2 l xx +... as a particular solution, and maintained that every curve, whether regular or irregular, must be represent able in this form. This was objected to by D'Alembert (, 750) and also by Lagrange on the ground that irregular curves are inadmissible. D. Bernoulli (*Berlin Memoirs,* vol. ix, 1753) based a similar result to that of Euler on physical intuition; his method was criticized by Euler (1753). The question was then considered from a new point of view by Lagrange, in a memoir on the nature and propagation of sound (*Miscellanea Taurensia,* 1759; (*Euvres,* vol. i.), who, while criticizing Euler's method, considers a finite number of vibrating particles, and then makes the number of them infinite; he did not, however, quite fully carry out the determination of the coefficients in Bernoulli's Series. These mathematicians were hampered by the narrow conception of a function, in which it is regarded as necessarily continuous; a discontinuous function was considered only as a succession of several different functions. Thus the possibility of the expansion of a broken function was not generally admitted. The first cases in which rational functions are expressed in sines and cosines were given by Euler (*Subsidium calculi sinuum,* Novi Comm. Petrop., vol. v., 1754-1755), who obtained the formulae 2¢ =sin ¢-2 sin 2¢+4 sin 30...

12 4 =cos ¢-4 cos 2¢+1 cos 3¢....

In a memoir presented to the Academy of St Petersburg in 1777, but not published until 1798: Euler gave the method afterwards used by Fourier, of determining the coefficients in the expansions; he remarked that if is expansible in the form A+B cos ¢+C cos 2¢+..., then A = 7 *d¢,* B =- f ir 4, cos *¢d¢,* &c. ir The second period in the development of the theory commenced in 1807, when Fourier communicated his first memoir on the Theory of Heat to the French Academy. His exposition of the present theory is contained in a memoir sent to the Academy in, 81, of which his great treatise the *Theories analytique de la chaleur,* published in 1822, is, in the main, a reproduction. Fourier set himself to consider the representation of a function given graphically, and was the first fully to grasp the idea that a single function may consist of detached portions given arbitrarily by a graph. He had an accurate conception of the convergence of a series, and although he did not give a formally complete proof that a function with discontinuities is represent able by the series, he indicated in particular cases the method of procedure afterwards carried out by Dirichlet. As an exposition of principles, Fourier's work is still worthy of careful perusal by all students of the subject. Poisson's treatment of the subject, which has been adopted in English, works (see the *Journal de l'ecole polytechnique,* vol. xi. 1820, and vol. Xii, 1823, and also his treatise, *Theories de la chaleur,* 1835), 2 depends upon the equality f W *f (a*) 1-2h cos (x-a) +h'da J r = r *f (a) da* +? h n f? *f (a*) cos?

Where o < *h*< I; the limit of the integral on the left-hand side is evaluated when *h*= i, and found to be 2 {f (x+o) +f (x -o)}, the series on the right-hand side becoming Fourier's Series. The equality of the two limits is then inferred. If the series is assumed to be convergent when *h=i,* by a theorem of Abel's its sum is continuous with the sum for values of *h* less than unity, but a proof of the convergences for *h*= I is requisite for the validity of Poisson's proof; as Poisson gave no such proof of convergences, his proof of the general theorem cannot be accepted. The deficiency cannot be removed except by a process of the same nature as that afterwards applied by Dirichlet. The definite integral has been carefully studied by Schwarz (see two memoirs in his collected works on the integration of the equation Sx +b *y* z=0), whoshowed that the limiting value of the integral depends upon the manner in which the limit is approached. Investigations of Fourier's Series were also given by Cauchy (see his " Memoire sur les developpements des functions en series periodiques," *Mem. de l'Inst.,* vol. vi., also *Ouvres completes,* vol. vii.); his method, which depends upon a

use of complex variables, was accepted, with some modification, as valid by Riemann, but one at least of his proofs is no longer regarded as satisfactory. The first completely satisfactory investigation is due to Dirichlet; his first memoir appeared in *Crelle's Journal* for 1829, and the second, which is a model of clearness, in Dove's *Repertorium der Physik.* Dirichlet laid down certain definite sufficient conditions in regard to the nature of a function which is expansible, and found under these conditions the limiting value of the sum of n terms of the series. Dirichlet's determination of the sum of the series at a point of discontinuity has been criticized by Schlafli (see *Crelle's Journal,* vol. lxxii.) and by **Du** Bois-Reymond (*Mathem. Annalen,* vol. vii.), who maintained that the sum is really 7r sin n sin nt *f i (x) cos nxdx= f i* (-, r+0) n +f l (r-0) *n* indeterminate. Their objection appears, however, to rest upon a misapprehension as to the meaning of the sum of the series; if *x i* be the point of discontinuity, it is possible to make *x* approach xi, and n become indefinitely great, so that the sum of the series takes any assigned value in a certain interval, whereas we ought to make ***x*= x** i first and afterwards n = oo, and no other way of going to the double limit is really admissible. Other papers by Dircksen (*Crelle,* vol. iv.) and Bessel (*Astronomische Nachrichten,* vol. xvi.), on similar lines to those by Dirichlet, are of inferior importance. Many of the investigations subsequent to Dirichlet's have the object of freeing a function from some of the restrictions which were imposed upon it in Dirichlet's proof, but no complete set of necessary and sufficient conditions as to the nature of the function has been obtained. Lipschitz (" De explicatione per series trigonometric as," *Crelle's Journal,* vol. lxiii., 1864) showed that, under a certain condition, a function which has an infinite number of maxima and minima in the neighborhood of a point is still expansible; his condition is that at the point of discontinuity /3, I *f (a+ a) - f (a) I* < Baa as a converges to zero, B being a constant, and a a positive exponent. A somewhat wider condition is f (1 3-1-5) - AO)} log a= o, = *o* for which Lipschitz's results would hold. This last condition is adopted by Dini in his treatise (*Sopra la serie di Fourier,* &c., Pisa, 1880).

The modern period in the theory was inaugurated by the publication by Riemann in 1867 of his very important memoir, written in 1854, *Uber die Darstellbarkeit einer Function durch sine trigonometric Rehire.* The first part of his memoir contains a historical account of the work of previous investigators; in the second part there is a discussion of the foundations of the Integral Calculus, and the third part is mainly devoted to

a discussion of what can be inferred as to the nature of a function respecting the changes in its value for a continuous change in the variable, if the function is capable of representation by a trigonometrically series. Dirichlet and probably Riemann thought that all continuous functions were everywhere represent able by the series; this view was refuted by Du Bois-Reymond (*Abh. der Bayer. Aced.* Vol. xii. 2). It was shown by Riemann that the convergence or non-convergence of the series at a particular point x depends only upon the nature of the function in an arbitrarily small neighborhood of the point x. The first to call attention to the importance of the theory of uniform convergence of series in connexion with Fourier's Series was Stokes, in his memoir On the Critical Values of the Sums of Periodic Series "(*Camb. Phil. Trans.,* 1847; *Collected Papers,* vol. i.). As the method of determining the coefficients in a trigonometrically series is invalid unless the series converges in general uniformly, the question arose whether series with coefficients other than those of Fourier exist which represent arbitrary functions. Heine showed (*Crelle's Journal,* vol. lxxi., 1870, and in his treatise *Kugelfunctionen,* vol. i.) that Fourier's Series is in general uniformly convergent, and that if there is a uniformly convergent series which represents a function, it is the only one of the kind. G. Cantor then showed (*Crelle's Journal,* vols. lxxii. lxxiii.) that even if uniform convergence be not demanded, there can be but one convergent expansion for a function, and that it is that of Fourier. In the *Math. Ann.* vol. v., Cantor extended his investigation to functions having an infinite number of discontinuities. Important contributions to the theory of the series have been published by Du Bois-Reymond (*Abh. der Bayer. Academia,* vol. xii. 1875, two memoirs, also in *Crelle's Journal,* vols. lxxiv. Lxxvi. lxxix.), by Kronecker (*Berliner Berichte,* 1885), by O. Holder (*Berliner Berichte,* 1885), by Jordan (*Comptes rendus,* 1881, vol. xcii.), by Ascoli (*Math. Annal,* 1873, and *Annali di matematica,* vol. vi.), and by Gnocchi (*Atti della R. Acc. di Torino,* vol. x., 1875). Hamilton's memoir on "Fluctuating Functions " (*Trans. R.I.A.,* vol. xix., 1842) may also be studied with profit in this connexion. A memoir by Broden (*Math. Annalen,* vol. lii.) Contains a good investigation of some of the most recent results on the subject. The scope of Fourier's Series has been extended by Lebesgue, who introduced a conception of integration wider than that due to Riemann. Lebesgue's work on Fourier's Series will be found in his treatise, *Lecons sur les series trigonometriques* (1906); also in a memoir, "Sur les series trigonometriques," *Annales sc. de l'ecole normale superieure,* series ii. Vol.

xx. (1903), and in a chapter " Sur la convergence des series de Fourier," *Math. Annalen,* vol. lxiv. (1905).

# CHAPTER 3

# Research Methodology

# CHAPTER 3 RESEARCH METHODOLOGY:

## ➢ Using Statistics:

Once we have found relevant statistics, it is important to consider the following ideas. In order to get complete information on the methods used in compiling statistics, it is often necessary to go to the original source, rather than use information quoted elsewhere.

## ➢ *Reliability of Source:*

It is important to know what group actually gathered the data you are going to use and why they did so. This is of particular concern when considering international statistics. It is also important to know what methods were used to gather the information you are using. One example of a problem in this area is if the survey was a written one in areas where much of the studied population cannot read or write. When comparing data gathered by multiple groups, it is also important to consider the differences in the study methodologies

## ➢ Time:

Time is one of the chief variables in considering statistics. Even data gathered in a single year can be misleading. For example, if a nationwide study was done comparing the level of stress-related disorders on a state-by-state basis, it is likely that states surveyed after September 11, 2001 would show a higher incidence than they would have earlier in the year, even though all of the figures are from the same year. Also important to consider when data is presented for a year is whether that is a calendar year or a fiscal year. School years, for example, often go from summer to summer.

## ➢ Geographic Location:

Another consideration is what geographic area the statistics you are using cover. This is of particular importance when comparing statistics that have been gathered in different studies. In the United States, one of the biggest differences is whether information has been gathered on the census tract or

zip code level. These areas rarely match up exactly, making it extremely difficult to relate data gathered in one way to data gathered in another.

- **Population:**

Try to get as specific a definition of the social group covered as possible. Even such seemingly simple concepts such as "adults in area x" can be deceptive. Does "adults" include individuals over 18? Over 21? In many parts of the world this age can go as low as 15, or even 12. Comparing numbers from a study that includes anyone over 15 an adult to a study that considers anyone over 18 an adult can result in serious discrepancies.

The importance of statistics in biomedical research, explaining examples of several different ways in which medical statistics might help: sample size and power calculations, questionnaires, choice of sample and control subjects, study design, data display, and choice of summary statistics and statistical analysis.

The basics of every good clinical research – "Design". This explains the enormous importance of defining the objectives of a study first, before actually starting with the study itself. After that, various types of clinical studies are observed in detail, including their advantages and limitations. It is worth mentioning that methodological studies are also reviewed – reference ranges, method comparison studies, and studies of diagnostic tests. Controlled trials in single subjects, dose-response studies, and mixed studies are briefly mentioned. The questionnaire and form design, seldom found in biomedical statistical manuals, has been required to understand in length. The most important advice to those planning a questionnaire is look for an already existing one and iate guidelines for writing a protocol of the randomized controlled trial as well as the checklists for the design, analysis and reporting of trials. Another concept deals with "Designed Observational Studies", particularly with two main types of those studies: the cohort study and the case control study. This is actually focused on different summary statistics used to describe the outcomes of those studies. The "Common Pitfalls in Medical Statistics" is my favorite. Although, virtually all biostatistician manuals point out some mistause it, because making a good questionnaire is a time consuming and labor- intensive job. The last few sections of the chapter are dedicated to the methods of randomization and give practical tips on different randomization protocols.
The concept of probability in the context of clinical tests, two major parameters of diagnostic tests – sensitivity and specificity,. Bayes'

theorem, which allows *prior* assessments about the chances of a diagnosis to be combined with the test result in order to obtain *a posteriori* assessment, is illustrated in the context of a predictive value of a test and a likelihood ratio. Relative (or receiver) operating characteristic curves (ROC curves), valuable tools for decisions on cut-off points in diagnostic tests, are also invariably discussed. Statistical methods are most frequently used to summarize or, in other words, describe data. In the "Data Description" is the subject for defining qualitative and quantitative data, and scales of measurement. The section on the categorical data is particularly interesting. In presentation use of pie charts are discouraged for summarizing categorical data, since the human eye is not very good at comparing angles. In addition, the theory describes different statistical approaches to summarizing categorical data, particularly useful in epidemiological and clinical studies: absolute and relative risk reduction, and number needed to treat (expect to number of people to treat in each group for every person to benefit the test treatment). Another interesting and useful topic is within-subject variability, i.e., variability of measurements made repeatedly on one subject." From Sample to Population", the general introduction of the terms population, parameters, and sample. Then, they describe the well-known normal distribution, as well as two other distributions: binomial distribution and Poisson distribution. The latter two sections, although short, are not only straightforward and easy to understand, but are also illustrated with simple and practical examples from clinical research. "Statistical Inference", must begin with the description of the null hypothesis and introduces the p-value. Three common statistical tests are described: Student's t-test, the chi-squared test,

The statistical power and non-parametric tests are mentioned as well. Although greater statistical power makes parametric tests more popular than the non-parametric, the use of a non-parametric test is sometimes unavoidable. Therefore, the section on non-parametric statistics should have been more detailed. Statistical techniques used for dealing with relationships between variables are the subject of the seventh chapter. If we have in mind that the substantial parts of published research include correlation or regression analyses, it is a very good idea to pay so much attention to their description. Their advantages and limitations are explained in detail, as well as assumptions and possible problems (and solutions!) one might have performing them. Describing dedication to a

Single type of study: “The Randomized Controlled Trial”, widely recognized as the most valuable clinical study. This study highlights two features of the randomized controlled trial: design and protocol. The investigator planning her/his trial will certainly appreckes as frequent in statistical analysis, different misuses of statistics can be found even in manuscripts published in very fine journals. Among other common mistakes, the authors deal with the use of correlation to compare two, usually diagnostic, protocols. Since that comparison is inappropriate for a number of reasons, an alternative approach is given – scatter diagram of difference between methods against mean of both. It is both efficient and easy to perform. Another pitfall based on correlation analysis, but seldom explained in other literature is plotting the change against the initial value. Again the authors offer a simple solution – regression to the mean. Problem of repeated measures, common in clinical practice, requires detail discussion, including both the invalid and valid approaches. The inexperienced reader will probably find some of them difficult to follow. However, I am not aware of anyone who performs statistics “manually” these days. Moreover, the authors recommend the use of commercial software packages, in order to avoid arithmetical mistakes. If you want to test your knowledge and understanding of statistics, there is a list of multiple choice questions in Appendix II. Fortunately, unlike most books, the authors have provided not only the answers, but explanations as well. The list of statistical tables is rather short, including only 5. A feature very useful for a “novice” in medical statistics and medical research is that all the chapters are accompanied with guidelines for evaluation of statistical methods in the literature. In addition, the literature must contain an excellent list of references. “Medical Statistics”, it certainly is not a classic statistical manual. The investigator feel that “The design of studies is often not given sufficient emphasis on statistics, but as practical medical statisticians, we spend much more of our time giving advice on the design of the studies than we do on actual analysis”.

Consequently, the focus of this literature is not on the different statistical tests, but on the design of (most) clinical studies. Therefore, readers interested in statistical tests and statistics in some other fields of biomedical research should consult some other manuals. “Medical statistics” provides an excellent overview of clinical studies and introduces the reader to medical research. It can be recommended not only to medical students but to medical practitioners as well. Although “most medical

Practitioners do not carry out medical research if they pride themselves on being up to date, they will definitely be *consumers* of medical research, and apply the research in everyday work.

**(Foot note)** *Ivan Krešimir Lucia 1 Emerson JD, Cowlitz GA. Use of statistical analysis in the New England Journal of Medicine. N Engle J Med 1983; 309:709-13.
2 Petroveèki M. Approach to scientific research [in Croatian]. In: Marušiæ M, Petroveèki M, Petrakis J, Marušiæ A, editors. Introduction to scientific research in medicine. 2nd ed. Zagreb: Medici's macadam; 2000. p. 63-73.222

## ➢ Data collection:

The statistical classification of data by using Statistical software spss. The frequency, Mean, Median, s.d, Variance, Mode, T-test, F-test and Chi-Square Test was perfomed.

The following person helped and supported in the data collection process

- ❖ Dr. Kirtibhai patel, Deputy Director, (GCRI). He gave the permission to collect data and recommended to
- ❖ Dr. Parimalbhai Jivra Jani.
- ❖ Dr. Parimalbhai Jivra Jani of community oncology centre. Asked to come after a month, Later he recommended Statistical Assiststant Mr.Jayesh Solanki and Mr.Himanshu Patel Both Mr. Jayesh Solanki and Mr. Himanshu patel provided the required data. A daily visit was required to collect the data from GCRI.

The Gujarat Cancer & Research Institute (GCRI) established in the year 1972, is a functional autonomous body jointly managed by Government of Gujarat and Gujarat Cancer Society. It is also a Regional Cancer Centre of Government of India and getting assistance under National Cancer Control Programme. GCRI is a unique example of cooperation between State Government, Central Government, and Non-Government Organization – Gujarat Cancer & Research Institute. It is good and fortunate that Gujarat Cancer Society established in 1961 and is instrumental in creating initial infrastructure of Cancer Hospital in Gujarat with the donation from people

of Gujarat. It is worth mentioning that Gujarat Cancer Society is blessed by His Excellency, Governor of Gujarat. Today our Institute has attained the status of premier cancer institute of the country and caters to patients from Gujarat, Rajasthan, Madhya Pradesh and neighbouring State of Maharashtra.

GCRI is a regional comprehensive cancer centre recognized by Health & Family Welfare, GOI; UICC; WHO.

GCRI is a 650 Beds teaching hospital with Multi-disciplinary superspecialty Comprehensive cancer care under a single roof in western India. GCRI has the first dedicated pediatric oncology center.

**In this thesis we have use the following statistical methodology:**

1 discriptive statistics like mean median, mode, sd and plot histographs.
2 test of mean (t-test).
3 Analysis of variance
4 independent sample t-tests
5 Test of association and propotion (chi –square tests).
6 Logestic regressions.

# CHAPTER 4

# Objectives and Hypothesis of Study

# CHAPTER 4 OBJECTIVES AND HYPOTHESIS OF STUDY:

## (4.1) OBJECTIVES:

1. To develop approximation smoothing in parameter estimatio for Bio medical inferences.
2. To develop algorithms, Numerical calculation and accuracy by measuring approximation fundamentals.
3. To Estimate Sample Weights Vs Sample errors.
4. Develop innovative techniques for large scale parameter estimation in Biomedical Inferences.

## (4.2) HYPOTHESIS:

- There is no significance difference between Male & Female as far as as occurance of disease /calsenoma is concered.
- There is no significance difference between Married & Unmarried person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between Unmarried & widowed person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between Unmarried & Divorced person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between Married & Widowed person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between Married & Divorced person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between Widowed & Divorced person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between person's having different monther tongue (Guj & Hindi) as far as occurance of calsenoma/disease is concered.

- There is no significance difference between person's having different monther tongue (Guj & Other) as far as occurance of calsenoma/disease is concered.
- There is no significance difference between person's having different monther tongue (Hindi & Other) as far as occurance of calsenoma/disease is concered.
- There is no significance difference between the Religions (Hindu &Muslim) of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between the Religions (Hindu &Jain) of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between the Religions (Hindu &Sikh) of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between the Religions (Hindu& Christian) of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between the Religions (Muslim &Jain) of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between the Religions (Muslim &Sikh) of a person as far as occurance of calsenoma/disease is concered.

- There is no significance difference between the Religions (Muslim& Christian) of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between the Religions (Jain &Christian) of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between the Religions (Sikh& Christian) of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between below 20 age group and 20-30 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between below 20 age group and 30-40 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between below 20 age group and 40-50 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between below 20 age groups and 50-60 age groups of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between below 20 age group and 60-70 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between below 20 age group and above 70 age group of a person as far as occurance of calsenoma/disease is concered.

- There is no significance difference between 20-30 age groups and 30-40 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between 20-30 age groups and 30-40 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between 20-30 age groups and 40-50 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between 20-30 age group and 50-60 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between 20-30 age group and 60-70 age groups of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between 20-30 age group and above 70 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between 30-40 age groups and 40-50 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between 30-40 age groups and 50-60 age groups of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between 30-40 age groups and 60-70 age group of a person as far as occurance of calsenoma/disease is concered.

- There is no significance difference between 30-40 age groups and above 70 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between 40-50 age group and above 50-60 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between 40-50 age group and above 60-70 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between 40-50 age groups and above 70 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between 50-60 age groups and 60-70 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between 50-60 age group and above 70 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between 60-70 age groups and above 70 age group of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between below 40 age group and above 40 age group of a person as far as occurance of disease/cilesenoma is concered.
- There is no significant difference between the Proportions of the disease 1 to 76 in two age groups.

- There is no significant difference between the Proportions of the disease numbers 11, 13, 15, 17, 23, 33, 36, 48 & 68 in two age groups.
- There is no significant difference between propotions of the disease between male & female having disease numbers 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- There is no significant effect between propotion of the diseases of the marital-status having disease no. 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- There is no significant effect between propotions of the disease of a language having disease number 11, 13, 15, 23, 33, 36, 48 & 68.
- There is no significant effect of the propotions of the disease of the different Age-group having disease number 11, 13, 15, 23, 33, 36, 48 & 68.
- There is no significant effect of the propotions of the disease of the different Age-group having disease number 11, 13, 15, 23, 33, 36, 48 & 68.
- There is no significance difference between male and female of persons having disease number 1 to 76 as far as occurance of calsenoma/disease is concered.
- There is no significance difference between male and female of persons having disease number 11, 13, 15, 23, 33, 36, 48, & 68 as far as occurance of calsenoma/disease is concered.
- There is no significance difference between Unmarried and married of persons as far as occurance of calsenoma/disease is concered.

- There is no significance difference between Unmarried and widowed of a persons having disease number 11, 13, 15, 23, 33, 36, 48, & 68 as far as occurance of calsenoma/disease is concered.
- There is no significance difference between Unmarried and divorced of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between married and widowed of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between married and divorced of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between widowed and divorced of a person as far as occurance of calsenoma/disease is concered.
- There is no significance difference between persons having different
- Mother tongue (Gujarati&Hindi) as far as occurrence of cailsenoma/disease is concerned.
- There is no significance difference between persons having different mother tongue (Gujarati&Other) as far as occurrence of cailsenoma/disease are concerned.
- There is no significance difference between persons having different mother tongue (Hindi&Other) as far as occurrence of cailsenoma/disease are concerned.
- There is no significance difference between religions (Hindu &Muslim) of persons as far as occurrence of cailsenoma/disease is concerned.
- There is no significance difference between religions (Hindu&Jain) of persons as far as occurrence of cailsenoma/disease is concerned.

- There is no significance difference between religions (Hindu &Sikh) of persons as far as occurrence of cailsenoma/disease is concerned.
- There is no significance difference between religions (Hindu &Christian) of persons as far as occurrence of cailsenoma/disease is concerned.
- There is no significance difference between religions (Muslim &Jain) of persons as far as occurrence of cailsenoma/disease is concerned.
- There is no significance difference between religions (Muslim &Sikh) of persons as far as occurrence of cailsenoma/disease is concerned.
- There is no significance difference between religions (Muslim &Christian) of persons as far as occurrence of cailsenoma/disease is concerned.
- There is no significance difference between religions (Jain &Christian) of persons as far as occurrence of cailsenoma/disease is concerned.
- There is no significance difference between religions (Sikh &Christian) of persons as far as occurrence of cailsenoma/disease is concerned.
- Average number of patients in the below 40 age Group is same as the above 40 age Group.

# CHAPTER 5

# Data Analysis and Description

# CHAPTER 5 DATA ANALYSIS AND DESCRIPTION:

## Preface:

With reference to the subject biomedical statistical inferences: Weighted Fourier series approximationparameter estimation. The data process has been done for this process. The population has been considered and selection of sample was done to collect the data. The collected data was classified into statistical method and analystical process was carried out.

**Subject:** Biomedical statistical inferences: Weighted Fourier series approximationparameter estimation.

**Population:** Cancer patients From Gujarat cancer research institute (GCRI) at Ahmedabad Civil hospital.

**Sample:** Data of Gujarat cancer research institute (GCRI) of the year2000, 2002,2003,2004,2005 and 2006.We have collected a data of cancer patients from Gujarat cancer research institute (GCRI) in different years as below.

127 patients from year 2000.
130 patients from year 2002.
127 patients from year 2003.
226 patients from year 2004.
308 patients from year 2005.
091 patients from year 2006.

Thus we have total 1009 patients. Also we have collected extra information of the cancer patient like gender, Martial-status, Religions, Languange and age-group.

- Table-1 denotes frequency distribution of the patient Yearwise.
- Table-2 denotes frequency distribution of the male & female patient.
- Table-3 denotes frequency distribution of the patient Matrial status wise.
- Table-4 denotes frequency distribution of the patient Mother Tounge wise.

- Table-5 denotes frequency distribution of the patient Religion wise.
- Table-6 denotes frequency distribution of the patient Age –group wise.
- Table-7 some measures of central tendency and dispersion are calculated.
- Table-8 demostrare the test of significance difference between cancer disease of male and female.
- Table-9 demostrare the test of significance difference between cancer diseases of Marital-status wise. (Unmarried and Married).
- Table-10 demostrare the test of significance difference between cancer diseases of Marital-status wise. (Unmarried and Widowed).
- Table-11 demostrare the test of significance difference between cancer diseases of Marital-status wise. (Unmarried and Divorced).
- Table-12 demostrare the test of significance difference between cancer diseases of Marital-status wise. (Married and Widowed).
- Table-13 demostrare the test of significance difference between cancer diseases of Marital-status wise. (Married and Divorced).
- Table-14 demostrare the test of significance difference between cancer disease of Marital-status wise.(Widowed and Divorced).
- Table-15 demostrare the test of significance difference between cancer diseases of Mother-tounge wise. (Gujarati and Hindi).
- Table-16 demostrare the test of significance difference between cancer diseases of Mother-tounge wise. (Gujarati and other).
- Table-17 demostrare the test of significance difference between cancer diseases of Mother-tounge wise. (Hindi and other).
- Table-18 demostrare the test of significance difference between cancer disease of Religion wise (Hindu and Muslim).
- Table-19 demostrare the test of significance difference between cancer disease of Religion wise (Hindu and Jain).
- Table-20 demostrare the test of significance difference between cancer disease of Religion wise (Hindu and Sikh).
- Table-21 demostrare the test of significance difference between cancer disease of Religion wise (Hindu and Christian).
- Table-22 demostrare the test of significance difference between cancer disease of Religion wise (Muslim and Jain).
- Table-23 demostrare the test of significance difference between cancer disease of Religion wise (Muslim and Sikh).

- Table-24 demostrare the test of significance difference between cancer disease of Religion wise (Muslim and Christian).
- Table-25 demostrare the test of significance difference between cancer disease of Religion wise (Jain and Christian).
- Table-26 demostrare the test of significance difference between cancer disease of Religion wise (Sikh and Christian).
- Table-27 demostrare the test of significance difference between cancer disease of Age-Group wise (Below 20 and 20-30).
- Table-28 demostrare the test of significance difference between cancer disease of Age-Group wise (Below 20 and 30-40).
- Table-29 demostrare the test of significance difference between cancer disease of Age-Group wise (Below 20 and 40-50).
- Table-30 demostrare the test of significance difference between cancer disease of Age-Group wise (Below20 and 50-60).
- Table-31 demostrare the test of significance difference between cancer disease of Age-Group wise (Below 20 and 60-70).
- Table-32 demostrare the test of significance difference between cancer disease of Age-Group wise (Below 20 and above70).
- Table-33 demostrare the test of significance difference between cancer disease of Age-Group wise (20-30 and 30-40).
- Table-34 demostrare the test of significance difference between cancer disease of Age-Group wise (20-30 and 40-50).
- Table-35 demostrare the test of significance difference between cancer disease of Age-Group wise (20-30 and 50-60).
- Table-36 demostrare the test of significance difference between cancer disease of Age-Group wise (20-30 and 60-70).
- Table-37 demostrare the test of significance difference between cancer disease of Age-Group wise (20-30 and Above70).
- Table-38 demostrare the test of significance difference between cancer disease of Age-Group wise (30-40 and 40-50).
- Table-39 demostrare the test of significance difference between cancer disease of Age-Group wise (30-40 and 50-60).
- Table-40 demostrare the test of significance difference between cancer disease of Age-Group wise (30-40 and 60-70).
- Table-41 demostrare the test of significance difference between cancer disease of Age-Group wise (30-40 and above70).

- Table-42 demostrare the test of significance difference between cancer disease of Age-Group wise (40-50 and 50-60).
- Table-43 demostrare the test of significance difference between cancer disease of Age-Group wise (40-50 and 60-70).
- Table-44 demostrare the test of significance difference between cancer disease of Age-Group wise (40-50 and above70).
- Table-45 demostrare the test of significance difference between cancer disease of Age-Group wise (50-60 and 60-70).
- Table-46 demostrare the test of significance difference between cancer disease of Age-Group wise (50-60 and above70).
- Table-47 demostrare the test of significance difference between cancer disease of Age-Group wise (60-70 and above70).
- Table-48 we have made comprision between gender, martial-status, mother-tongue, religion and age-group using oneway anova. The results are tabulate in the number **so and so**
- Table 49 demostrate the number of count of disease & year.
- Table 50 demostrate the number of count of disease & Gender.
- Table 51 demostrate the number of count of disease & marital-status.
- Table 52 demostrate the number of count of disease & languages.
- Table 53 demostrate the number of count of disease & religions.
- Table 54 demostrate the number of count of disease & Age-groups.
- Table 55 demostrate the test of significance difference between cancer diseases of below age 40 & above age 40.
- Table 56 demostrate the test of significance difference between cancer diseases of propotion of two age groups (age below 40 &above 40).
- Table 57 demostrate the test of significance difference between cancer disease of propotion of male &female having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 58 demostrate the test of significance difference between cancer disease of propotion of marital status having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 59 demostrate the test of significance difference between cancer disease of propotion of language having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 60 demostrate the test of significance difference between cancer disease of propotions of religions (Hindu, Muslim, Jain,

Charistian) having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.

- Table 61 demostrate the test of significance difference between cancer disease of propotion of age group (below 20, 20-30, 30-40, 40-50, 50-60, 60-70 & above 70) having disease number 11, 13, 15, 17, 23, 33, 36 ,48 & 68.
- Table 62 demostrate the test of significance difference between cancer disease of propotion of male&female of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 63 demostrate the test of significance difference between cancer disease of propotion of male&female of a person having disease number 1 to 76.
- Table 64 demostrate the test of significance difference between cancer disease of propotion of unmarried & married of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 65 demostrate the test of significance difference between cancer disease of propotion of unmarried & widowed of a person having Disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 66 demostrate the test of significance difference between cancer disease of propotion of unmarried & divoced of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 67 demostrate the test of significance difference between cancers disease of propotion of married & widowed of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 68 demostrate the test of significance difference between cancers disease of propotion of married & divoced of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 69 demostrate the test of significance difference between cancer disease of propotion of widowed & divoced of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 70 demostrate the test of significance difference between cancer disease of propotion of mother tongue (Guj & Hindi Lang ) of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 71 demostrate the test of significance difference between cancer disease of propotion of mother tongue (Guj &other Lang) of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.

- Table 72 demostrate the test of significance difference between cancer disease of propotion of mother tongue (Hindi &other Lang) of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 73 demostrate the test of significance difference between cancer disease of propotion of religion (Hindu & mulsim) of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 74 demostrate the test of significance difference between cancer disease of propotion of religion (Hindu &Jain) of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 75 demostrate the test of significance difference between cancer disease of propotion of religion (Hindu & Sikh) of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 76 demostrate the test of significance difference between cancer Disease of propotion of religion (Hindu & Christian) of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 77 demostrate the test of significance difference between cancer disease of propotion of religion (Muslim &Jain) of a person having disease number 11, 13,15,17,23, 33, 36, 48 & 68.
- Table 78 demostrate the test of significance difference between cancer disease of propotion of religion (Muslim & Sikh) of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 79 demostrate the test of significance difference between cancer diseases of propotion of religions (Muslim & Christian) of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48, 68.
- Table 80 demostrate the test of significance difference between cancer disease of propotion of religions (Jain &Christian) of a person having disease number 11, 13,15,17,23, 33, 36, 48 & 68.
- Table 81 demostrate the test of significance difference between cancer disease of propotion of religions (Sikh & Christian) of a person having disease number 11, 13, 15, 17, 23, 33, 36, 48 & 68.
- Table 82 demostrate the test of significance difference between cancers disease of propotion of Age group (below 40 & above 40) of a person having disease number 1 to 76.
- Table 83 demostrate the test of Cancer disease of Logestics Regression Analysis.

## Data collection:

The statistical classification of data by using Statistical software spss. The frequency, Mean, Median, s.d, Variance, Mode, T-test and F-test was perfomed.

The following persone helped and supported in the data collection process

- Dr. Kirtibhai patel, Deputy Director, (GCRI). He gave the permission to collect data and recommended to
- Dr. Parimalbhai Jivra Jani.
- Dr. Parimalbhai Jivra Jani of community oncology centre. Asked to come after a month, Later he recommended Statistical Assiststant Mr.Jayesh Solanki and Mr.Himanshu Patel Both Mr. Jayesh Solanki and Mr. Himanshu patel provided the required data. A daily visit was required to collect the data from GCRI.

The Gujarat Cancer & Research Institute (GCRI) established in the year 1972, is a functional autonomous body jointly managed by Government of Gujarat and Gujarat Cancer Society. It is also a Regional Cancer Centre of Government of India and getting assistance under National Cancer Control Programme. GCRI is a unique example of cooperation between State Government, Central Government, and Non-Government Organization – Gujarat Cancer & Research Institute. It is good and fortunate that Gujarat Cancer Society established in 1961 and is instrumental in creating initial infrastructure of Cancer Hospital in Gujarat with the donation from people of Gujarat. It is worth mentioning that Gujarat Cancer Society is blessed by His Excellency, Governor of Gujarat. Today our Institute has attained the status of premier cancer institute of the country and caters to patients from Gujarat, Rajasthan, Madhya Pradesh and neighbouring State of Maharashtra.

GCRI is a regional comprehensive cancer centre recognized by Health & Family Welfare, GOI; UICC; WHO.

GCRI is a 650 Beds teaching hospital with Multi-disciplinary superspecialty Comprehensive cancer care under a single roof in western India. GCRI has the first dedicated pediatric oncology center.

## Frequencies

| | | YEAR | GENDER | MAR_STAT | LANG | RELIGION | AGE_GR |
|---|---|---|---|---|---|---|---|
| N | Valid | 1009 | 1009 | 1009 | 1009 | 1009 | 1009 |
| | Missing | 0 | 0 | 0 | 0 | 0 | 0 |

## Frequency Table -1

**YEAR**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | 2000 | 127 | 12.6 | 12.6 | 12.6 |
| | 2002 | 130 | 12.9 | 12.9 | 25.5 |
| | 2003 | 127 | 12.6 | 12.6 | 38.1 |
| | 2004 | 226 | 22.4 | 22.4 | 60.5 |
| | 2005 | 308 | 30.5 | 30.5 | 91.0 |
| | 2006 | 91 | 9.0 | 9.0 | 100.0 |
| | Total | 1009 | 100.0 | 100.0 | |

## Frequency Table-2

**GENDER**

| | | Frequency | Percent | Valid Percent | Cumulative Percent |
|---|---|---|---|---|---|
| Valid | Male | 603 | 59.8 | 59.8 | 59.8 |
| | Female | 406 | 40.2 | 40.2 | 100.0 |
| | Total | 1009 | 100.0 | 100.0 | |

## Frequency Table-3

| MAR_STAT | | | | | |
|---|---|---|---|---|---|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Unmarried | 63 | 6.2 | 6.2 | 6.2 |
| | Married | 861 | 85.3 | 85.3 | 91.6 |
| | Widowed | 80 | 7.9 | 7.9 | 99.5 |
| | Divorced | 5 | .5 | .5 | 100.0 |
| | Total | 1009 | 100.0 | 100.0 | |

## Frequency Table-4

| LANG | | | | | |
|---|---|---|---|---|---|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Gujarati | 822 | 81.5 | 81.5 | 81.5 |
| | Hindi | 167 | 16.6 | 16.6 | 98.0 |
| | Other | 20 | 2.0 | 2.0 | 100.0 |
| | Total | 1009 | 100.0 | 100.0 | |

## Frequency Table-5

| RELIGION | | | | | |
|---|---|---|---|---|---|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | Hindu | 936 | 92.8 | 92.8 | 92.8 |
| | Muslim | 69 | 6.8 | 6.8 | 99.6 |
| | Jain | 1 | .1 | .1 | 99.7 |
| | Sikh | 1 | .1 | .1 | 99.8 |
| | Christian | 2 | .2 | .2 | 100.0 |
| | Total | 1009 | 100.0 | 100.0 | |

# Frequency Table-6

| AGE_GR | | | | | |
|---|---|---|---|---|---|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | < 20 | 39 | 3.9 | 3.9 | 3.9 |
| | 20 - 30 | 58 | 5.7 | 5.7 | 9.6 |
| | 30 - 40 | 156 | 15.5 | 15.5 | 25.1 |
| | 40 - 50 | 263 | 26.1 | 26.1 | 51.1 |
| | 50 - 60 | 262 | 26.0 | 26.0 | 77.1 |
| | 60 - 70 | 159 | 15.8 | 15.8 | 92.9 |
| | > 70 | 72 | 7.1 | 7.1 | 100.0 |
| | Total | 1009 | 100.0 | 100.0 | |

# Table-7

**Case Processing Summary**

| | Cases | | | | | |
|---|---|---|---|---|---|---|
| | Included | | Excluded | | Total | |
| | N | Percent | N | Percent | N | Percent |
| DIESEAS * GENDER * LANG * MAR_STAT * RELIGION * AGE_GR | 1009 | 100.0% | 0 | .0% | 1009 | 100.0% |

Report
DIESEAS

| GENDER | LANG | MAR_STAT | RELIGION | AGE_GR | Mean | N | Std. Deviation | Median | Variance |
|---|---|---|---|---|---|---|---|---|---|
| Male | Gujarati | Unmarried | Hindu | < 20 | 25.67 | 21 | 20.723 | 20.00 | 429.433 |
| | | | | 20 – 30 | 26.29 | 7 | 21.061 | 15.00 | 443.571 |
| | | | | 30 – 40 | 15.00 | 1 | . | 15.00 | . |
| | | | | 40 – 50 | 41.67 | 3 | 16.503 | 37.00 | 272.333 |
| | | | | 50 – 60 | 28.00 | 1 | . | 28.00 | . |
| | | | | 60 – 70 | 54.00 | 1 | . | 54.00 | . |
| | | | | Total | 27.79 | 34 | 20.101 | 23.00 | 404.047 |
| | | | Muslim | < 20 | 26.50 | 2 | 17.678 | 26.50 | 312.500 |
| | | | | 20 – 30 | 20.00 | 1 | . | 20.00 | . |
| | | | | Total | 24.33 | 3 | 13.051 | 20.00 | 170.333 |
| | | | Total | < 20 | 25.74 | 23 | 20.116 | 20.00 | 404.656 |
| | | | | 20 – 30 | 25.50 | 8 | 19.625 | 17.50 | 385.143 |
| | | | | 30 – 40 | 15.00 | 1 | . | 15.00 | . |
| | | | | 40 – 50 | 41.67 | 3 | 16.503 | 37.00 | 272.333 |
| | | | | 50 – 60 | 28.00 | 1 | . | 28.00 | . |
| | | | | 60 – 70 | 54.00 | 1 | . | 54.00 | . |
| | | | | Total | 27.51 | 37 | 19.513 | 22.00 | 380.757 |
| | | Married | Hindu | 20 – 30 | 40.71 | 14 | 24.721 | 37.00 | 611.143 |
| | | | | 30 – 40 | 34.17 | 59 | 20.326 | 26.00 | 413.143 |
| | | | | 40 – 50 | 89.23 | 109 | 577.511 | 33.00 | 333519.030 |
| | | | | 50 – 60 | 32.85 | 123 | 18.784 | 33.00 | 352.837 |
| | | | | 60 – 70 | 37.58 | 71 | 17.890 | 36.00 | 320.047 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | > 70 | 41.03 | 32 | 19.218 | 39.00 | 369.322 |
| | | | | Total | 49.84 | 408 | 298.902 | 33.00 | 89342.295 |
| | | | Muslim | 20 – 30 | 37.67 | 3 | 26.577 | 52.00 | 706.333 |
| | | | | 30 – 40 | 42.40 | 5 | 23.384 | 47.00 | 546.800 |
| | | | | 40 – 50 | 31.89 | 9 | 18.543 | 23.00 | 343.861 |
| | | | | 50 – 60 | 27.80 | 10 | 21.070 | 22.50 | 443.956 |
| | | | | 60 – 70 | 56.40 | 5 | 14.293 | 60.00 | 204.300 |
| | | | | Total | 36.63 | 32 | 21.455 | 34.50 | 460.306 |
| | | | Christian | 40 – 50 | 84.00 | 1 | . | 48.00 | . |
| | | | | Total | 48.00 | 1 | . | 48.00 | . |
| | | | Total | 20 – 30 | 40.18 | 17 | 24.213 | 48.00 | 586.279 |
| | | | | 30 – 40 | 34.81 | 64 | 20.495 | 27.00 | 420.028 |
| | | | | 40 – 50 | 84.55 | 119 | 552.740 | 33.00 | 305521.080 |
| | | | | 50 – 60 | 32.47 | 133 | 18.925 | 33.00 | 358.160 |
| | | | | 60 – 70 | 38.82 | 76 | 18.212 | 36.50 | 331.672 |
| | | | | > 70 | 41.03 | 32 | 19.218 | 39.00 | 369.322 |
| | | | | Total | 48.87 | 441 | 287.551 | 33.00 | 82685.825 |
| | | Widowed | Hindu | 30 – 40 | 28.00 | 1 | . | 28.00 | . |
| | | | | 40 – 50 | 47.00 | 1 | . | 47.00 | . |
| | | | | 50 – 60 | 57.50 | 2 | 14.849 | 57.50 | 220.500 |
| | | | | 60 – 70 | 35.50 | 4 | 9.539 | 34.50 | 91.000 |
| | | | | > 70 | 43.80 | 5 | 21.833 | 47.00 | 476.700 |
| | | | | Total | 42.38 | 13 | 16.546 | 47.00 | 273.756 |
| | | | Total | 30 – 40 | 28.00 | 1 | . | 28.00 | . |
| | | | | 40 – 50 | 47.00 | 1 | . | 47.00 | . |
| | | | | 50 – 60 | 57.50 | 2 | 14.849 | 57.50 | 220.500 |
| | | | | 60 – 70 | 35.50 | 4 | 9.539 | 34.50 | 91.000 |
| | | | | > 70 | 43.80 | 5 | 21.833 | 47.00 | 476.700 |
| | | | | Total | 42.38 | 13 | 16.546 | 47.00 | 273.756 |
| | | Divorced | Hindu | 40 – 50 | 29.00 | 1 | . | 29.00 | . |
| | | | | Total | 29.00 | 1 | . | 29.00 | . |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | 40 – 50 | 29.00 | 1 | . | 29.00 | . |
| | | | | Total | 29.00 | 1 | . | 29.00 | . |
| | | Total | Hindu | < 20 | 25.67 | 21 | 20.723 | 20.00 | 429.433 |
| | | | | 20 – 30 | 35.90 | 21 | 24.060 | 26.00 | 578.890 |
| | | | | 30 – 40 | 33.75 | 61 | 20.148 | 26.00 | 405.955 |
| | | | | 40 – 50 | 87.08 | 114 | 564.685 | 33.00 | 318869.649 |
| | | | | 50 – 60 | 33.20 | 126 | 18.866 | 33.00 | 355.920 |
| | | | | 60 – 70 | 37.68 | 76 | 17.498 | 36.00 | 306.166 |
| | | | | > 70 | 41.41 | 37 | 19.285 | 40.00 | 371.914 |
| | | | | Total | 47.93 | 456 | 282.823 | 33.00 | 79988.919 |
| | | | Muslim | < 20 | 26.50 | 2 | 17.678 | 26.50 | 312.500 |
| | | | | 20 – 30 | 33.25 | 4 | 23.429 | 36.00 | 548.917 |
| | | | | 30 – 40 | 42.40 | 5 | 23.384 | 47.00 | 546.800 |
| | | | | 40 – 50 | 31.89 | 9 | 18.543 | 23.00 | 343.861 |
| | | | | 50 – 60 | 27.80 | 10 | 21.070 | 22.50 | 443.956 |
| | | | | 60 – 70 | 56.40 | 5 | 14.293 | 60.00 | 204.300 |
| | | | | Total | 35.57 | 35 | 21.021 | 33.00 | 441.899 |
| | | | Christian | 40 – 50 | 48.00 | 1 | . | 48.00 | . |
| | | | | Total | 48.00 | 1 | . | 48.00 | . |
| | | | Total | < 20 | 25.74 | 23 | 20.116 | 20.00 | 404.656 |
| | | | | 20 – 30 | 35.48 | 25 | 23.495 | 26.00 | 552.010 |
| | | | | 30 – 40 | 34.41 | 66 | 20.339 | 27.00 | 413.692 |
| | | | | 40 – 50 | 82.76 | 124 | 541.465 | 33.00 | 293184.120 |
| | | | | 50 – 60 | 32.80 | 136 | 19.004 | 33.00 | 361.153 |
| | | | | 60 – 70 | 38.84 | 81 | 17.827 | 36.00 | 317.786 |
| | | | | > 70 | 41.41 | 37 | 19.285 | 40.00 | 371.914 |
| | | | | Total | 47.05 | 492 | 272.332 | 33.00 | 74164.871 |
| | Hindi | Unmarried | Hindu | < 20 | 22.33 | 3 | 17.898 | 12.00 | 320.333 |
| | | | | 20 – 30 | 14.00 | 1 | . | 14.00 | . |
| | | | | 40 – 50 | 35.00 | 1 | . | 35.00 | . |
| | | | | Total | 23.20 | 5 | 14.721 | 14.00 | 216.700 |
| | | | Total | < 20 | 22.33 | 3 | 17.898 | 12.00 | 320.333 |
| | | | | 20 – 30 | 14.00 | 1 | . | 14.00 | . |
| | | | | 40 – 50 | 35.00 | 1 | . | 35.00 | . |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | 23.20 | 5 | 14.721 | 14.00 | 216.700 |
| | | Married | Hindu | 20 – 30 | 34.50 | 6 | 32.365 | 34.50 | 1047.500 |
| | | | | 30 – 40 | 30.11 | 9 | 22.779 | 20.00 | 518.861 |
| | | | | 40 – 50 | 32.62 | 13 | 20.378 | 25.00 | 415.256 |
| | | | | 50 – 60 | 33.16 | 25 | 17.738 | 33.00 | 314.640 |
| | | | | 60 – 70 | 37.17 | 23 | 18.396 | 36.00 | 338.423 |
| | | | | > 70 | 38.31 | 16 | 18.431 | 41.50 | 339.696 |
| | | | | Total | 34.77 | 92 | 19.645 | 36.00 | 385.914 |
| | | | Muslim | 20 – 30 | 37.00 | 1 | . | 37.00 | . |
| | | | | 40 – 50 | 31.50 | 2 | 23.335 | 31.50 | 544.500 |
| | | | | Total | 33.33 | 3 | 16.803 | 37.00 | 282.333 |
| | | | Total | 20 – 30 | 34.86 | 7 | 29.560 | 37.00 | 873.810 |
| | | | | 30 – 40 | 30.11 | 9 | 22.779 | 20.00 | 518.861 |
| | | | | 40 – 50 | 32.47 | 15 | 19.874 | 25.00 | 394.981 |
| | | | | 50 – 60 | 33.16 | 25 | 17.738 | 33.00 | 314.640 |
| | | | | 60 – 70 | 37.17 | 23 | 18.396 | 36.00 | 338.423 |
| | | | | > 70 | 38.31 | 16 | 18.431 | 41.50 | 339.696 |
| | | | | Total | 34.73 | 95 | 19.485 | 36.00 | 379.669 |
| | | Total | Hindu | < 20 | 22.33 | 3 | 17.898 | 12.00 | 320.333 |
| | | | | 20 – 30 | 31.57 | 7 | 30.544 | 14.00 | 932.952 |
| | | | | 30 – 40 | 30.11 | 9 | 22.779 | 20.00 | 518.861 |
| | | | | 40 – 50 | 32.79 | 14 | 19.589 | 26.50 | 383.720 |
| | | | | 50 – 60 | 33.16 | 25 | 17.738 | 33.00 | 314.640 |
| | | | | 60 – 70 | 37.17 | 23 | 18.396 | 36.00 | 338.423 |
| | | | | > 70 | 38.31 | 16 | 18.431 | 41.50 | 339.696 |
| | | | | Total | 34.18 | 97 | 19.531 | 36.00 | 381.459 |
| | | | Muslim | 20 – 30 | 37.00 | 1 | . | 37.00 | . |
| | | | | 40 – 50 | 31.50 | 2 | 23.335 | 31.50 | 544.500 |
| | | | | Total | 33.33 | 3 | 16.803 | 37.00 | 282.333 |
| | | | Total | < 20 | 22.33 | 3 | 17.898 | 12.00 | 320.333 |
| | | | | 20 – 30 | 32.25 | 8 | 28.344 | 25.50 | 803.357 |
| | | | | 30 – 40 | 30.11 | 9 | 22.779 | 20.00 | 518.861 |
| | | | | 40 – 50 | 32.63 | 16 | 19.211 | 26.50 | 369.050 |
| | | | | 50 – 60 | 33.16 | 25 | 17.738 | 33.00 | 314.640 |
| | | | | 60 – 70 | 37.17 | 23 | 18.396 | 36.00 | 338.423 |
| | | | | > 70 | 38.31 | 16 | 18.431 | 41.50 | 339.696 |
| | | | | Total | 34.15 | 100 | 19.381 | 36.00 | 375.624 |
| | Other | Married | Hindu | 30 – 40 | 34.00 | 4 | 23.509 | 28.50 | 552.667 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 40 – 50 | 14.00 | 1 | . | 14.00 | . |
| | | | | 50 – 60 | 54.50 | 2 | 9.192 | 54.50 | 84.500 |
| | | | | 60 – 70 | 41.00 | 2 | 11.314 | 41.00 | 128.000 |
| | | | | > 70 | 36.00 | 1 | . | 36.00 | . |
| | | | | Total | 37.70 | 10 | 18.488 | 34.50 | 341.789 |
| | | | Muslim | > 70 | 68.00 | 1 | . | 68.00 | . |
| | | | | Total | 68.00 | 1 | . | 68.00 | . |
| | | | Total | 30 – 40 | 34.00 | 4 | 23.509 | 28.50 | 552.667 |
| | | | | 40 – 50 | 14.00 | 1 | . | 14.00 | . |
| | | | | 50 – 60 | 54.50 | 2 | 9.192 | 54.50 | 84.500 |
| | | | | 60 – 70 | 41.00 | 2 | 11.314 | 41.00 | 128.000 |
| | | | | > 70 | 52.00 | 2 | 22.627 | 52.00 | 512.000 |
| | | | | Total | 40.45 | 11 | 19.776 | 36.00 | 391.073 |
| | | Total | Hindu | 30 – 40 | 34.00 | 4 | 23.509 | 28.50 | 552.667 |
| | | | | 40 – 50 | 14.00 | 1 | . | 14.00 | . |
| | | | | 50 – 60 | 54.50 | 2 | 9.192 | 54.50 | 84.500 |
| | | | | 60 – 70 | 41.00 | 2 | 11.314 | 41.00 | 128.000 |
| | | | | > 70 | 36.00 | 1 | . | 36.00 | . |
| | | | | Total | 37.70 | 10 | 18.488 | 34.50 | 341.789 |
| | | | Muslim | > 70 | 68.00 | 1 | . | 68.00 | . |
| | | | | Total | 68.00 | 1 | . | 68.00 | . |
| | | | Total | 30 – 40 | 34.00 | 4 | 23.509 | 28.50 | 552.667 |
| | | | | 40 – 50 | 14.00 | 1 | . | 14.00 | . |
| | | | | 50 – 60 | 54.50 | 2 | 9.192 | 54.50 | 84.500 |
| | | | | 60 – 70 | 41.00 | 2 | 11.314 | 41.00 | 128.000 |
| | | | | > 70 | 52.00 | 2 | 22.627 | 52.00 | 512.000 |
| | | | | Total | 40.45 | 11 | 19.776 | 36.00 | 391.073 |
| | Total | Unmarried | Hindu | < 20 | 25.25 | 24 | 20.063 | 18.50 | 402.543 |
| | | | | 20 – 30 | 24.75 | 8 | 19.977 | 14.50 | 399.071 |
| | | | | 30 – 40 | 15.00 | 1 | . | 15.00 | . |
| | | | | 40 – 50 | 40.00 | 4 | 13.880 | 36.00 | 192.667 |
| | | | | 50 – 60 | 28.00 | 1 | . | 28.00 | . |
| | | | | 60 – 70 | 54.00 | 1 | . | 54.00 | . |
| | | | | Total | 27.21 | 39 | 19.394 | 22.00 | 376.115 |
| | | | Muslim | < 20 | 26.50 | 2 | 17.678 | 26.50 | 312.500 |
| | | | | 20 – 30 | 20.00 | 1 | . | 20.00 | . |
| | | | | Total | 24.33 | 3 | 13.051 | 20.00 | 170.333 |
| | | | Total | < 20 | 25.35 | 26 | 19.569 | 18.50 | 382.955 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 20 – 30 | 24.22 | 9 | 18.754 | 15.00 | 351.694 |
| | | | | 30 – 40 | 15.00 | 1 | . | 15.00 | . |
| | | | | 40 – 50 | 40.00 | 4 | 13.880 | 36.00 | 192.667 |
| | | | | 50 – 60 | 28.00 | 1 | . | 28.00 | . |
| | | | | 60 – 70 | 54.00 | 1 | . | 54.00 | . |
| | | | | Total | 27.00 | 42 | 18.907 | 21.00 | 357.463 |
| | | Married | Hindu | 20 – 30 | 38.85 | 20 | 26.502 | 37.00 | 702.345 |
| | | | | 30 – 40 | 33.65 | 72 | 20.521 | 25.50 | 421.131 |
| | | | | 40 – 50 | 82.63 | 123 | 543.720 | 32.00 | 295631.267 |
| | | | | 50 – 60 | 33.19 | 150 | 18.610 | 33.00 | 346.341 |
| | | | | 60 – 70 | 37.55 | 96 | 17.772 | 36.00 | 315.829 |
| | | | | > 70 | 40.04 | 49 | 18.619 | 38.00 | 346.665 |
| | | | | Total | 46.88 | 510 | 267.486 | 33.50 | 71548.927 |
| | | | Muslim | 20 – 30 | 37.50 | 4 | 21.703 | 44.50 | 471.000 |
| | | | | 30 – 40 | 42.40 | 5 | 23.384 | 47.00 | 546.800 |
| | | | | 40 – 50 | 31.82 | 11 | 18.154 | 23.00 | 329.564 |
| | | | | 50 – 60 | 27.80 | 10 | 21.070 | 22.50 | 443.956 |
| | | | | 60 – 70 | 56.40 | 5 | 14.293 | 60.00 | 204.300 |
| | | | | > 70 | 68.00 | 1 | . | 68.00 | . |
| | | | | Total | 37.22 | 36 | 21.273 | 36.00 | 452.521 |
| | | | Christian | 40 – 50 | 48.00 | 1 | . | 48.00 | . |
| | | | | Total | 48.00 | 1 | . | 48.00 | . |
| | | | Total | 20 – 30 | 38.63 | 24 | 25.336 | 42.50 | 641.897 |
| | | | | 30 – 40 | 34.22 | 77 | 20.662 | 26.00 | 426.911 |
| | | | | 40 – 50 | 78.24 | 135 | 519.021 | 32.00 | 269382.869 |
| | | | | 50 – 60 | 32.85 | 160 | 18.746 | 33.00 | 351.399 |
| | | | | 60 – 70 | 38.49 | 101 | 18.030 | 36.00 | 325.092 |
| | | | | > 70 | 40.60 | 50 | 18.847 | 39.00 | 355.224 |
| | | | | Total | 46.25 | 547 | 258.331 | 34.00 | 66735.131 |
| | | Widowed | Hindu | 30 – 40 | 28.00 | 1 | . | 28.00 | . |
| | | | | 40 – 50 | 47.00 | 1 | . | 47.00 | . |
| | | | | 50 – 60 | 57.50 | 2 | 14.849 | 57.50 | 220.500 |
| | | | | 60 – 70 | 35.50 | 4 | 9.539 | 34.50 | 91.000 |
| | | | | > 70 | 43.80 | 5 | 21.833 | 47.00 | 476.700 |
| | | | | Total | 42.38 | 13 | 16.546 | 47.00 | 273.756 |
| | | | Total | 30 – 40 | 28.00 | 1 | . | 28.00 | . |
| | | | | 40 – 50 | 47.00 | 1 | . | 47.00 | . |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 50 – 60 | 57.50 | 2 | 14.849 | 57.50 | 220.500 |
| | | | | 60 – 70 | 35.50 | 4 | 9.539 | 34.50 | 91.000 |
| | | | | > 70 | 43.80 | 5 | 21.833 | 47.00 | 476.700 |
| | | | | Total | 42.38 | 13 | 16.546 | 47.00 | 273.756 |
| | | Divorced | Hindu | 40 – 50 | 29.00 | 1 | . | 29.00 | . |
| | | | | Total | 29.00 | 1 | . | 29.00 | . |
| | | | Total | 40 – 50 | 29.00 | 1 | . | 29.00 | . |
| | | | | Total | 29.00 | 1 | . | 29.00 | . |
| | | Total | Hindu | < 20 | 25.25 | 24 | 20.063 | 18.50 | 402.543 |
| | | | | 20 – 30 | 34.82 | 28 | 25.294 | 24.00 | 639.782 |
| | | | | 30 – 40 | 33.32 | 74 | 20.364 | 25.50 | 414.688 |
| | | | | 40 – 50 | 80.62 | 129 | 530.908 | 33.00 | 281863.175 |
| | | | | 50 – 60 | 33.47 | 153 | 18.677 | 33.00 | 348.830 |
| | | | | 60 – 70 | 37.63 | 101 | 17.482 | 36.00 | 305.634 |
| | | | | > 70 | 40.39 | 54 | 18.739 | 39.00 | 351.148 |
| | | | | Total | 45.38 | 563 | 254.673 | 33.00 | 64858.357 |
| | | | Muslim | < 20 | 26.50 | 2 | 17.678 | 26.50 | 312.500 |
| | | | | 20 – 30 | 34.00 | 5 | 20.359 | 37.00 | 414.500 |
| | | | | 30 – 40 | 42.40 | 5 | 23.384 | 47.00 | 546.800 |
| | | | | 40 – 50 | 31.82 | 11 | 18.154 | 23.00 | 329.564 |
| | | | | 50 – 60 | 27.80 | 10 | 21.070 | 22.50 | 443.956 |
| | | | | 60 – 70 | 56.40 | 5 | 14.293 | 60.00 | 204.300 |
| | | | | > 70 | 68.00 | 1 | . | 68.00 | . |
| | | | | Total | 36.23 | 39 | 20.925 | 36.00 | 437.866 |
| | | | Christian | 40 – 50 | 48.00 | 1 | . | 48.00 | . |
| | | | | Total | 48.00 | 1 | . | 48.00 | . |
| | | | Total | < 20 | 25.35 | 26 | 19.569 | 18.50 | 382.955 |
| | | | | 20 – 30 | 34.70 | 33 | 24.325 | 26.00 | 591.718 |
| | | | | 30 – 40 | 33.90 | 79 | 20.521 | 26.00 | 421.092 |
| | | | | 40 – 50 | 76.58 | 141 | 507.844 | 33.00 | 257905.317 |
| | | | | 50 – 60 | 33.12 | 163 | 18.810 | 33.00 | 353.824 |
| | | | | 60 – 70 | 38.52 | 106 | 17.744 | 36.00 | 314.842 |
| | | | | > 70 | 40.89 | 55 | 18.934 | 40.00 | 358.506 |
| | | | | Total | 44.79 | 603 | 246.133 | 33.00 | 60581.562 |
| Female | Gujarati | Unmarried | Hindu | < 20 | 26.22 | 9 | 16.917 | 20.00 | 286.194 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 20 – 30 | 51.00 | 3 | 32.909 | 70.00 | 1083.000 |
| | | | | 30 – 40 | 54.00 | 1 | . | 54.00 | . |
| | | | | 40 – 50 | 13.00 | 1 | . | 13.00 | . |
| | | | | 60 – 70 | 73.00 | 1 | . | 73.00 | . |
| | | | | Total | 35.27 | 15 | 24.209 | 32.00 | 586.067 |
| | | | Muslim | < 20 | 44.00 | 1 | . | 44.00 | . |
| | | | | Total | 44.00 | 1 | . | 44.00 | . |
| | | | Total | < 20 | 28.00 | 10 | 16.912 | 26.00 | 286.000 |
| | | | | 20 – 30 | 51.00 | 3 | 32.909 | 70.00 | 1083.000 |
| | | | | 30 – 40 | 54.00 | 1 | . | 54.00 | . |
| | | | | 40 – 50 | 13.00 | 1 | . | 13.00 | . |
| | | | | 60 – 70 | 73.00 | 1 | . | 73.00 | . |
| | | | | Total | 35.81 | 16 | 23.490 | 35.50 | 551.763 |
| | | Married | Hindu | 20 – 30 | 25.86 | 14 | 16.801 | 19.50 | 282.286 |
| | | | | 30 – 40 | 20.72 | 53 | 13.939 | 17.00 | 194.284 |
| | | | | 40 – 50 | 26.99 | 79 | 19.734 | 17.00 | 389.449 |
| | | | | 50 – 60 | 28.22 | 60 | 18.595 | 19.50 | 345.766 |
| | | | | 60 – 70 | 30.17 | 24 | 17.402 | 27.50 | 302.841 |
| | | | | > 70 | 27.50 | 4 | 20.091 | 20.00 | 403.667 |
| | | | | Total | 26.15 | 234 | 17.941 | 17.00 | 321.879 |
| | | | Muslim | 20 – 30 | 41.50 | 2 | 40.305 | 41.50 | 1624.500 |
| | | | | 30 – 40 | 13.67 | 3 | 1.155 | 13.00 | 1.333 |
| | | | | 40 – 50 | 25.91 | 11 | 21.178 | 15.00 | 448.491 |
| | | | | 50 – 60 | 13.00 | 1 | . | 13.00 | . |
| | | | | 60 – 70 | 13.00 | 2 | .000 | 13.00 | .000 |
| | | | | > 70 | 5.00 | 1 | . | 5.00 | . |
| | | | | Total | 22.65 | 20 | 20.226 | 13.00 | 409.082 |
| | | | Sikh | 30 – 40 | 65.00 | 1 | . | 65.00 | . |
| | | | | Total | 65.00 | 1 | . | 65.00 | . |
| | | | Christian | 60 – 70 | 17.00 | 1 | . | 17.00 | . |
| | | | | Total | 17.00 | 1 | . | 17.00 | . |
| | | | Total | 20 – 30 | 27.81 | 16 | 19.532 | 19.50 | 381.496 |
| | | | | 30 – 40 | 21.12 | 57 | 14.764 | 17.00 | 217.967 |
| | | | | 40 – 50 | 26.86 | 90 | 19.795 | 17.00 | 391.833 |
| | | | | 50 – 60 | 27.97 | 61 | 18.542 | 18.00 | 343.799 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 60 – 70 | 28.41 | 27 | 17.147 | 23.00 | 294.020 |
| | | | | > 70 | 23.00 | 5 | 20.100 | 17.00 | 404.000 |
| | | | | Total | 25.99 | 256 | 18.215 | 17.00 | 331.772 |
| | | Widowed | Hindu | 30 – 40 | 23.67 | 3 | 5.859 | 26.00 | 34.333 |
| | | | | 40 – 50 | 31.85 | 13 | 21.181 | 23.00 | 448.641 |
| | | | | 50 – 60 | 25.64 | 14 | 17.679 | 17.00 | 312.555 |
| | | | | 60 – 70 | 24.64 | 11 | 17.287 | 17.00 | 298.855 |
| | | | | > 70 | 29.63 | 8 | 22.174 | 19.00 | 491.696 |
| | | | | Total | 27.59 | 49 | 18.490 | 17.00 | 341.872 |
| | | | Muslim | 30 – 40 | 51.00 | 1 | . | 51.00 | . |
| | | | | 40 – 50 | 27.00 | 1 | . | 27.00 | . |
| | | | | 60 – 70 | 52.00 | 2 | 28.284 | 52.00 | 800.000 |
| | | | | > 70 | 49.00 | 2 | 15.556 | 49.00 | 242.000 |
| | | | | Total | 46.67 | 6 | 17.409 | 44.50 | 303.067 |
| | | | Total | 30 – 40 | 30.50 | 4 | 14.480 | 27.00 | 209.667 |
| | | | | 40 – 50 | 31.50 | 14 | 20.391 | 25.00 | 415.808 |
| | | | | 50 – 60 | 25.64 | 14 | 17.679 | 17.00 | 312.555 |
| | | | | 60 – 70 | 28.85 | 13 | 20.526 | 21.00 | 421.308 |
| | | | | > 70 | 33.50 | 10 | 21.819 | 28.50 | 476.056 |
| | | | | Total | 29.67 | 55 | 19.182 | 21.00 | 367.965 |
| | | Divorced | Hindu | 20 – 30 | 73.00 | 1 | . | 73.00 | . |
| | | | | 30 – 40 | 28.50 | 2 | 21.920 | 28.50 | 480.500 |
| | | | | Total | 43.33 | 3 | 30.006 | 44.00 | 900.333 |
| | | | Total | 20 – 30 | 73.00 | 1 | . | 73.00 | . |
| | | | | 30 – 40 | 28.50 | 2 | 21.920 | 28.50 | 480.500 |
| | | | | Total | 43.33 | 3 | 30.006 | 44.00 | 900.333 |
| | | Total | Hindu | < 20 | 26.22 | 9 | 16.917 | 20.00 | 286.194 |
| | | | | 20 – 30 | 32.67 | 18 | 23.162 | 24.00 | 536.471 |
| | | | | 30 – 40 | 21.69 | 59 | 14.294 | 17.00 | 204.319 |
| | | | | 40 – 50 | 27.52 | 93 | 19.846 | 17.00 | 393.883 |
| | | | | 50 – 60 | 27.73 | 74 | 18.334 | 17.00 | 336.145 |
| | | | | 60 – 70 | 29.67 | 36 | 18.606 | 23.00 | 346.171 |
| | | | | > 70 | 28.92 | 12 | 20.593 | 19.00 | 424.083 |
| | | | | Total | 27.01 | 301 | 18.567 | 17.00 | 344.750 |
| | | | Muslim | < 20 | 44.00 | 1 | . | 44.00 | . |
| | | | | 20 – 30 | 41.50 | 2 | 40.305 | 41.50 | 1624.500 |
| | | | | 30 – 40 | 23.00 | 4 | 18.690 | 14.00 | 349.333 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 40 – 50 | 26.00 | 12 | 20.195 | 16.00 | 407.818 |
| | | | | 50 – 60 | 13.00 | 1 | . | 13.00 | . |
| | | | | 60 – 70 | 32.50 | 4 | 27.815 | 22.50 | 773.667 |
| | | | | > 70 | 34.33 | 3 | 27.683 | 38.00 | 766.333 |
| | | | | Total | 28.78 | 27 | 21.653 | 15.00 | 468.872 |
| | | | Sikh | 30 – 40 | 65.00 | 1 | . | 65.00 | . |
| | | | | Total | 65.00 | 1 | . | 65.00 | . |
| | | | Christian | 60 – 70 | 17.00 | 1 | . | 17.00 | . |
| | | | | Total | 17.00 | 1 | . | 17.00 | . |
| | | | Total | < 20 | 28.00 | 10 | 16.912 | 26.00 | 286.000 |
| | | | | 20 – 30 | 33.55 | 20 | 23.935 | 24.00 | 572.892 |
| | | | | 30 – 40 | 22.45 | 64 | 15.298 | 17.00 | 234.030 |
| | | | | 40 – 50 | 27.34 | 105 | 19.794 | 17.00 | 391.804 |
| | | | | 50 – 60 | 27.53 | 75 | 18.289 | 17.00 | 334.495 |
| | | | | 60 – 70 | 29.63 | 41 | 19.124 | 23.00 | 365.738 |
| | | | | > 70 | 30.00 | 15 | 21.159 | 21.00 | 447.714 |
| | | | | Total | 27.24 | 330 | 18.876 | 17.00 | 356.310 |
| | Hindi | Unmarried | Hindu | < 20 | 13.00 | 2 | 12.728 | 13.00 | 162.000 |
| | | | | 40 – 50 | 54.00 | 1 | . | 54.00 | . |
| | | | | 50 – 60 | 13.00 | 1 | . | 13.00 | . |
| | | | | Total | 23.25 | 4 | 21.777 | 17.50 | 474.250 |
| | | | Total | < 20 | 13.00 | 2 | 12.728 | 13.00 | 162.000 |
| | | | | 40 – 50 | 54.00 | 1 | . | 54.00 | . |
| | | | | 50 – 60 | 13.00 | 1 | . | 13.00 | . |
| | | | | Total | 23.25 | 4 | 21.777 | 17.50 | 474.250 |
| | | Married | Hindu | 20 – 30 | 24.67 | 3 | 19.348 | 14.00 | 374.333 |
| | | | | 30 – 40 | 45.91 | 11 | 20.584 | 44.00 | 423.691 |
| | | | | 40 – 50 | 22.38 | 13 | 14.655 | 17.00 | 214.756 |
| | | | | 50 – 60 | 23.20 | 15 | 15.974 | 17.00 | 255.171 |
| | | | | 60 – 70 | 27.57 | 7 | 14.741 | 21.00 | 217.286 |
| | | | | > 70 | 37.00 | 1 | . | 37.00 | . |
| | | | | Total | 28.96 | 50 | 18.512 | 17.00 | 342.692 |
| | | | Muslim | 40 – 50 | 48.00 | 1 | . | 48.00 | . |
| | | | | 50 – 60 | 13.00 | 1 | . | 13.00 | . |
| | | | | Total | 30.50 | 2 | 24.749 | 30.50 | 612.500 |
| | | | Total | 20 – 30 | 24.67 | 3 | 19.348 | 14.00 | 374.333 |
| | | | | 30 – 40 | 45.91 | 11 | 20.584 | 44.00 | 423.691 |
| | | | | 40 – 50 | 24.21 | 14 | 15.656 | 17.00 | 245.104 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 50 – 60 | 22.56 | 16 | 15.642 | 17.00 | 244.663 |
| | | | | 60 – 70 | 27.57 | 7 | 14.741 | 21.00 | 217.286 |
| | | | | > 70 | 37.00 | 1 | . | 37.00 | . |
| | | | | Total | 29.02 | 52 | 18.476 | 17.00 | 341.353 |
| | | Widowed | Hindu | 50 – 60 | 29.60 | 5 | 24.079 | 23.00 | 579.800 |
| | | | | 60 – 70 | 44.75 | 4 | 22.824 | 45.00 | 520.917 |
| | | | | > 70 | 57.00 | 1 | . | 57.00 | . |
| | | | | Total | 38.40 | 10 | 23.037 | 31.50 | 530.711 |
| | | | Total | 50 – 60 | 29.60 | 5 | 24.079 | 23.00 | 579.800 |
| | | | | 60 – 70 | 44.75 | 4 | 22.824 | 45.00 | 520.917 |
| | | | | > 70 | 57.00 | 1 | . | 57.00 | . |
| | | | | Total | 38.40 | 10 | 23.037 | 31.50 | 530.711 |
| | | Divorced | Hindu | 20 – 30 | 22.00 | 1 | . | 22.00 | . |
| | | | | Total | 22.00 | 1 | . | 22.00 | . |
| | | | Total | 20 – 30 | 22.00 | 1 | . | 22.00 | . |
| | | | | Total | 22.00 | 1 | . | 22.00 | . |
| | | Total | Hindu | < 20 | 13.00 | 2 | 12.728 | 13.00 | 162.000 |
| | | | | 20 – 30 | 24.00 | 4 | 15.853 | 18.00 | 251.333 |
| | | | | 30 – 40 | 45.91 | 11 | 20.584 | 44.00 | 423.691 |
| | | | | 40 – 50 | 24.64 | 14 | 16.420 | 17.00 | 269.632 |
| | | | | 50 – 60 | 24.24 | 21 | 17.575 | 17.00 | 308.890 |
| | | | | 60 – 70 | 33.82 | 11 | 19.020 | 35.00 | 361.764 |
| | | | | > 70 | 47.00 | 2 | 14.142 | 47.00 | 200.000 |
| | | | | Total | 29.95 | 65 | 19.364 | 21.00 | 374.951 |
| | | | Muslim | 40 – 50 | 48.00 | 1 | . | 48.00 | . |
| | | | | 50 – 60 | 13.00 | 1 | . | 13.00 | . |
| | | | | Total | 30.50 | 2 | 24.749 | 30.50 | 612.500 |
| | | | Total | < 20 | 13.00 | 2 | 12.728 | 13.00 | 162.000 |
| | | | | 20 – 30 | 24.00 | 4 | 15.853 | 18.00 | 251.333 |
| | | | | 30 – 40 | 45.91 | 11 | 20.584 | 44.00 | 423.691 |
| | | | | 40 – 50 | 26.20 | 15 | 16.933 | 17.00 | 286.743 |
| | | | | 50 – 60 | 23.73 | 22 | 17.318 | 17.00 | 299.922 |
| | | | | 60 – 70 | 33.82 | 11 | 19.020 | 35.00 | 361.764 |
| | | | | > 70 | 47.00 | 2 | 14.142 | 47.00 | 200.000 |
| | | | | Total | 29.97 | 67 | 19.310 | 21.00 | 372.878 |
| | Other | Unmarried | Hindu | < 20 | 14.00 | 1 | . | 14.00 | . |
| | | | | Total | 14.00 | 1 | . | 14.00 | . |
| | | | Total | < 20 | 14.00 | 1 | . | 14.00 | . |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | **Total** | **14.00** | **1** | **.** | **14.00** | **.** |
| | | **Married** | **Hindu** | **20 – 30** | **13.00** | **1** | **.** | **13.00** | **.** |
| | | | | **30 – 40** | **13.00** | **1** | **.** | **13.00** | **.** |
| | | | | **40 – 50** | **13.00** | **1** | **.** | **13.00** | **.** |
| | | | | **50 – 60** | **38.00** | **2** | **29.698** | **38.00** | **882.000** |
| | | | | **Total** | **23.00** | **5** | **20.199** | **13.00** | **408.000** |
| | | | **Muslim** | **30 – 40** | **68.00** | **1** | **.** | **68.00** | **.** |
| | | | | **Total** | **68.00** | **1** | **.** | **68.00** | **.** |
| | | | **Total** | **20 – 30** | **13.00** | **1** | **.** | **13.00** | **.** |
| | | | | **30 – 40** | **40.50** | **2** | **38.891** | **40.50** | **1512.500** |
| | | | | **40 – 50** | **13.00** | **1** | **.** | **13.00** | **.** |
| | | | | **50 – 60** | **38.00** | **2** | **29.698** | **38.00** | **882.000** |
| | | | | **Total** | **30.50** | **6** | **25.766** | **15.00** | **663.900** |
| | | **Widowed** | **Hindu** | **60 – 70** | **14.00** | **1** | **.** | **14.00** | **.** |
| | | | | **Total** | **14.00** | **1** | **.** | **14.00** | **.** |
| | | | **Jain** | **40 – 50** | **68.00** | **1** | **.** | **68.00** | **.** |
| | | | | **Total** | **68.00** | **1** | **.** | **68.00** | **.** |
| | | | **Total** | **40 – 50** | **68.00** | **1** | **.** | **68.00** | **.** |
| | | | | **60 – 70** | **14.00** | **1** | **.** | **14.00** | **.** |
| | | | | **Total** | **41.00** | **2** | **38.184** | **41.00** | **1458.000** |
| | | **Total** | **Hindu** | **< 20** | **14.00** | **1** | **.** | **14.00** | **.** |
| | | | | **20 – 30** | **13.00** | **1** | **.** | **13.00** | **.** |
| | | | | **30 – 40** | **13.00** | **1** | **.** | **13.00** | **.** |
| | | | | **40 – 50** | **13.00** | **1** | **.** | **13.00** | **.** |
| | | | | **50 – 60** | **38.00** | **2** | **29.698** | **38.00** | **882.000** |
| | | | | **60 – 70** | **14.00** | **1** | **.** | **14.00** | **.** |
| | | | | **Total** | **20.43** | **7** | **17.067** | **14.00** | **291.286** |
| | | | **Muslim** | **30 – 40** | **68.00** | **1** | **.** | **68.00** | **.** |
| | | | | **Total** | **68.00** | **1** | **.** | **68.00** | **.** |
| | | | **Jain** | **40 – 50** | **68.00** | **1** | **.** | **68.00** | **.** |
| | | | | **Total** | **68.00** | **1** | **.** | **68.00** | **.** |
| | | | **Total** | **< 20** | **14.00** | **1** | **.** | **14.00** | **.** |
| | | | | **20 – 30** | **13.00** | **1** | **.** | **13.00** | **.** |
| | | | | **30 – 40** | **40.50** | **2** | **38.891** | **40.50** | **1512.500** |
| | | | | **40 – 50** | **40.50** | **2** | **38.891** | **40.50** | **1512.500** |
| | | | | **50 – 60** | **38.00** | **2** | **29.698** | **38.00** | **882.000** |
| | | | | **60 – 70** | **14.00** | **1** | **.** | **14.00** | **.** |
| | | | | **Total** | **31.00** | **9** | **25.661** | **14.00** | **658.500** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total | Unmarried | Hindu | < 20 | 23.00 | 12 | 16.028 | 17.00 | 256.909 |
| | | | | 20 – 30 | 51.00 | 3 | 32.909 | 70.00 | 1083.000 |
| | | | | 30 – 40 | 54.00 | 1 | . | 54.00 | . |
| | | | | 40 – 50 | 33.50 | 2 | 28.991 | 33.50 | 840.500 |
| | | | | 50 – 60 | 13.00 | 1 | . | 13.00 | . |
| | | | | 60 – 70 | 73.00 | 1 | . | 73.00 | . |
| | | | | Total | 31.80 | 20 | 23.415 | 21.00 | 548.274 |
| | | | Muslim | < 20 | 44.00 | 1 | . | 44.00 | . |
| | | | | Total | 44.00 | 1 | . | 44.00 | . |
| | | | Total | < 20 | 24.62 | 13 | 16.414 | 20.00 | 269.423 |
| | | | | 20 – 30 | 51.00 | 3 | 32.909 | 70.00 | 1083.000 |
| | | | | 30 – 40 | 54.00 | 1 | . | 54.00 | . |
| | | | | 40 – 50 | 33.50 | 2 | 28.991 | 33.50 | 840.500 |
| | | | | 50 – 60 | 13.00 | 1 | . | 13.00 | . |
| | | | | 60 – 70 | 73.00 | 1 | . | 73.00 | . |
| | | | | Total | 32.38 | 21 | 22.977 | 22.00 | 527.948 |
| | | Married | Hindu | 20 – 30 | 24.94 | 18 | 16.401 | 17.00 | 268.997 |
| | | | | 30 – 40 | 24.86 | 65 | 17.794 | 17.00 | 316.621 |
| | | | | 40 – 50 | 26.19 | 93 | 19.044 | 17.00 | 362.680 |
| | | | | 50 – 60 | 27.49 | 77 | 18.275 | 17.00 | 333.990 |
| | | | | 60 – 70 | 29.58 | 31 | 16.639 | 27.00 | 276.852 |
| | | | | > 70 | 29.40 | 5 | 17.911 | 23.00 | 320.800 |
| | | | | Total | 26.58 | 289 | 18.048 | 17.00 | 325.737 |
| | | | Muslim | 20 – 30 | 41.50 | 2 | 40.305 | 41.50 | 1624.500 |
| | | | | 30 – 40 | 27.25 | 4 | 27.183 | 14.00 | 738.917 |
| | | | | 40 – 50 | 27.75 | 12 | 21.175 | 16.00 | 448.386 |
| | | | | 50 – 60 | 13.00 | 2 | .000 | 13.00 | .000 |
| | | | | 60 – 70 | 13.00 | 2 | .000 | 13.00 | .000 |
| | | | | > 70 | 5.00 | 1 | . | 5.00 | . |
| | | | | Total | 25.30 | 23 | 21.745 | 13.00 | 472.858 |
| | | | Sikh | 30 – 40 | 65.00 | 1 | . | 65.00 | . |
| | | | | Total | 65.00 | 1 | . | 65.00 | . |
| | | | Christian | 60 – 70 | 17.00 | 1 | . | 17.00 | . |
| | | | | Total | 17.00 | 1 | . | 17.00 | . |
| | | | Total | 20 – 30 | 26.60 | 20 | 18.766 | 17.00 | 352.147 |
| | | | | 30 – 40 | 25.57 | 70 | 18.681 | 17.00 | 348.973 |
| | | | | 40 – 50 | 26.37 | 105 | 19.196 | 17.00 | 368.505 |
| | | | | 50 – 60 | 27.13 | 79 | 18.185 | 17.00 | 330.676 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 60 – 70 | 28.24 | 34 | 16.470 | 22.00 | 271.276 |
| | | | | > 70 | 25.33 | 6 | 18.864 | 20.00 | 355.867 |
| | | | | Total | 26.58 | 314 | 18.387 | 17.00 | 338.085 |
| | | Widowed | Hindu | 30 – 40 | 23.67 | 3 | 5.859 | 26.00 | 34.333 |
| | | | | 40 – 50 | 31.85 | 13 | 21.181 | 23.00 | 448.641 |
| | | | | 50 – 60 | 26.68 | 19 | 18.915 | 17.00 | 357.784 |
| | | | | 60 – 70 | 29.00 | 16 | 19.963 | 19.00 | 398.533 |
| | | | | > 70 | 32.67 | 9 | 22.661 | 21.00 | 513.500 |
| | | | | Total | 29.17 | 60 | 19.481 | 17.00 | 379.497 |
| | | | Muslim | 30 – 40 | 51.00 | 1 | . | 51.00 | . |
| | | | | 40 – 50 | 27.00 | 1 | . | 27.00 | . |
| | | | | 60 – 70 | 52.00 | 2 | 28.284 | 52.00 | 800.000 |
| | | | | > 70 | 49.00 | 2 | 15.556 | 49.00 | 242.000 |
| | | | | Total | 46.67 | 6 | 17.409 | 44.50 | 303.067 |
| | | | Jain | 40 – 50 | 68.00 | 1 | . | 68.00 | . |
| | | | | Total | 68.00 | 1 | . | 68.00 | . |
| | | | Total | 30 – 40 | 30.50 | 4 | 14.480 | 27.00 | 209.667 |
| | | | | 40 – 50 | 33.93 | 15 | 21.793 | 27.00 | 474.924 |
| | | | | 50 – 60 | 26.68 | 19 | 18.915 | 17.00 | 357.784 |
| | | | | 60 – 70 | 31.56 | 18 | 21.308 | 22.00 | 454.026 |
| | | | | > 70 | 35.64 | 11 | 21.878 | 36.00 | 478.655 |
| | | | | Total | 31.31 | 67 | 20.204 | 23.00 | 408.218 |
| | | Divorced | Hindu | 20 – 30 | 47.50 | 2 | 36.062 | 47.50 | 1300.500 |
| | | | | 30 – 40 | 28.50 | 2 | 21.920 | 28.50 | 480.500 |
| | | | | Total | 38.00 | 4 | 26.721 | 33.00 | 714.000 |
| | | | Total | 20 – 30 | 47.50 | 2 | 36.062 | 47.50 | 1300.500 |
| | | | | 30 – 40 | 28.50 | 2 | 21.920 | 28.50 | 480.500 |
| | | | | Total | 38.00 | 4 | 26.721 | 33.00 | 714.000 |
| | | Total | Hindu | < 20 | 23.00 | 12 | 16.028 | 17.00 | 256.909 |
| | | | | 20 – 30 | 30.30 | 23 | 21.777 | 22.00 | 474.221 |
| | | | | 30 – 40 | 25.32 | 71 | 17.598 | 17.00 | 309.679 |
| | | | | 40 – 50 | 27.01 | 108 | 19.345 | 17.00 | 374.215 |
| | | | | 50 – 60 | 27.19 | 97 | 18.268 | 17.00 | 333.715 |
| | | | | 60 – 70 | 30.29 | 48 | 18.537 | 23.00 | 343.615 |
| | | | | > 70 | 31.50 | 14 | 20.429 | 22.00 | 417.346 |
| | | | | Total | 27.40 | 373 | 18.692 | 17.00 | 349.407 |
| | | | Muslim | < 20 | 44.00 | 1 | . | 44.00 | . |
| | | | | 20 – 30 | 41.50 | 2 | 40.305 | 41.50 | 1624.500 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 30 – 40 | 32.00 | 5 | 25.826 | 15.00 | 667.000 |
| | | | | 40 – 50 | 27.69 | 13 | 20.275 | 17.00 | 411.064 |
| | | | | 50 – 60 | 13.00 | 2 | .000 | 13.00 | .000 |
| | | | | 60 – 70 | 32.50 | 4 | 27.815 | 22.50 | 773.667 |
| | | | | > 70 | 34.33 | 3 | 27.683 | 38.00 | 766.333 |
| | | | | Total | 30.20 | 30 | 22.196 | 16.00 | 492.648 |
| | | | Jain | 40 – 50 | 68.00 | 1 | . | 68.00 | . |
| | | | | Total | 68.00 | 1 | . | 68.00 | . |
| | | | Sikh | 30 – 40 | 65.00 | 1 | . | 65.00 | . |
| | | | | Total | 65.00 | 1 | . | 65.00 | . |
| | | | Christian | 60 – 70 | 17.00 | 1 | . | 17.00 | . |
| | | | | Total | 17.00 | 1 | . | 17.00 | . |
| | | | Total | < 20 | 24.62 | 13 | 16.414 | 20.00 | 269.423 |
| | | | | 20 – 30 | 31.20 | 25 | 22.627 | 22.00 | 512.000 |
| | | | | 30 – 40 | 26.27 | 77 | 18.522 | 17.00 | 343.069 |
| | | | | 40 – 50 | 27.42 | 122 | 19.633 | 17.00 | 385.452 |
| | | | | 50 – 60 | 26.90 | 99 | 18.191 | 17.00 | 330.928 |
| | | | | 60 – 70 | 30.21 | 53 | 18.947 | 23.00 | 358.975 |
| | | | | > 70 | 32.00 | 17 | 20.884 | 23.00 | 436.125 |
| | | | | Total | 27.77 | 406 | 19.091 | 17.00 | 364.482 |
| Total | Gujarati | Unmarried | Hindu | < 20 | 25.83 | 30 | 19.370 | 20.00 | 375.178 |
| | | | | 20 – 30 | 33.70 | 10 | 26.056 | 18.50 | 678.900 |
| | | | | 30 – 40 | 34.50 | 2 | 27.577 | 34.50 | 760.500 |
| | | | | 40 – 50 | 34.50 | 4 | 19.672 | 32.50 | 387.000 |
| | | | | 50 – 60 | 28.00 | 1 | . | 28.00 | . |
| | | | | 60 – 70 | 63.50 | 2 | 13.435 | 63.50 | 180.500 |
| | | | | Total | 30.08 | 49 | 21.467 | 24.00 | 460.827 |
| | | | Muslim | < 20 | 32.33 | 3 | 16.073 | 39.00 | 258.333 |
| | | | | 20 – 30 | 20.00 | 1 | . | 20.00 | . |
| | | | | Total | 29.25 | 4 | 14.500 | 29.50 | 210.250 |
| | | | Total | < 20 | 26.42 | 33 | 18.967 | 20.00 | 359.752 |
| | | | | 20 – 30 | 32.45 | 11 | 25.061 | 20.00 | 628.073 |
| | | | | 30 – 40 | 34.50 | 2 | 27.577 | 34.50 | 760.500 |
| | | | | 40 – 50 | 34.50 | 4 | 19.672 | 32.50 | 387.000 |
| | | | | 50 – 60 | 28.00 | 1 | . | 28.00 | . |
| | | | | 60 – 70 | 63.50 | 2 | 13.435 | 63.50 | 180.500 |
| | | | | Total | 30.02 | 53 | 20.918 | 24.00 | 437.557 |
| | | Married | Hindu | 20 – 30 | 33.29 | 28 | 22.077 | 26.00 | 487.397 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 30 – 40 | 27.80 | 112 | 18.773 | 17.00 | 352.412 |
| | | | | 40 – 50 | 63.07 | 188 | 440.150 | 26.00 | 193731.962 |
| | | | | 50 – 60 | 31.33 | 183 | 18.798 | 26.00 | 353.353 |
| | | | | 60 – 70 | 35.71 | 95 | 17.970 | 33.00 | 322.912 |
| | | | | > 70 | 39.53 | 36 | 19.502 | 37.00 | 380.313 |
| | | | | Total | 41.20 | 642 | 238.694 | 26.00 | 56974.639 |
| | | | Muslim | 20 – 30 | 39.20 | 5 | 27.635 | 52.00 | 763.700 |
| | | | | 30 – 40 | 31.63 | 8 | 23.108 | 19.00 | 533.982 |
| | | | | 40 – 50 | 28.60 | 20 | 19.752 | 21.00 | 390.147 |
| | | | | 50 – 60 | 26.45 | 11 | 20.481 | 22.00 | 419.473 |
| | | | | 60 – 70 | 44.00 | 7 | 24.180 | 48.00 | 584.667 |
| | | | | > 70 | 5.00 | 1 | . | 5.00 | . |
| | | | | Total | 31.25 | 52 | 21.894 | 23.00 | 479.328 |
| | | | Sikh | 30 – 40 | 65.00 | 1 | . | 65.00 | . |
| | | | | Total | 65.00 | 1 | . | 65.00 | . |
| | | | Christian | 40 – 50 | 48.00 | 1 | . | 48.00 | . |
| | | | | 60 – 70 | 17.00 | 1 | . | 17.00 | . |
| | | | | Total | 32.50 | 2 | 21.920 | 32.50 | 480.500 |
| | | | Total | 20 – 30 | 34.18 | 33 | 22.613 | 26.00 | 511.341 |
| | | | | 30 – 40 | 28.36 | 121 | 19.218 | 17.00 | 369.317 |
| | | | | 40 – 50 | 59.70 | 209 | 417.507 | 23.00 | 174312.075 |
| | | | | 50 – 60 | 31.05 | 194 | 18.874 | 26.00 | 356.225 |
| | | | | 60 – 70 | 36.09 | 103 | 18.439 | 33.00 | 339.982 |
| | | | | > 70 | 38.59 | 37 | 20.049 | 36.00 | 401.970 |
| | | | | Total | 40.47 | 697 | 229.164 | 26.00 | 52516.040 |
| | | Widowed | Hindu | 30 – 40 | 24.75 | 4 | 5.252 | 27.00 | 27.583 |
| | | | | 40 – 50 | 32.93 | 14 | 20.749 | 25.50 | 430.533 |
| | | | | 50 – 60 | 29.63 | 16 | 20.099 | 17.00 | 403.983 |
| | | | | 60 – 70 | 27.53 | 15 | 16.053 | 23.00 | 257.695 |
| | | | | > 70 | 35.08 | 13 | 22.299 | 36.00 | 497.244 |
| | | | | Total | 30.69 | 62 | 18.966 | 23.00 | 359.724 |
| | | | Muslim | 30 – 40 | 51.00 | 1 | . | 51.00 | . |
| | | | | 40 – 50 | 27.00 | 1 | . | 27.00 | . |
| | | | | 60 – 70 | 52.00 | 2 | 28.284 | 52.00 | 800.000 |
| | | | | > 70 | 49.00 | 2 | 15.556 | 49.00 | 242.000 |
| | | | | Total | 46.67 | 6 | 17.409 | 44.50 | 303.067 |
| | | | Total | 30 – 40 | 30.00 | 5 | 12.590 | 28.00 | 158.500 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 40 – 50 | 32.53 | 15 | 20.053 | 27.00 | 402.124 |
| | | | | 50 – 60 | 29.63 | 16 | 20.099 | 17.00 | 403.983 |
| | | | | 60 – 70 | 30.41 | 17 | 18.480 | 25.00 | 341.507 |
| | | | | > 70 | 36.93 | 15 | 21.622 | 36.00 | 467.495 |
| | | | | Total | 32.10 | 68 | 19.260 | 25.50 | 370.959 |
| | | Divorced | Hindu | 20 – 30 | 73.00 | 1 | . | 73.00 | . |
| | | | | 30 – 40 | 28.50 | 2 | 21.920 | 28.50 | 480.500 |
| | | | | 40 – 50 | 29.00 | 1 | . | 29.00 | . |
| | | | | Total | 39.75 | 4 | 25.526 | 36.50 | 651.583 |
| | | | Total | 20 – 30 | 73.00 | 1 | . | 73.00 | . |
| | | | | 30 – 40 | 28.50 | 2 | 21.920 | 28.50 | 480.500 |
| | | | | 40 – 50 | 29.00 | 1 | . | 29.00 | . |
| | | | | Total | 39.75 | 4 | 25.526 | 36.50 | 651.583 |
| | | Total | Hindu | < 20 | 25.83 | 30 | 19.370 | 20.00 | 375.178 |
| | | | | 20 – 30 | 34.41 | 39 | 23.396 | 26.00 | 547.354 |
| | | | | 30 – 40 | 27.82 | 120 | 18.464 | 17.00 | 340.919 |
| | | | | 40 – 50 | 60.32 | 207 | 419.490 | 26.00 | 175971.908 |
| | | | | 50 – 60 | 31.17 | 200 | 18.812 | 26.00 | 353.884 |
| | | | | 60 – 70 | 35.11 | 112 | 18.171 | 33.00 | 330.169 |
| | | | | > 70 | 38.35 | 49 | 20.139 | 36.00 | 405.565 |
| | | | | Total | 39.61 | 757 | 219.962 | 26.00 | 48383.290 |
| | | | Muslim | < 20 | 32.33 | 3 | 16.073 | 39.00 | 258.333 |
| | | | | 20 – 30 | 36.00 | 6 | 25.931 | 36.00 | 672.400 |
| | | | | 30 – 40 | 33.78 | 9 | 22.560 | 23.00 | 508.944 |
| | | | | 40 – 50 | 28.52 | 21 | 19.255 | 23.00 | 370.762 |
| | | | | 50 – 60 | 26.45 | 11 | 20.481 | 22.00 | 419.473 |
| | | | | 60 – 70 | 45.78 | 9 | 23.472 | 48.00 | 550.944 |
| | | | | > 70 | 34.33 | 3 | 27.683 | 38.00 | 766.333 |
| | | | | Total | 32.61 | 62 | 21.394 | 23.00 | 457.684 |
| | | | Sikh | 30 – 40 | 65.00 | 1 | . | 65.00 | . |
| | | | | Total | 65.00 | 1 | . | 65.00 | . |
| | | | Christian | 40 – 50 | 48.00 | 1 | . | 48.00 | . |
| | | | | 60 – 70 | 17.00 | 1 | . | 17.00 | . |
| | | | | Total | 32.50 | 2 | 21.920 | 32.50 | 480.500 |
| | | | Total | < 20 | 26.42 | 33 | 18.967 | 20.00 | 359.752 |
| | | | | 20 – 30 | 34.62 | 45 | 23.440 | 26.00 | 549.422 |
| | | | | 30 – 40 | 28.52 | 130 | 18.941 | 17.00 | 358.748 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | 40 – 50 | 57.35 | 229 | 398.885 | 26.00 | 159109.605 |
| | | | | 50 – 60 | 30.93 | 211 | 18.879 | 26.00 | 356.428 |
| | | | | 60 – 70 | 35.75 | 122 | 18.710 | 33.00 | 350.075 |
| | | | | > 70 | 38.12 | 52 | 20.314 | 36.00 | 412.653 |
| | | | | Total | 39.10 | 822 | 211.167 | 26.00 | 44591.637 |
| | Hindi | Unmarried | Hindu | < 20 | 18.60 | 5 | 15.060 | 12.00 | 226.800 |
| | | | | 20 – 30 | 14.00 | 1 | . | 14.00 | . |
| | | | | 40 – 50 | 44.50 | 2 | 13.435 | 44.50 | 180.500 |
| | | | | 50 – 60 | 13.00 | 1 | . | 13.00 | . |
| | | | | Total | 23.22 | 9 | 16.917 | 14.00 | 286.194 |
| | | | Total | < 20 | 18.60 | 5 | 15.060 | 12.00 | 226.800 |
| | | | | 20 – 30 | 14.00 | 1 | . | 14.00 | . |
| | | | | 40 – 50 | 44.50 | 2 | 13.435 | 44.50 | 180.500 |
| | | | | 50 – 60 | 13.00 | 1 | . | 13.00 | . |
| | | | | Total | 23.22 | 9 | 16.917 | 14.00 | 286.194 |
| | | Married | Hindu | 20 – 30 | 31.22 | 9 | 27.793 | 14.00 | 772.444 |
| | | | | 30 – 40 | 38.80 | 20 | 22.505 | 40.50 | 506.484 |
| | | | | 40 – 50 | 27.50 | 26 | 18.155 | 18.00 | 329.620 |
| | | | | 50 – 60 | 29.43 | 40 | 17.580 | 23.00 | 309.071 |
| | | | | 60 – 70 | 34.93 | 30 | 17.854 | 36.00 | 318.754 |
| | | | | > 70 | 38.24 | 17 | 17.848 | 38.00 | 318.566 |
| | | | | Total | 32.73 | 142 | 19.389 | 34.00 | 375.917 |
| | | | Muslim | 20 – 30 | 37.00 | 1 | . | 37.00 | . |
| | | | | 40 – 50 | 37.00 | 3 | 19.053 | 48.00 | 363.000 |
| | | | | 50 – 60 | 13.00 | 1 | . | 13.00 | . |
| | | | | Total | 32.20 | 5 | 17.225 | 37.00 | 296.700 |
| | | | Total | 20 – 30 | 31.80 | 10 | 26.267 | 25.50 | 689.956 |
| | | | | 30 – 40 | 38.80 | 20 | 22.505 | 40.50 | 506.484 |
| | | | | 40 – 50 | 28.48 | 29 | 18.136 | 19.00 | 328.901 |
| | | | | 50 – 60 | 29.02 | 41 | 17.548 | 23.00 | 307.924 |
| | | | | 60 – 70 | 34.93 | 30 | 17.854 | 36.00 | 318.754 |
| | | | | > 70 | 38.24 | 17 | 17.848 | 38.00 | 318.566 |
| | | | | Total | 32.71 | 147 | 19.266 | 35.00 | 371.181 |
| | | Widowed | Hindu | 50 – 60 | 29.60 | 5 | 24.079 | 23.00 | 579.800 |
| | | | | 60 – 70 | 44.75 | 4 | 22.824 | 45.00 | 520.917 |
| | | | | > 70 | 57.00 | 1 | . | 57.00 | . |
| | | | | Total | 38.40 | 10 | 23.037 | 31.50 | 530.711 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | 50 – 60 | 29.60 | 5 | 24.079 | 23.00 | 579.800 |
| | | | | 60 – 70 | 44.75 | 4 | 22.824 | 45.00 | 520.917 |
| | | | | > 70 | 57.00 | 1 | . | 57.00 | . |
| | | | | Total | 38.40 | 10 | 23.037 | 31.50 | 530.711 |
| | | Divorced | Hindu | 20 – 30 | 22.00 | 1 | . | 22.00 | . |
| | | | | Total | 22.00 | 1 | . | 22.00 | . |
| | | | Total | 20 – 30 | 22.00 | 1 | . | 22.00 | . |
| | | | | Total | 22.00 | 1 | . | 22.00 | . |
| | | Total | Hindu | < 20 | 18.60 | 5 | 15.060 | 12.00 | 226.800 |
| | | | | 20 – 30 | 28.82 | 11 | 25.490 | 14.00 | 649.764 |
| | | | | 30 – 40 | 38.80 | 20 | 22.505 | 40.50 | 506.484 |
| | | | | 40 – 50 | 28.71 | 28 | 18.214 | 20.50 | 331.767 |
| | | | | 50 – 60 | 29.09 | 46 | 18.036 | 23.00 | 325.281 |
| | | | | 60 – 70 | 36.09 | 34 | 18.379 | 36.00 | 337.780 |
| | | | | > 70 | 39.28 | 18 | 17.871 | 41.50 | 319.389 |
| | | | | Total | 32.48 | 162 | 19.514 | 30.50 | 380.810 |
| | | | Muslim | 20 – 30 | 37.00 | 1 | . | 37.00 | . |
| | | | | 40 – 50 | 37.00 | 3 | 19.053 | 48.00 | 363.000 |
| | | | | 50 – 60 | 13.00 | 1 | . | 13.00 | . |
| | | | | Total | 32.20 | 5 | 17.225 | 37.00 | 296.700 |
| | | | Total | < 20 | 18.60 | 5 | 15.060 | 12.00 | 226.800 |
| | | | | 20 – 30 | 29.50 | 12 | 24.419 | 18.00 | 596.273 |
| | | | | 30 – 40 | 38.80 | 20 | 22.505 | 40.50 | 506.484 |
| | | | | 40 – 50 | 29.52 | 31 | 18.138 | 22.00 | 328.991 |
| | | | | 50 – 60 | 28.74 | 47 | 17.992 | 23.00 | 323.716 |
| | | | | 60 – 70 | 36.09 | 34 | 18.379 | 36.00 | 337.780 |
| | | | | > 70 | 39.28 | 18 | 17.871 | 41.50 | 319.389 |
| | | | | Total | 32.47 | 167 | 19.403 | 33.00 | 376.492 |
| | Other | Unmarried | Hindu | < 20 | 14.00 | 1 | . | 14.00 | . |
| | | | | Total | 14.00 | 1 | . | 14.00 | . |
| | | | Total | < 20 | 14.00 | 1 | . | 14.00 | . |
| | | | | Total | 14.00 | 1 | . | 14.00 | . |
| | | Married | Hindu | 20 – 30 | 13.00 | 1 | . | 13.00 | . |
| | | | | 30 – 40 | 29.80 | 5 | 22.421 | 25.00 | 502.700 |
| | | | | 40 – 50 | 13.50 | 2 | .707 | 13.50 | .500 |
| | | | | 50 – 60 | 46.25 | 4 | 20.320 | 53.50 | 412.917 |
| | | | | 60 – 70 | 41.00 | 2 | 11.314 | 41.00 | 128.000 |
| | | | | > 70 | 36.00 | 1 | . | 36.00 | . |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | Total | 32.80 | 15 | 19.691 | 32.00 | 387.743 |
| | | | Muslim | 30 – 40 | 68.00 | 1 | . | 68.00 | . |
| | | | | > 70 | 68.00 | 1 | . | 68.00 | . |
| | | | | Total | 68.00 | 2 | .000 | 68.00 | .000 |
| | | | Total | 20 – 30 | 13.00 | 1 | . | 13.00 | . |
| | | | | 30 – 40 | 36.17 | 6 | 25.404 | 28.50 | 645.367 |
| | | | | 40 – 50 | 13.50 | 2 | .707 | 13.50 | .500 |
| | | | | 50 – 60 | 46.25 | 4 | 20.320 | 53.50 | 412.917 |
| | | | | 60 – 70 | 41.00 | 2 | 11.314 | 41.00 | 128.000 |
| | | | | > 70 | 52.00 | 2 | 22.627 | 52.00 | 512.000 |
| | | | | Total | 36.94 | 17 | 21.816 | 33.00 | 475.934 |
| | | Widowed | Hindu | 60 – 70 | 14.00 | 1 | . | 14.00 | . |
| | | | | Total | 14.00 | 1 | . | 14.00 | . |
| | | | Jain | 40 – 50 | 68.00 | 1 | . | 68.00 | . |
| | | | | Total | 68.00 | 1 | . | 68.00 | . |
| | | | Total | 40 – 50 | 68.00 | 1 | . | 68.00 | . |
| | | | | 60 – 70 | 14.00 | 1 | . | 14.00 | . |
| | | | | Total | 41.00 | 2 | 38.184 | 41.00 | 1458.000 |
| | | Total | Hindu | < 20 | 14.00 | 1 | . | 14.00 | . |
| | | | | 20 – 30 | 13.00 | 1 | . | 13.00 | . |
| | | | | 30 – 40 | 29.80 | 5 | 22.421 | 25.00 | 502.700 |
| | | | | 40 - 50 | | 2 | .707 | 13.50 | .500 |
| | | | | 50 – 60 | 46.25 | 4 | 20.320 | 53.50 | 412.917 |
| | | | | 60 – 70 | 32.00 | 3 | 17.521 | 33.00 | 307.000 |
| | | | | > 70 | 36.00 | 1 | . | 36.00 | . |
| | | | | Total | 30.59 | 17 | 19.449 | 25.00 | 378.257 |
| | | | Muslim | 30 – 40 | 68.00 | 1 | . | 68.00 | . |
| | | | | > 70 | 68.00 | 1 | . | 68.00 | . |
| | | | | Total | 68.00 | 2 | .000 | 68.00 | .000 |
| | | | Jain | 40 – 50 | 68.00 | 1 | . | 68.00 | . |
| | | | | Total | 68.00 | 1 | . | 68.00 | . |
| | | | Total | < 20 | 14.00 | 1 | . | 14.00 | . |
| | | | | 20 – 30 | 13.00 | 1 | . | 13.00 | . |
| | | | | 30 – 40 | 36.17 | 6 | 25.404 | 28.50 | 645.367 |
| | | | | 40 – 50 | 31.67 | 3 | 31.470 | 14.00 | 990.333 |
| | | | | 50 – 60 | 46.25 | 4 | 20.320 | 53.50 | 412.917 |
| | | | | 60 – 70 | 32.00 | 3 | 17.521 | 33.00 | 307.000 |
| | | | | > 70 | 52.00 | 2 | 22.627 | 52.00 | 512.000 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | **Total** | **36.20** | **20** | **22.503** | **32.50** | **506.379** |
| | **Total** | **Unmarried** | **Hindu** | **< 20** | **24.50** | **36** | **18.613** | **18.50** | **346.429** |
| | | | | **20 – 30** | **31.91** | **11** | **25.422** | **15.00** | **646.291** |
| | | | | **30 – 40** | **34.50** | **2** | **27.577** | **34.50** | **760.500** |
| | | | | **40 – 50** | **37.83** | **6** | **17.175** | **36.00** | **294.967** |
| | | | | **50 – 60** | **20.50** | **2** | **10.607** | **20.50** | **112.500** |
| | | | | **60 – 70** | **63.50** | **2** | **13.435** | **63.50** | **180.500** |
| | | | | **Total** | **28.76** | **59** | **20.757** | **22.00** | **430.839** |
| | | | **Muslim** | **< 20** | **32.33** | **3** | **16.073** | **39.00** | **258.333** |
| | | | | **20 – 30** | **20.00** | **1** | **.** | **20.00** | **.** |
| | | | | **Total** | **29.25** | **4** | **14.500** | **29.50** | **210.250** |
| | | | **Total** | **< 20** | **25.10** | **39** | **18.362** | **20.00** | **337.147** |
| | | | | **20 – 30** | **30.92** | **12** | **24.482** | **17.50** | **599.356** |
| | | | | **30 – 40** | **34.50** | **2** | **27.577** | **34.50** | **760.500** |
| | | | | **40 – 50** | **37.83** | **6** | **17.175** | **36.00** | **294.967** |
| | | | | **50 – 60** | **20.50** | **2** | **10.607** | **20.50** | **112.500** |
| | | | | **60 – 70** | **63.50** | **2** | **13.435** | **63.50** | **180.500** |
| | | | | **Total** | **28.79** | **63** | **20.328** | **22.00** | **413.231** |
| | | **Married** | **Hindu** | **20 – 30** | **32.26** | **38** | **23.103** | **24.00** | **533.767** |
| | | | | **30 – 40** | **29.48** | **137** | **19.704** | **20.00** | **388.266** |
| | | | | **40 – 50** | **58.33** | **216** | **410.723** | **23.00** | **168693.405** |
| | | | | **50 – 60** | **31.26** | **227** | **18.653** | **26.00** | **347.952** |
| | | | | **60 – 70** | **35.61** | **127** | **17.772** | **36.00** | **315.860** |
| | | | | **> 70** | **39.06** | **54** | **18.651** | **37.50** | **347.865** |
| | | | | **Total** | **39.54** | **799** | **214.126** | **26.00** | **45849.908** |
| | | | **Muslim** | **20 – 30** | **38.83** | **6** | **24.734** | **44.50** | **611.767** |
| | | | | **30 – 40** | **35.67** | **9** | **24.784** | **23.00** | **614.250** |
| | | | | **40 – 50** | **29.70** | **23** | **19.450** | **23.00** | **378.312** |
| | | | | **50 – 60** | **25.33** | **12** | **19.910** | **18.50** | **396.424** |
| | | | | **60 – 70** | **44.00** | **7** | **24.180** | **48.00** | **584.667** |
| | | | | **> 70** | **36.50** | **2** | **44.548** | **36.50** | **1984.500** |
| | | | | **Total** | **32.58** | **59** | **22.064** | **23.00** | **486.800** |
| | | | **Sikh** | **30 – 40** | **65.00** | **1** | **.** | **65.00** | **.** |
| | | | | **Total** | **65.00** | **1** | **.** | **65.00** | **.** |
| | | | **Christian** | **40 – 50** | **48.00** | **1** | **.** | **48.00** | **.** |
| | | | | **60 – 70** | **17.00** | **1** | **.** | **17.00** | **.** |
| | | | | **Total** | **32.50** | **2** | **21.920** | **32.50** | **480.500** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | 20 – 30 | 33.16 | 44 | 23.144 | 26.00 | 535.625 |
| | | | | 30 – 40 | 30.10 | 147 | 20.148 | 22.00 | 405.942 |
| | | | | 40 – 50 | 55.55 | 240 | 389.692 | 23.00 | 151859.872 |
| | | | | 50 – 60 | 30.96 | 239 | 18.719 | 26.00 | 350.410 |
| | | | | 60 – 70 | 35.90 | 135 | 18.148 | 36.00 | 329.356 |
| | | | | > 70 | 38.96 | 56 | 19.275 | 37.50 | 371.526 |
| | | | | Total | 39.07 | 861 | 206.354 | 26.00 | 42581.818 |
| | | Widowed | Hindu | 30 – 40 | 24.75 | 4 | 5.252 | 27.00 | 27.583 |
| | | | | 40 – 50 | 32.93 | 14 | 20.749 | 25.50 | 430.533 |
| | | | | 50 – 60 | 29.62 | 21 | 20.468 | 17.00 | 418.948 |
| | | | | 60 – 70 | 30.30 | 20 | 18.333 | 24.00 | 336.116 |
| | | | | > 70 | 36.64 | 14 | 22.211 | 36.00 | 493.324 |
| | | | | Total | 31.52 | 73 | 19.558 | 23.00 | 382.531 |
| | | | Muslim | 30 – 40 | 51.00 | 1 | . | 51.00 | . |
| | | | | 40 – 50 | 27.00 | 1 | . | 27.00 | . |
| | | | | 60 – 70 | 52.00 | 2 | 28.284 | 52.00 | 800.000 |
| | | | | > 70 | 49.00 | 2 | 15.556 | 49.00 | 242.000 |
| | | | | Total | 46.67 | 6 | 17.409 | 44.50 | 303.067 |
| | | | Jain | 40 – 50 | 68.00 | 1 | . | 68.00 | . |
| | | | | Total | 68.00 | 1 | . | 68.00 | . |
| | | | Total | 30 – 40 | 30.00 | 5 | 12.590 | 28.00 | 158.500 |
| | | | | 40 – 50 | 34.75 | 16 | 21.306 | 27.50 | 453.933 |
| | | | | 50 – 60 | 29.62 | 21 | 20.468 | 17.00 | 418.948 |
| | | | | 60 – 70 | 32.27 | 22 | 19.570 | 28.50 | 382.970 |
| | | | | > 70 | 38.19 | 16 | 21.482 | 37.00 | 461.496 |
| | | | | Total | 33.11 | 80 | 19.988 | 25.50 | 399.519 |
| | | Divorced | Hindu | 20 – 30 | 47.50 | 2 | 36.062 | 47.50 | 1300.500 |
| | | | | 30 – 40 | 28.50 | 2 | 21.920 | 28.50 | 480.500 |
| | | | | 40 – 50 | 29.00 | 1 | . | 29.00 | . |
| | | | | Total | 36.20 | 5 | 23.488 | 29.00 | 551.700 |
| | | | Total | 20 – 30 | 47.50 | 2 | 36.062 | 47.50 | 1300.500 |
| | | | | 30 – 40 | 28.50 | 2 | 21.920 | 28.50 | 480.500 |
| | | | | 40 – 50 | 29.00 | 1 | . | 29.00 | . |
| | | | | Total | 36.20 | 5 | 23.488 | 29.00 | 551.700 |
| | | Total | Hindu | < 20 | 24.50 | 36 | 18.613 | 18.50 | 346.429 |
| | | | | 20 – 30 | 32.78 | 51 | 23.649 | 22.00 | 559.293 |
| | | | | 30 – 40 | 29.41 | 145 | 19.413 | 22.00 | 376.868 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | **40 – 50** | **56.19** | **237** | **392.123** | **23.00** | **153760.519** |
| | | | | **50 – 60** | **31.03** | **250** | **18.736** | **26.00** | **351.019** |
| | | | | **60 – 70** | **35.27** | **149** | **18.096** | **35.00** | **327.481** |
| | | | | **> 70** | **38.56** | **68** | **19.284** | **36.50** | **371.862** |
| | | | | **Total** | **38.22** | **936** | **197.992** | **26.00** | **39200.991** |
| | | | **Muslim** | **< 20** | **32.33** | **3** | **16.073** | **39.00** | **258.333** |
| | | | | **20 – 30** | **36.14** | **7** | **23.674** | **37.00** | **560.476** |
| | | | | **30 – 40** | **37.20** | **10** | **23.864** | **35.00** | **569.511** |
| | | | | **40 – 50** | **29.58** | **24** | **19.031** | **23.00** | **362.167** |
| | | | | **50 – 60** | **25.33** | **12** | **19.910** | **18.50** | **396.424** |
| | | | | **60 – 70** | **45.78** | **9** | **23.472** | **48.00** | **550.944** |
| | | | | **> 70** | **42.75** | **4** | **28.182** | **49.00** | **794.250** |
| | | | | **Total** | **33.61** | **69** | **21.537** | **27.00** | **463.859** |
| | | | **Jain** | **40 – 50** | **68.00** | **1** | **.** | **68.00** | **.** |
| | | | | **Total** | **68.00** | **1** | **.** | **68.00** | **.** |
| | | | **Sikh** | **30 – 40** | **65.00** | **1** | **.** | **65.00** | **.** |
| | | | | **Total** | **65.00** | **1** | **.** | **65.00** | **.** |
| | | | **Christian** | **40 – 50** | **48.00** | **1** | **.** | **48.00** | **.** |
| | | | | **60 – 70** | **17.00** | **1** | **.** | **17.00** | **.** |
| | | | | **Total** | **32.50** | **2** | **21.920** | **32.50** | **480.500** |
| | | | **Total** | **< 20** | **25.10** | **39** | **18.362** | **20.00** | **337.147** |
| | | | | **20 – 30** | **33.19** | **58** | **23.470** | **22.00** | **550.823** |
| | | | | **30 – 40** | **30.13** | **156** | **19.868** | **22.00** | **394.750** |
| | | | | **40 – 50** | **53.78** | **263** | **372.281** | **23.00** | **138593.419** |
| | | | | **50 – 60** | **30.77** | **262** | **18.789** | **26.00** | **353.012** |
| | | | | **60 – 70** | **35.75** | **159** | **18.515** | **36.00** | **342.822** |
| | | | | **> 70** | **38.79** | **72** | **19.632** | **37.50** | **385.407** |
| | | | | **Total** | **37.95** | **1009** | **190.780** | **26.00** | **36396.835** |

| One-Sample Statistics | | | | |
|---|---|---|---|---|
| | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | 1009 | 37.95 | 190.780 | 6.006 |

| One-Sample Test | | | | | | |
|---|---|---|---|---|---|---|
| | Test Value = 0 | | | | | |
| | t | df | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference | |
| | | | | | Lower | Upper |
| DIESEAS | 6.318 | 1008 | .000 | 37.95 | 26.16 | 49.73 |

# T-Test Table 8

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | GENDER | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Male | 603 | 44.79 | 246.133 | 10.023 |
| | Female | 406 | 27.77 | 19.091 | .947 |

**HYPOTHESIS Ho**: There is no significance difference between male and female as far as occurrence of cailsenoma/diseas is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 1.127 | .289 | 1.390 | 1007 | .165 | 17.02 | 12.242 | -7.002 | 41.044 |
| | Equal variances not assumed | | | 1.691 | 612.734 | .091 | 17.02 | 10.068 | -2.751 | 36.793 |

**CONCLUSION:** Here tcal= 1.390 & ttab = 1.96 at 5% level of **significa**nce d.f. = 1007 tcal < ttab accept the hypo Ho. Here we conclude that there is no significance difference between male and female as far as occurrence of cailsenoma/ disease is concerned.

# T-Test Table 9

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | MAR_STAT | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Unmarried | 63 | 28.79 | 20.328 | 2.561 |
| | Married | 861 | 39.07 | 206.354 | 7.033 |

**HYPOTHESIS Ho**: There is no significance difference between unmarried and married persons as far as occurrence of cailsenoma/disease are concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .101 | .750 | -.395 | 922 | .693 | -10.28 | 26.020 | -61.347 | 40.785 |
| | Equal variances not assumed | | | -1.374 | 886.861 | .170 | -10.28 | 7.484 | -24.970 | 4.408 |

**CONCLUSION**: Here tcal=-.395 ttab= 1.96 at 5% level of significance and d.f. = 922 tcal < ttab accept the hypo. Here we conclude that there is no significance difference between unmarried and married persons as far as occurrence of cailsenoma/disease are occurred.

## T-Test Table 10

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | MAR_STAT | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Unmarried | 63 | 28.79 | 20.328 | 2.561 |
| | Widowed | 80 | 33.11 | 19.988 | 2.235 |

**HYPOTHESIS Ho:** There is no significance difference between unmarried and widowed persons as far as occurrence of cailsenoma/disease are concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .040 | .842 | -1.273 | 141 | .205 | -4.32 | 3.392 | -11.025 | 2.387 |
| | Equal variances not assumed | | | -1.271 | 132.205 | .206 | -4.32 | 3.399 | -11.042 | 2.405 |

**CONCLUSION:** Here tcal=1.273 & ttab= 1.96 at 5% level of significance and d.f. = 141 tcal < ttab accept the hypo. Here we conclude that there is no significance difference between unmarried and widowed persons as far as occurrence of cailsenoma/disease are occurred.

# T-Test Table 11

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | MAR_STAT | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Unmarried | 63 | 28.79 | 20.328 | 2.561 |
| | Divorced | 5 | 36.20 | 23.488 | 10.504 |
| | | | | | |

**HYPOTHESIS Ho:** There is no significance difference between unmarried and divorced persons as far as occurrence of cailsenoma/disease are concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .022 | .883 | -.776 | 66 | .440 | -7.41 | 9.540 | -26.454 | 11.641 |
| | Equal variances not assumed | | | -.685 | 4.489 | .527 | -7.41 | 10.812 | -36.179 | 21.367 |

**CONCLUSION:** Here tcal=-.776 ttab= 1.96 at 5% level of significance and d.f. = 66 tcal < ttab accept the hypo. Here we conclude that there is no significance difference between unmarried and divorced persons as far as occurrence of cailsenoma/disease are occurred.

# T-Test Table 12

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | MAR_STAT | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Married | 861 | 39.07 | 206.354 | 7.033 |
| | Widowed | 80 | 33.11 | 19.988 | 2.235 |

**HYPOTHESIS Ho:** There is no significance difference between married and widowed persons as far as occurrence of cailsenoma/disease are concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .118 | .731 | .258 | 939 | .796 | 5.96 | 23.092 | -39.356 | 51.280 |
| | Equal variances not assumed | | | .808 | 938.300 | .419 | 5.96 | 7.379 | -8.519 | 20.443 |

**CONCLUSION:** Here tcal = .258 ttab = 1.96 at 5% level of significance and d.f. = 939 tcal < ttab accept the hypo. And we conclude that there is no significance difference between married and widowed persons as far as occurrence of cailsenoma/disease are occurred.

# T-Test Table 13

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | MAR_STAT | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Married | 861 | 39.07 | 206.354 | 7.033 |
| | Divorced | 5 | 36.20 | 23.488 | 10.504 |

**HYPOTHESIS Ho:** There is no significance difference between married and divorced persons as far as occurrence of cailsenoma/disease are concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .007 | .935 | .031 | 864 | .975 | 2.87 | 92.340 | -178.363 | 184.111 |
| | Equal variances not assumed | | | .227 | 8.381 | .826 | 2.87 | 12.641 | -26.047 | 31.795 |

**CONCLUSION:** Here tcal = .031& ttab = 1.96 at 5% level of significance and d.f. = 864.tcal < ttab accept the hypo. And we conclude that there is no significance difference between married and divoced persons as far as occurrence of cailsenoma/disease are occurred.

# T-Test Table 14

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | MAR_STAT | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Widowed | 80 | 33.11 | 19.988 | 2.235 |
| | Divorced | 5 | 36.20 | 23.488 | 10.504 |

**HYPOTHESIS Ho:** There is no significance difference between widowed and divorced persons as far as occurrence of cailsenoma/disease are concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .008 | .928 | -.332 | 83 | .741 | -3.09 | 9.298 | -21.581 | 15.406 |
| | Equal variances not assumed | | | -.287 | 4.370 | .787 | -3.09 | 10.739 | -31.935 | 25.760 |

**CONCLUSION:** Here tcal = -.332 & ttab = 1.96 at 5% level of significance and d.f. = 83. tcal < ttab accept the hypo. And we conclude that there is no significance difference between widowed and divoced persons as far as occurrence of cailsenoma/disease are concered.

# T-Test Table 15

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | LANG | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Gujarati | 822 | 39.10 | 211.167 | 7.365 |
| | Hindi | 167 | 32.47 | 19.403 | 1.501 |

**HYPOTHESIS Ho:** There is no significance difference between persons having different mother tongue (Gujarati & Hindi) as far as occurrence of cailsenoma/disease are concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .305 | .581 | .405 | 987 | .686 | 6.63 | 16.361 | -25.480 | 38.733 |
| | Equal variances not assumed | | | .882 | 883.113 | .378 | 6.63 | 7.517 | -8.126 | 21.380 |

**CONCLUSION:** Here tcal= .405 & ttab = 1.96 at 5% level of significance and d.f. = 987 tcal < ttab accept the hypo. And we conclude that there is no significance difference between persons having different mother tongue (Gujarati&Hindi) as far as occurrence of cailsenoma/disease are concerned.

# T-Test Table 16

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | LANG | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Gujarati | 822 | 39.10 | 211.167 | 7.365 |
| | Other | 20 | 36.20 | 22.503 | 5.032 |

**HYPOTHESIS Ho:** There is no significance difference between persons having different mother tongue (Gujarati&Other) as far as occurrence of cailsenoma/disease are concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .017 | .898 | .061 | 840 | .951 | 2.90 | 47.252 | -89.846 | 95.646 |
| | Equal variances not assumed | | | .325 | 169.620 | .746 | 2.90 | 8.920 | -14.709 | 20.508 |

**CONCLUSION:** Here tcal= .061& ttab = 1.96 at 5% level of significance and d.f. = 840. tcal < ttab accept the hypo. Here we conclude that there is no significance difference between persons having different mother tongue (Gujarati&Other) as far as occurrence of cailsenoma/disease are concerned.

# T-Test Table 17

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | LANG | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Hindi | 167 | 32.47 | 19.403 | 1.501 |
| | Other | 20 | 36.20 | 22.503 | 5.032 |

**HYPOTHESIS Ho:** There is no significance difference between persons having different mother tongue (Hindi&Other) as far as occurrence of cailsenoma/disease are concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 1.718 | .192 | -.798 | 185 | .426 | -3.73 | 4.672 | -12.944 | 5.490 |
| | Equal variances not assumed | | | -.710 | 22.514 | .485 | -3.73 | 5.251 | -14.603 | 7.149 |

**CONCLUSION:** Here tcal= -.798 & ttab = 1.96 at 5% level of significance and d.f. = 185. tcal < ttab accept the hypo. And we conclude that there is no significance difference between persons having different mother tongue (Hindi&Other) as far as occurrence of cailsenoma/disease are concerned.

# T-Test Table 18

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | **RELIGION** | **N** | **Mean** | **Std. Deviation** | **Std. Error Mean** |
| **DIESEAS** | **Hindu** | **936** | **38.22** | **197.992** | **6.472** |
| | **Muslim** | **69** | **33.61** | **21.537** | **2.593** |

**HYPOTHESIS Ho:** There is no significance difference between the religions (Hindu&Muslim) of a person as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **Levene's Test for Equality of Variances** | | **t-test for Equality of Means** | | | | | | |
| | | **F** | **Sig.** | **t** | **df** | **Sig. (2-tailed)** | **Mean Difference** | **Std. Error Difference** | **95% Confidence Interval of the Difference** | |
| | | | | | | | | | **Lower** | **Upper** |
| **DIESEAS** | **Equal variances assumed** | **.054** | **.816** | **.193** | **1003** | **.847** | **4.61** | **23.857** | **-42.208** | **51.422** |
| | **Equal variances not assumed** | | | **.661** | **929.839** | **.509** | **4.61** | **6.972** | **-9.075** | **18.289** |

**CONCLUSION:** Here tcal = .193 &ttab = 1.96 at 5% level of significance and d.f. = 1003 tcal< ttab Accept the hypo H0. And we conclude that there is no significance difference between the religions (Hindu&Muslim) of persons as far as occurrence of cailsenoma/disease is concerned.

# T-Test table 19

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Hindu | 936 | 38.22 | 197.992 | 6.472 |
| | Jain | 1 | 68.00 | . | . |

**HYPOTHESIS Ho:** There is no significance difference between the religions (Hindu&Jain) of a person as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | . | . | -.150 | 935 | .881 | -29.78 | 198.098 | -418.553 | 358.984 |
| | Equal variances not assumed | | | . | . | . | -29.78 | . | . | . |

**CONCLUSION:** Here tcal = .150 & ttab = 1.96 at 5% level of significance and d.f. = 935. tcal < ttab accept the hypo H0. And we conclude that there is no significance difference between the religions (Hindu&Jain) of persons as far as occurrence of cailsenoma/disease is concerned.

# T-Test Table 20

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | **RELIGION** | **N** | **Mean** | **Std. Deviation** | **Std. Error Mean** |
| **DIESEAS** | **Hindu** | **936** | **38.22** | **197.992** | **6.472** |
| | **Sikh** | **1** | **65.00** | **.** | **.** |

**HYPOTHESIS Ho:** There is no significance difference between the religions (Hindu & Sikh) of a person as far as occurrence of cailsenoma/disease is concerned.

**Independent Samples Test**

| | | **Levene's Test for Equality of Variances** | | **t-test for Equality of Means** | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **F** | **Sig.** | **t** | **df** | **Sig. (2-tailed)** | **Mean Difference** | **Std. Error Difference** | **95% Confidence Interval of the Difference** | |
| | | | | | | | | | **Lower** | **Upper** |
| **DIESEAS** | **Equal variances assumed** | **.** | **.** | **-.135** | **935** | **.892** | **-26.78** | **198.098** | **-415.553** | **361.984** |
| | **Equal variances not assumed** | | | **.** | **.** | **.** | **-26.78** | **.** | **.** | **.** |

**CONCLUSION:** Here tcal = .135 & ttab = 1.96 at 5% level of significance and d.f. = 935. tcal < ttab accept the hypo Ho. And we conclude that there is no significance difference between the religions (Hindu&Sikh) of persons as far as occurrence of cailsenoma/disease is concerned.

# T-test Table 21

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Hindu | 936 | 38.22 | 197.992 | 6.472 |
| | Christian | 2 | 32.50 | 21.920 | 15.500 |

**HYPOTHESIS Ho:** There is no significance difference between the religions (Hindu & Christian) of a person as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .004 | .949 | .041 | 936 | .967 | 5.72 | 140.077 | -269.186 | 280.618 |
| | Equal variances not assumed | | | .340 | 1.379 | .778 | 5.72 | 16.797 | -108.749 | 120.181 |

**CONCLUSION:** Here tcal = .041 & ttab = 1.96 at 5% level of significance and d.f. = 936. tcal < ttab accept the hypo Ho. And we conclude that there is no significance difference between the religions (Hindu&Christian) of persons as far as occurrence of cailsenoma/disease is concerned.

# T-Test Table 22

**Group Statistics**

| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| DIESEAS | Muslim | 69 | 33.61 | 21.537 | 2.593 |
| | Jain | 1 | 68.00 | . | . |

**HYPOTHESIS Ho:** There is no significance difference between the religions (Muslim & Jain) of persons as far as occurrence of cailsenoma/disease is concerned.

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | . | . | -1.585 | 68 | .118 | -34.39 | 21.693 | -77.679 | 8.896 |
| | Equal variances not assumed | | | . | . | . | -34.39 | . | . | . |

**CONCLUSION:** Here tcal = -1.585 & ttab = 1.96 at 5% level of significance and d.f. = 68. tcal < ttab accept the hypo H0. And we conclude that there is no significance difference between the religions (Muslim&Jain) of persons as far as occurrence of cailsenoma/disease is concerned.

# T-Test Table 23

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Muslim | 69 | 33.61 | 21.537 | 2.593 |
| | Sikh | 1 | 65.00 | . | . |

**HYPOTHESIS Ho:** There is no significance difference between the religions (Muslim&Sikh) of a person as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | . | . | -1.447 | 68 | .152 | -31.39 | 21.693 | -74.679 | 11.896 |
| | Equal variances not assumed | | | . | . | . | -31.39 | . | . | . |

**CONCLUSION:** Here tcal = -1.447 & ttab = 1.96 at 5% level of significance and d.f. = 68 tcal < ttab accept the hypo Ho. Here we conclude that there is no significance difference between the religions (Muslim&Sikh) of persons as far as occurrence of cailsenoma/disease is concerned.

# T-Test Table 24

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Muslim | 69 | 33.61 | 21.537 | 2.593 |
| | Christian | 2 | 32.50 | 21.920 | 15.500 |

**HYPOTHESIS Ho:** There is no significance difference between the religions (Muslim&Christian) of persons as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .238 | .627 | .072 | 69 | .943 | 1.11 | 15.452 | -29.718 | 31.935 |
| | Equal variances not assumed | | | .071 | 1.057 | .955 | 1.11 | 15.715 | -174.939 | 177.157 |

**CONCLUSION:** Here Tcal = .072 ttab = 1.96 at 5% level of significance and d.f. = 69 tcal < ttab accept the hypo Ho. And we conclude that there is no significance difference between the religions (Muslim&Christian) of persons as far as occurrence of cailsenoma/disease is concerned.

# T-Test Table 25

**Group Statistics**

| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| DIESEAS | Jain | 1 | 68.00 | . | . |
| | Christian | 2 | 32.50 | 21.920 | 15.500 |
| | | | | | |

**HYPOTHESIS Ho:** There is no significance difference between the religions (Jain&Christian) of a person as far as occurrence of cailsenoma/disease is concerned.

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | . | . | 1.322 | 1 | .412 | 35.50 | 26.847 | -305.621 | 376.621 |
| | Equal variances not assumed | | | . | . | . | 35.50 | . | . | . |

**CONCLUSION:** Here tcal = 1.322 & ttab = 12.71 at 5% level of significance and d.f. =1 69 tcal > ttab Reject the hypo Ho. And we conclude that there is significance difference between the religions (Jain&Christian) of persons as far as occurrence of cailsenoma/disease is concerned.

# T-Test Table 26

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Sikh | 1 | 65.00 | . | . |
| | Christian | 2 | 32.50 | 21.920 | 15.500 |
| | | | | | |

**HYPOTHESIS Ho:** There is no significance difference between the religions (Sikh&Christian) of a person as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | . | . | 1.211 | 1 | .440 | 32.50 | 26.847 | -308.621 | 373.621 |
| | Equal variances not assumed | | | . | . | . | 32.50 | . | . | . |

**CONCLUSION:** Here tcal=1.211 ttab= 12.71 5% level of significance and d.f. = 1 tcal > ttab Reject the hypo H0. And we conclude that there is significance difference between the religions (Sikh&Christian) of persons as far as occurrence of cailsenoma/disease is concerned.

# T-Test Table 27

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | < 20 | 39 | 25.10 | 18.362 | 2.940 |
| | 20 - 30 | 58 | 33.19 | 23.470 | 3.082 |

**HYPOTHESIS Ho:** There is no significance difference between age group below 20 and 20-30 of a person as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 7.990 | .006 | -1.810 | 95 | .073 | -8.09 | 4.467 | -16.956 | .781 |
| | Equal variances not assumed | | | -1.899 | 92.738 | .061 | -8.09 | 4.259 | -16.546 | .371 |

**CONCLUSION:** Here tcal = -1.810 and ttab = 1.96 at 5% level of signification and d.f. = 95 tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 20 and 20-30 of a person as far as occurrence of cailsenoma/disease is concered.

# T-Test Table 28

.

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | < 20 | 39 | 25.10 | 18.362 | 2.940 |
| | 30 - 40 | 156 | 30.13 | 19.868 | 1.591 |

**HYPOTHESIS Ho:** There is no significance difference between age group below 20 and 30-40 of persons as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 1.413 | .236 | -1.435 | 193 | .153 | -5.03 | 3.506 | -11.946 | 1.882 |
| | Equal variances not assumed | | | -1.505 | 62.196 | .137 | -5.03 | 3.343 | -11.714 | 1.650 |

**CONCULISION:** Here Tcal = -1.435 and Ttab = 1.96 at 5% level of signification and D.F. = 193 Tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 20 and 30-40 of a person as far as occurrence of cailsenoma/disease is conceder.

# T-Test Table 29

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | < 20 | 39 | 25.10 | 18.362 | 2.940 |
| | 40 - 50 | 263 | 53.78 | 372.281 | 22.956 |

**HYPOTHESIS Ho**: There is no significance difference between age group below 20 and 40-50 of a person as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .339 | .561 | -.480 | 300 | .631 | -28.67 | 59.708 | -146.172 | 88.826 |
| | Equal variances not assumed | | | -1.239 | 270.165 | .216 | -28.67 | 23.143 | -74.237 | 16.891 |

**CONCLUSION:** Here tcal = -.480 and ttab = 1.96 at 5% level of significance and D.F. = 300 tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 20 and 40-50 of a person as far as occurrence of cailsenoma/disease is conceder.

# T-Test Table 30

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | < 20 | 39 | 25.10 | 18.362 | 2.940 |
| | 50 - 60 | 262 | 30.77 | 18.789 | 1.161 |

**HYPOTHESIS Ho:** There is no significance difference between age group below 20 and 50-60 of a person as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .212 | .645 | -1.763 | 299 | .079 | -5.67 | 3.216 | -11.996 | .659 |
| | Equal variances not assumed | | | -1.793 | 50.590 | .079 | -5.67 | 3.161 | -12.016 | .679 |

**CONCLUSION:** Here tcal = -1.763 and ttab = 1.96 at 5% level of significance and d.f. = 2990 tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 20 and 50-60 of a person as far as occurrence of cailsenoma/disease is conceder.

# T-Test Table 31

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | < 20 | 39 | 25.10 | 18.362 | 2.940 |
| | 60 - 70 | 159 | 35.75 | 18.515 | 1.468 |

**HYPOTHESIS Ho**: There is no significance difference between age group below 20 and 60-70 of a person as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .046 | .831 | -3.223 | 196 | .001 | -10.65 | 3.303 | -17.160 | -4.131 |
| | Equal variances not assumed | | | -3.239 | 58.445 | .002 | -10.65 | 3.286 | -17.223 | -4.068 |

**CONCLUSION:** Here tcal = -3.223 and ttab = 1.96 at 5% level of significance and d.f. = 196 tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 20 and 60-70 of a person as far as occurrence of cailsenoma/disease is conceder.

# T-Test Table 32

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | < 20 | 39 | 25.10 | 18.362 | 2.940 |
| | > 70 | 72 | 38.79 | 19.632 | 2.314 |

**HYPOTHESIS Ho:** There is no significance difference between age group below 20 and above 70 of a person as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .439 | .509 | -3.586 | 109 | .001 | -13.69 | 3.817 | -21.254 | -6.124 |
| | Equal variances not assumed | | | -3.659 | 82.665 | .000 | -13.69 | 3.741 | -21.131 | -6.247 |

**CONCLUSION:** Here tcal = -3.586and ttab = 1.96 at 5% level of significance and d.f. = 2990 tcal < ttab accept the hypo. And we conclude that there is n0 significance difference between age group below 20 and above 70 of a person as far as occurrence of cailsenoma/disease is conceder.

# T-Test Table 33

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | 20 - 30 | 58 | 33.19 | 23.470 | 3.082 |
| | 30 - 40 | 156 | 30.13 | 19.868 | 1.591 |

**HYPOTHESIS Ho:** There is no significance difference between age group below 20-30 and 30-40 of persons as far as occurrence of cilsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 6.256 | .013 | .951 | 212 | .343 | 3.06 | 3.214 | -3.280 | 9.390 |
| | Equal variances not assumed | | | .881 | 89.096 | .381 | 3.06 | 3.468 | -3.836 | 9.946 |

**CONCLUSION:** Here tcal = .951 & ttab = 1.96 at 5% level of significance and d.f. = 212. tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 20-30 and 30-40 of a person as far as occurrence of cailsenoma/disease is conceder.

# T-Test Table 34

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | 20 - 30 | 58 | 33.19 | 23.470 | 3.082 |
| | 40 - 50 | 263 | 53.78 | 372.281 | 22.956 |

**HYPOTHESIS Ho:** There is no significance difference between age group below 20-30 and 40-50 of a person as far as occurrence of cilsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .346 | .557 | -.420 | 319 | .674 | -20.59 | 48.964 | -116.919 | 75.747 |
| | Equal variances not assumed | | | -.889 | 271.124 | .375 | -20.59 | 23.162 | -66.186 | 25.014 |

**CONCLUSION:** Here Tcal =-.420and Ttab = 1.96 at 5% level of significance and d.f. =319. tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 20-30 and 40-50 of a person as far as occurrence of cailsenoma/disease is conceder.

# T-Test Table 35

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | 20 - 30 | 58 | 33.19 | 23.470 | 3.082 |
| | 50 - 60 | 262 | 30.77 | 18.789 | 1.161 |

**HYPOTHESIS Ho:** There is no significance difference between age group below 20-30 and 50-60 of a person as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 12.487 | .000 | .846 | 318 | .398 | 2.42 | 2.860 | -3.209 | 8.046 |
| | Equal variances not assumed | | | .734 | 73.996 | .465 | 2.42 | 3.293 | -4.143 | 8.980 |

**CONCLUSION:** Here tcal =.846 & Ttab = 1.96 at 5% level of significance and d.f. =318 tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 20-30 and 50-60 of a person as far as occurrence of cailsenoma/disease is conceder.

# T-Test Table 36

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | 20 - 30 | 58 | 33.19 | 23.470 | 3.082 |
| | 60 - 70 | 159 | 35.75 | 18.515 | 1.468 |

**HYPOTHESIS Ho:** There is no significance difference between age group below 20-30 and 60-70 of a person as far as occurrence of cilsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 12.805 | .000 | -.836 | 215 | .404 | -2.56 | 3.060 | -8.590 | 3.473 |
| | Equal variances not assumed | | | -.750 | 84.253 | .456 | -2.56 | 3.414 | -9.347 | 4.229 |

**CONCLUSION:** Here tcal =-.846 & ttab = 1.96 at 5% level of significance and d.f. =215. tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 20-30 and 50-60 of a person as far as occurrence of cailsenoma/disease is conceder.

# T-Test Table 37

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | 20 - 30 | 58 | 33.19 | 23.470 | 3.082 |
| | > 70 | 72 | 38.79 | 19.632 | 2.314 |

**HYPOTHESIS Ho**: There is no significance difference between age group below 20-30 and above 70 of a person as far as occurrence of cilsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 6.242 | .014 | -1.482 | 128 | .141 | -5.60 | 3.780 | -13.082 | 1.878 |
| | Equal variances not assumed | | | -1.454 | 111.042 | .149 | -5.60 | 3.854 | -13.238 | 2.034 |

**CONCLUSION:** Here tcal =-1.482 & ttab = 1.96 at 5% level of significance and d.f. =128. tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 20-30 and 50-60 of a person as far as occurrence of cailsenoma/disease is conceder.

# T-Test Table 38

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | 30 - 40 | 156 | 30.13 | 19.868 | 1.591 |
| | 40 - 50 | 263 | 53.78 | 372.281 | 22.956 |

**HYPOTHESIS Ho:** There is no significance difference between age group 30-40 and 40-50 of a person as far as occurrence of cilsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 1.198 | .274 | -.792 | 417 | .429 | -23.64 | 29.846 | -82.308 | 35.026 |
| | Equal variances not assumed | | | -1.027 | 264.512 | .305 | -23.64 | 23.011 | -68.949 | 21.667 |

**CONCLUSION:** Here tcal =-.792 & ttab = 1.96 at 5% level of significance and d.f. =417. tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 20-30 and 50-60 of a person as far as occurrence of cailsenoma/disease is conceder.

# T-Test Table 39

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | 30 - 40 | 156 | 30.13 | 19.868 | 1.591 |
| | 50 - 60 | 262 | 30.77 | 18.789 | 1.161 |

**HYPOTHESIS Ho:** There is no significance difference between age group 30-40 and 50-60 of a person as far as occurrence of cilsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 1.720 | .190 | -.328 | 416 | .743 | -.64 | 1.941 | -4.453 | 3.180 |
| | Equal variances not assumed | | | -.323 | 311.553 | .747 | -.64 | 1.969 | -4.511 | 3.238 |

**CONCLUSION:** Here tcal =-.328 & ttab = 1.96 at 5% level of significance and d.f. =416. tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 20-30 and 50-60 of a person as far as occurrence of cailsenoma/disease is conceder.

# T-Test Table 40

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | **AGE_GR** | **N** | **Mean** | **Std. Deviation** | **Std. Error Mean** |
| **DIESEAS** | **30 - 40** | **156** | **30.13** | **19.868** | **1.591** |
| | **60 - 70** | **159** | **35.75** | **18.515** | **1.468** |

**HYPOTHESIS Ho:** There is no significance difference between age group 30-40 and 60-70 of a person as far as occurrence of cilsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | **Levene's Test for Equality of Variances** | | **t-test for Equality of Means** | | | | | | |
| | | **F** | **Sig.** | **t** | **df** | **Sig. (2-tailed)** | **Mean Difference** | **Std. Error Difference** | **95% Confidence Interval of the Difference** | |
| | | | | | | | | | **Lower** | **Upper** |
| **DIESEAS** | **Equal variances assumed** | **2.355** | **.126** | **-2.595** | **313** | **.010** | **-5.61** | **2.163** | **-9.870** | **-1.357** |
| | **Equal variances not assumed** | | | **-2.593** | **310.515** | **.010** | **-5.61** | **2.165** | **-9.873** | **-1.354** |

**CONCULISION:** Here tcal =-2.595 & ttab = 1.96 at 5% level of significance and d.f. =313. tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 30-40 and 60-70 of a person as far as occurrence of cailsenoma/disease is conceder.

# T-Test Table 41

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | **AGE_GR** | **N** | **Mean** | **Std. Deviation** | **Std. Error Mean** |
| **DIESEAS** | **30 - 40** | 156 | 30.13 | 19.868 | 1.591 |
| | **> 70** | 72 | 38.79 | 19.632 | 2.314 |

**HYPOTHESIS Ho:** There is no significance difference between age group 30-40 and above70 of a person as far as occurrence of cilsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .266 | .606 | -3.070 | 226 | .002 | -8.66 | 2.820 | -14.214 | -3.100 |
| | Equal variances not assumed | | | -3.083 | 139.694 | .002 | -8.66 | 2.808 | -14.208 | -3.106 |

**CONCLUSION:** Here tcal =-3.070 & ttab = 1.96 at 5% level of significance and d.f. =226. tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 30-40 and above 70 of a person as far as occurrence of cailsenoma/disease is conceder.

## T-Test Table 42

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | 40 - 50 | 263 | 53.78 | 372.281 | 22.956 |
| | 50 - 60 | 262 | 30.77 | 18.789 | 1.161 |

**HYPOTHESIS Ho**: There is no significance difference between age group 40-50 and 50-60 of a person as far as occurrence of cilsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 2.181 | .140 | .999 | 523 | .318 | 23.00 | 23.029 | -22.236 | 68.245 |
| | Equal variances not assumed | | | 1.001 | 263.340 | .318 | 23.00 | 22.985 | -22.253 | 68.263 |

**CONCLUSION:** Here tcal =.999 & ttab = 1.96 at 5% level of significance and d.f. =523 tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 40-50 and 50-60 of a person as far as occurrence of cailsenoma/disease is conceder.

## T-Test Table 43

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | 40 - 50 | 263 | 53.78 | 372.281 | 22.956 |
| | 60 - 70 | 159 | 35.75 | 18.515 | 1.468 |

**HYPOTHESIS Ho:** There is no significance difference between age group 40-50 and 60-70 of a person as far as occurrence of cilsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 1.355 | .245 | .610 | 420 | .542 | 18.03 | 29.560 | -40.076 | 76.131 |
| | Equal variances not assumed | | | .784 | 264.141 | .434 | 18.03 | 23.003 | -27.265 | 63.319 |

**CONCLUSION:** Here tcal =.610 & ttab = 1.96 at 5% level of significance and D.F. =420 Tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 40-50 and 60-70 of a person as far as occurrence of cailsenoma/disease is conceder.

## T-Test Table 44

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | 40 - 50 | 263 | 53.78 | 372.281 | 22.956 |
| | > 70 | 72 | 38.79 | 19.632 | 2.314 |

**HYPOTHESIS Ho**: There is no significance difference between age group 40-50 and above 70 of persons as far as occurrence of cilsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .578 | .448 | .341 | 333 | .733 | 14.98 | 43.938 | -71.447 | 101.415 |
| | Equal variances not assumed | | | .649 | 267.248 | .517 | 14.98 | 23.072 | -30.442 | 60.410 |

**CONCLUSION:** Here tcal =.341and ttab = 1.96 at 5% level of significance and d.f. =333. tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 40-50 and 60-70 of a person as far as occurrence of cailsenoma/disease is conceder.

## T-Test Table 45

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | 50 - 60 | 262 | 30.77 | 18.789 | 1.161 |
| | 60 - 70 | 159 | 35.75 | 18.515 | 1.468 |

**HYPOTHESIS Ho:** There is no significance difference between age group 50-60 and 60-70 of a person as far as occurrence of cilsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .162 | .687 | -2.650 | 419 | .008 | -4.98 | 1.878 | -8.670 | -1.285 |
| | Equal variances not assumed | | | -2.659 | 337.408 | .008 | -4.98 | 1.872 | -8.659 | -1.296 |

**CONCLUSION:** Here tcal =-2.650 & Ttab = 1.96 at 5% level of significance and d.f. = 419. tcal < ttab accept the hypo. Here we conclude that there is no significance difference between age group below 50-60 and 60-70 of a person as far as occurrence of cailsenoma/disease is conceder.

## T-Test Table 46

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | 50 - 60 | 262 | 30.77 | 18.789 | 1.161 |
| | > 70 | 72 | 38.79 | 19.632 | 2.314 |

**HYPOTHESIS Ho:** There is no significance difference between age group 50-60 and above70 of a person as far as occurrence of cilsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .185 | .668 | -3.177 | 332 | .002 | -8.02 | 2.524 | -12.987 | -3.055 |
| | Equal variances not assumed | | | -3.099 | 109.357 | .002 | -8.02 | 2.588 | -13.151 | -2.891 |

**CONCLUSION:** Here tcal = -3.177and ttab = 1.96 at 5% level of significance and d.f. =332 tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 50-60 and above 70 of a person as far as occurrence of cailsenoma/disease is conceder.

## T-Test Table 47

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | 60 - 70 | 159 | 35.75 | 18.515 | 1.468 |
| | > 70 | 72 | 38.79 | 19.632 | 2.314 |

**HYPOTHESIS Ho:** There is no significance difference between age group 60-70 and above70 of a person as far as occurrence of cilsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .459 | .499 | -1.135 | 229 | .257 | -3.04 | 2.680 | -8.324 | 2.238 |
| | Equal variances not assumed | | | -1.111 | 130.222 | .269 | -3.04 | 2.740 | -8.464 | 2.378 |

**CONCLUSION:** Here tcal =-1.135and ttab = 1.96 at 5% level of significance and d.f. =229 tcal < ttab accept the hypo. And we conclude that there is no significance difference between age group below 60-70 and above70 of a person as far as occurrence of cailsenoma/disease is conceder.

## General Conclusion: For T Test:

(1) Here we conculed that they have the same chances of occurance of cailsenoma/diseases whether persons are male or female.

(2) Here we conculed that they have the same chances of occurance of calisenoma/diseases whether persons are different martial-status like unmarried, married, widowed, divoced.

(3) Here we conculed that they have the same chances of occurance of calisenoma/diseases whether persons have any age groups like below 20, 20-30, 30-40, 40-50, 50-60, and above 70.

(4) Here we conculed that this is the life style of the persons of two religious are different. Generally, Hindu or Jain is purely vageterion. Where as other community like Christian, Muslim, and Sikh are non-vegerterion. So they have the different chances of occurance of cailsenoma/diseases.

# Table 48

## Univariate Analysis of Variance

| Between-Subjects Factors | | | |
|---|---|---|---|
| | | Value Label | N |
| YEAR | 2000 | | 127 |
| | 2002 | | 130 |
| | 2003 | | 127 |
| | 2004 | | 226 |
| | 2005 | | 308 |
| | 2006 | | 91 |
| GENDER | 1 | Male | 603 |
| | 2 | Female | 406 |
| MAR_STAT | 1 | Unmarried | 63 |
| | 2 | Married | 861 |
| | 3 | Widowed | 80 |
| | 4 | Divorced | 5 |
| LANG | 1 | Gujarati | 822 |
| | 2 | Hindi | 167 |
| | 3 | Other | 20 |
| RELIGION | 1 | Hindu | 936 |
| | 2 | Muslim | 69 |
| | 3 | Jain | 1 |
| | 4 | Sikh | 1 |
| | 5 | Christian | 2 |
| AGE_GR | 1 | < 20 | 39 |
| | 2 | 20 - 30 | 58 |
| | 3 | 30 - 40 | 156 |
| | 4 | 40 - 50 | 263 |
| | 5 | 50 - 60 | 262 |
| | 6 | 60 - 70 | 159 |
| | | > 70 | 72 |

| Tests of Between-Subjects Effects<br>Dependent Variable: DIESEAS | | | | | |
|---|---|---|---|---|---|
| Source | Type III Sum of Squares | df | Mean Square | F | Sig. |
| Corrected Model | 972214.110(a) | 200 | 4861.071 | .110 | 1.000 |
| Intercept | 76176.219 | 1 | 76176.219 | 1.723 | .190 |
| YEAR | 3165.271 | 5 | 633.054 | .014 | 1.000 |
| GENDER | 2201.838 | 1 | 2201.838 | .050 | .823 |
| MAR_STAT | 3273.175 | 3 | 1091.058 | .025 | .995 |
| LANG | 750.560 | 2 | 375.280 | .008 | .992 |
| RELIGION | 2605.786 | 3 | 868.595 | .020 | .996 |
| AGE_GR | 4595.260 | 6 | 765.877 | .017 | 1.000 |
| YEAR * GENDER | 3014.560 | 5 | 602.912 | .014 | 1.000 |
| YEAR * MAR_STAT | 3996.425 | 7 | 570.918 | .013 | 1.000 |
| GENDER * MAR_STAT | 3240.210 | 2 | 1620.105 | .037 | .964 |
| YEAR * GENDER * MAR_STAT | 116.057 | 1 | 116.057 | .003 | .959 |
| YEAR * LANG | 667.307 | 1 | 667.307 | .015 | .902 |
| GENDER * LANG | 514.661 | 2 | 257.330 | .006 | .994 |
| YEAR * GENDER * LANG | .000 | 0 | . | . | . |
| MAR_STAT * LANG | 72.917 | 1 | 72.917 | .002 | .968 |
| YEAR * MAR_STAT * LANG | .000 | 0 | . | . | . |
| GENDER * MAR_STAT * LANG | .000 | 0 | . | . | . |
| YEAR * GENDER * MAR_STAT * LANG | .000 | 0 | . | . | . |
| YEAR * RELIGION | 1149.052 | 4 | 287.263 | .006 | 1.000 |
| GENDER * RELIGION | 1245.522 | 1 | 1245.522 | .028 | .867 |
| YEAR * GENDER * RELIGION | 25227.282 | 3 | 8409.094 | .190 | .903 |
| MAR_STAT * RELIGION | 534.628 | 2 | 267.314 | .006 | .994 |
| YEAR * MAR_STAT * RELIGION | .000 | 0 | . | . | . |

| | | | | | |
|---|---|---|---|---|---|
| **GENDER * MAR_STAT * RELIGION** | **.000** | **0** | **.** | **.** | **.** |
| **YEAR * GENDER * MAR_STAT * RELIGION** | **.000** | **0** | **.** | **.** | **.** |
| **LANG * RELIGION** | **.000** | **0** | **.** | **.** | **.** |
| **YEAR * LANG * RELIGION** | **.000** | **0** | **.** | **.** | **.** |
| **GENDER * LANG * RELIGION** | **.000** | **0** | **.** | **.** | **.** |
| **YEAR * GENDER * LANG * RELIGION** | **.000** | **0** | **.** | **.** | **.** |
| **MAR_STAT * LANG * RELIGION** | **.000** | **0** | **.** | **.** | **.** |
| **YEAR * MAR_STAT * LANG * RELIGION** | **.000** | **0** | **.** | **.** | **.** |
| **GENDER * MAR_STAT * LANG * RELIGION** | **.000** | **0** | **.** | **.** | **.** |
| **YEAR * GENDER * MAR_STAT * LANG * RELIGION** | **.000** | **0** | **.** | **.** | **.** |
| **YEAR * AGE_GR** | **17559.167** | **29** | **605.489** | **.014** | **1.000** |
| **GENDER * AGE_GR** | **4285.162** | **6** | **714.194** | **.016** | **1.000** |
| **YEAR * GENDER * AGE_GR** | **158623.663** | **18** | **8812.426** | **.199** | **1.000** |
| **MAR_STAT * AGE_GR** | **1650.263** | **7** | **235.752** | **.005** | **1.000** |
| **YEAR * MAR_STAT * AGE_GR** | **2352.269** | **8** | **294.034** | **.007** | **1.000** |
| **GENDER * MAR_STAT * AGE_GR** | **1202.972** | **3** | **400.991** | **.009** | **.999** |
| **YEAR * GENDER * MAR_STAT * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **LANG * AGE_GR** | **3444.767** | **10** | **344.477** | **.008** | **1.000** |
| **YEAR * LANG * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **GENDER * LANG * AGE_GR** | **1810.619** | **5** | **362.124** | **.008** | **1.000** |
| **YEAR * GENDER * LANG * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **MAR_STAT * LANG *** | **.000** | **0** | **.** | **.** | **.** |

| | | | | | |
|---|---|---|---|---|---|
| **AGE_GR** | | | | | |
| **YEAR * MAR_STAT * LANG * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **GENDER * MAR_STAT * LANG * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **YEAR * GENDER * MAR_STAT * LANG * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **RELIGION * AGE_GR** | **7706.940** | **4** | **1926.735** | **.044** | **.996** |
| **YEAR * RELIGION * AGE_GR** | **30783.129** | **9** | **3420.348** | **.077** | **1.000** |
| **GENDER * RELIGION * AGE_GR** | **18794.940** | **3** | **6264.980** | **.142** | **.935** |
| **YEAR * GENDER * RELIGION * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **MAR_STAT * RELIGION * AGE_GR** | **801.607** | **1** | **801.607** | **.018** | **.893** |
| **YEAR * MAR_STAT * RELIGION * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **GENDER * MAR_STAT * RELIGION * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **YEAR * GENDER * MAR_STAT * RELIGION * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **LANG * RELIGION * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **YEAR * LANG * RELIGION * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **GENDER * LANG * RELIGION * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **YEAR * GENDER * LANG * RELIGION * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **MAR_STAT * LANG * RELIGION * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **YEAR * MAR_STAT * LANG** | **.000** | **0** | **.** | **.** | **.** |

| | | | | | |
|---|---|---|---|---|---|
| *** RELIGION * AGE_GR** | | | | | |
| **GENDER * MAR_STAT * LANG * RELIGION * AGE_GR** | **.000** | **0** | **.** | **.** | **.** |
| **Error** | **35715795.892** | **808** | **44202.718** | | |
| **Total** | **38140829.000** | **1009** | | | |
| **Corrected Total** | **36688010.002** | **1008** | | | |
| **a R Squared = .026 (Adjusted R Squared = -.214)** | | | | | |

# CONCLUSION:

**(1) Here Fcal= .020 & Ftab (3,808) at 5% level of significance= 8.53 Fcal < Ftab We accept the hypo.Not significant. i.e. Experimental error is significant. There is no signific**ance Difference between Religions of a person as far as occurance of Calsenoma/disease is concered.

(2) Here Fcal= .017 & Ftab (6,808) at 5% level of significance= 3.67 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between Age group of a person as far as occurance of calsenoma/disease is concered.

(3) Here Fcal= .014 & Ftab (5,808) at 5% level of significance= 5.63 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between intra groups (Year & Sex) of a person as far as occurance of calsenoma/disease is concered.

(4) Here Fcal= .013 & Ftab (7,808) at 5% level of significance= 3.23 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between intragroup (Year & Marital Status) of a person as far as occurance of calsenoma/disease is concered.

(5) Here Fcal= .037 & Ftab (2,808) at 5% level of significance= 19.50 Fcal < Ftab We accept the hypo.Not significant. I.e. experimental error is significant. There is no significance difference between intragroup (Sex & Marital Status) of a person as far as occurance of calsenoma/disease is concered.

(6) Here Fcal= .003 & Ftab (1,808) at 5% level of significance= 254.32 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance

difference between intragroup (Year & Sex & Marital status) of a persons as far as occurance of calsenoma/disease is concered.

(7) Here Fcal= .015 & Ftab (1,808) at 5% level of significance= 254.32 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between intragroup (Year & Mother tongue (langue)) of a persons as far as occurance of calsenoma/disease is concered.

(8) Here Fcal= .006 & Ftab (2,808) at 5% level of significance= 19.50 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between intragroup (Sex & Mother tongue (langue)) of a persons as far as occurance of calsenoma/disease is concered.

(9) Here Fcal= .002 & Ftab (1,808) at 5% level of significance= 254.32 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between intragroup (Marital status & Mother tongue (langue)) of a persons as far as occurance of calsenoma/disease is concered.

(10) Here Fcal= .006 & Ftab (4,808) at 5% level of significance= 5.63 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between intragroup (Year & Religion) of a person as far as occurance of calsenoma/disease is concered.

(11) Here Fcal= .190 & Ftab (1,808) at 5% level of significance=254.32 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between three intragroup (Year &Sex & Religion) of a persons as far as occurance of calsenoma/disease is concered. Here Fcal= .006 & Ftab (2,808) at 5% level of significance= 19.50 Fcal < Ftab We accept the hypo.Not significant.

(12) Experimental error is significant. There is no significance difference between two intragroup (Marital Status & Religion) of a person as far as occurance of calsenoma/disease is concered.

(13) Here Fcal= .014 & Ftab (29,808) at 5% level of significance= 1.64 Fcal < Ftab We accept the hypo.Not significant. i.e.

experimental error is significant. There is no significance difference between two intragroup (Year &Age Group) of a person as far as occurance of calsenoma/disease is concered.

(14) Here Fcal= .016 & Ftab (6,808) at 5% level of significance= 3.67 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between two intragroup (Sex &Age Group) of a person as far as occurance of calsenoma/disease is concered.

(15) Here Fcal= .199 & Ftab (18,808) at 5% level of significance= 1.92 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between three intragroup (Year &Sex &Age Group) of a person as far as occurance of calsenoma/disease is concered.

(16) Here Fcal= .005 & Ftab (7,808) at 5% level of significance= 3.23 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between two intragroup (Marital Status &Age Group) of a person as far as occurance of calsenoma/disease is concered.

(17) Here Fcal= .007 & Ftab (8,808) at 5% level of significance= 2.93 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between three intragroup (Year &Marital Status &Age Group) of a person as far as occurance of calsenoma/disease is concered.

(18) Here Fcal= .009 & Ftab (3,808) at 5% level of significance= 8.53 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between three intragroup (Sex &Marital Status &Age Group) of a person as far as occurance of calsenoma/disease is concered.

(19) Here Fcal= .008 & Ftab (10,808) at 5% level of significance= 2.54 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between two intragroup (Mother Tongue (Language) &Age Group) of a persons as far as occurance of calsenoma/disease is concered.

(20) Here Fcal= .008 & Ftab (5,808) at 5% level of significance= 4.36 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between three intragroup (Sex & Mother Tongue, (Language) &Age Group) of a persons as far as occurance of calsenoma/disease is concered.

(21) Here Fcal= .044 & Ftab (4,808) at 5% level of significance= 5.63 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between two intragroup (Religion &Age Group) of a person as far as occurance of calsenoma/disease is concered.

(22) Here Fcal= .077 & Ftab (9,808) at 5% level of significance= 2.71 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between three intragroup (Year & Religion &Age Group) of a person as far as occurance of calsenoma/disease is concered.

(23) Here Fcal= .142 & Ftab (3,808) at 5% level of significance= 8.53 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between three intragroup (Sex & Religion &Age Group) of a person as far as occurance of calsenoma/disease is concered.

(24) Here Fcal= .018 & Ftab (1,808) at 5% level of significance= .018 Fcal < Ftab We accept the hypo.Not significant. i.e. experimental error is significant. There is no significance difference between three intragroup (Marital Status & Religion &Age Group) of a person as far as occurance of calsenoma/disease is concered.

**General Conclusion: For F test:**

These factors are not important as far as occurance of calisenoma/diseases is concered.

# Table-49

## DIESEAS * YEAR

| Crosstab Count | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | YEAR | | | | | | Total |
| | | 2000 | 2002 | 2003 | 2004 | 2005 | 2006 | |
| DIESEAS | 1 | 1 | 1 | 2 | 1 | 2 | 1 | 8 |
| | 2 | 2 | | 2 | | | 1 | 5 |
| | 3 | | | | | 1 | | 1 |
| | 4 | | 1 | 1 | 1 | 1 | 1 | 5 |
| | 5 | | | 1 | | 1 | | 2 |
| | 6 | | | | | 1 | | 1 |
| | 7 | | | | | 2 | | 2 |
| | 8 | | | | 1 | 2 | 2 | 5 |
| | 9 | | | | | 1 | | 1 |
| | 10 | | | | | 2 | | 2 |
| | 11 | 7 | 9 | 5 | 14 | 16 | 3 | 54 |
| | 12 | 3 | 2 | 2 | 2 | 8 | 1 | 18 |
| | 13 | 15 | 14 | 13 | 20 | 24 | 11 | 97 |
| | 14 | 6 | | 5 | 7 | 9 | 3 | 30 |
| | 15 | 6 | 6 | 7 | 14 | 15 | 10 | 58 |
| | 16 | 1 | | 2 | | 3 | | 6 |
| | 17 | 10 | 11 | 9 | 26 | 30 | 9 | 95 |
| | 18 | 1 | 1 | 2 | | | | 4 |
| | 19 | 1 | 2 | | 1 | 3 | 2 | 9 |
| | 20 | | 1 | 2 | 1 | 3 | | 7 |
| | 21 | 1 | 1 | 1 | 1 | 3 | | 7 |
| | 22 | 1 | 4 | 5 | 1 | 2 | | 13 |
| | 23 | 7 | 6 | 7 | 14 | 12 | 4 | 50 |
| | 24 | | | 2 | | | | 2 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **25** | **1** | **1** | **1** | | | **1** | **4** |
| | **26** | | **2** | **2** | **8** | **8** | **5** | **25** |
| | **27** | **1** | | **1** | **3** | | **1** | **6** |
| | **28** | | **2** | **2** | **2** | **14** | **1** | **21** |
| | **29** | | | **1** | **3** | | | **4** |
| | **30** | | | | | **1** | | **1** |
| | | | | | | | | |
| | **31** | | **1** | | **1** | | | **2** |
| | **32** | **1** | | **2** | **1** | **1** | **2** | **7** |
| | **33** | **3** | **3** | **3** | **9** | **13** | **1** | **32** |
| | **34** | | **2** | **2** | **5** | **2** | **1** | **12** |
| | **35** | | **3** | | **2** | **4** | | **9** |
| | **36** | **12** | **6** | **10** | **8** | **12** | **3** | **51** |
| | **37** | | **2** | **1** | **5** | **5** | | **13** |
| | **38** | | **1** | **4** | **2** | | | **7** |
| | **39** | | **1** | **1** | **1** | | | **3** |
| | **40** | **2** | **2** | | | **1** | | **5** |
| | **41** | **2** | **5** | **2** | **8** | **9** | | **26** |
| | **42** | | | | **1** | | | **1** |
| | **43** | | **1** | | | **2** | | **3** |
| | **44** | **1** | **2** | **2** | **3** | **5** | | **13** |
| | **45** | **1** | **1** | | **1** | **2** | **1** | **6** |
| | **46** | **2** | | **1** | **3** | | | **6** |
| | **47** | **2** | **1** | **2** | **3** | **6** | **1** | **15** |
| | **48** | **9** | **4** | **1** | **12** | **15** | **1** | **42** |
| | **49** | **3** | **4** | | **1** | | **1** | **9** |
| | **50** | **1** | | | | | | **1** |
| | **51** | **1** | | **1** | **2** | **7** | **1** | **12** |
| | **52** | | | **1** | | | **1** | **2** |
| | **53** | | | **1** | | **2** | **2** | **5** |
| | **54** | **3** | **4** | **1** | **4** | **3** | **2** | **17** |
| | **55** | **1** | | **1** | **3** | **1** | | **6** |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **56** | | | **1** | **2** | | | **3** |
| | **57** | **1** | **2** | **1** | **3** | **1** | **2** | **10** |
| | **58** | **1** | | | | | | **1** |
| | **59** | **1** | **2** | **1** | **1** | **4** | **3** | **12** |
| | **60** | **1** | **1** | **1** | **3** | **3** | **1** | **10** |
| | **61** | **1** | | | | **2** | | **3** |
| | **62** | **1** | **1** | | **2** | **1** | | **5** |
| | **63** | | **1** | | | | | **1** |
| | **64** | | **1** | | | **1** | | **2** |
| | **65** | | | | **1** | | | **1** |
| | **66** | | | | | **1** | **1** | **2** |
| | **67** | **3** | **4** | | | **4** | | **11** |
| | **68** | **3** | **7** | **3** | **8** | **16** | **5** | **42** |
| | **69** | **5** | | **3** | **7** | **8** | **3** | **26** |
| | **70** | **1** | **2** | **2** | **2** | **4** | | **11** |
| | **71** | | | **1** | | | | **1** |
| | **72** | **1** | **2** | **1** | **1** | **5** | **2** | **12** |
| | **73** | | | **1** | | **2** | **1** | **4** |
| | **74** | | | | **1** | | | **1** |
| | **75** | | | | | **1** | | **1** |
| | **76** | | | **1** | | | | **1** |
| **Total** | | **127** | **130** | **127** | **226** | **308** | **91** | **1009** |

# Table-50

## DIESEAS * GENDER

| Crosstab<br>Count | | | | |
|---|---|---|---|---|
| | | GENDER | | Total |
| | | Male | Female | |
| DIESEAS | 1 | 4 | 4 | 8 |
| | 2 | 5 | | 5 |
| | 3 | 1 | | 1 |
| | 4 | 2 | 3 | 5 |
| | 5 | 1 | 1 | 2 |
| | 6 | | 1 | 1 |
| | 7 | 2 | | 2 |
| | 8 | 3 | 2 | 5 |
| | 9 | | 1 | 1 |
| | 10 | | 2 | 2 |
| | 11 | 51 | 3 | 54 |
| | 12 | 16 | 2 | 18 |
| | 13 | 2 | 95 | 97 |
| | 14 | 20 | 10 | 30 |
| | 15 | 50 | 8 | 58 |
| | 16 | 6 | | 6 |
| | 17 | 3 | 92 | 95 |
| | 18 | 2 | 2 | 4 |
| | 19 | 9 | | 9 |
| | 20 | 5 | 2 | 7 |
| | 21 | | 7 | 7 |
| | 22 | 9 | 4 | 13 |
| | 23 | 35 | 15 | 50 |
| | 24 | 2 | | 2 |
| | 25 | 4 | | 4 |

| | | | | |
|---|---|---|---|---|
| | **26** | **18** | **7** | **25** |
| | **27** | **2** | **4** | **6** |
| | **28** | **13** | **8** | **21** |
| | **29** | **3** | **1** | **4** |
| | **30** | **1** | | **1** |
| | **31** | **2** | | **2** |
| | **32** | **3** | **4** | **7** |
| | **33** | **30** | **2** | **32** |
| | **34** | **8** | **4** | **12** |
| | **35** | **7** | **2** | **9** |
| | **36** | **41** | **10** | **51** |
| | **37** | **8** | **5** | **13** |
| | **38** | **2** | **5** | **7** |
| | **39** | **2** | **1** | **3** |
| | **40** | **2** | **3** | **5** |
| | **41** | **19** | **7** | **26** |
| | **42** | **1** | | **1** |
| | **43** | **3** | | **3** |
| | **44** | | **13** | **13** |
| | **45** | **6** | | **6** |
| | **46** | **6** | | **6** |
| | **47** | **13** | **2** | **15** |
| | **48** | **38** | **4** | **42** |
| | **49** | **9** | | **9** |
| | **50** | | **1** | **1** |
| | **51** | **10** | **2** | **12** |
| | **52** | **2** | | **2** |
| | **53** | **3** | **2** | **5** |
| | **54** | **8** | **9** | **17** |
| | **55** | **3** | **3** | **6** |
| | **56** | **2** | **1** | **3** |
| | **57** | **5** | **5** | **10** |

| | | | | |
|---|---|---|---|---|
| | **58** | | **1** | **1** |
| | **59** | **10** | **2** | **12** |
| | **60** | **7** | **3** | **10** |
| | **61** | **2** | **1** | **3** |
| | **62** | **3** | **2** | **5** |
| | **63** | **1** | | **1** |
| | **64** | **2** | | **2** |
| | **65** | | **1** | **1** |
| | **66** | **2** | | **2** |
| | **67** | **10** | **1** | **11** |
| | **68** | **29** | **13** | **42** |
| | **69** | **25** | **1** | **26** |
| | **70** | **4** | **7** | **11** |
| | **71** | **1** | | **1** |
| | **72** | **1** | **11** | **12** |
| | **73** | | **4** | **4** |
| | **74** | **1** | | **1** |
| | **75** | **1** | | **1** |
| | **76** | **1** | | **1** |
| **Total** | | **603** | **406** | **1009** |

# Table-51

## DIESEAS * MAR_STAT

| Crosstab Count | | | | | | |
|---|---|---|---|---|---|---|
| | | MAR_STAT | | | | Total |
| | | Unmarried | Married | Widowed | Divorced | |
| DIESEAS | 1 | | 7 | 1 | | 8 |
| | 2 | 2 | 3 | | | 5 |
| | 3 | 1 | | | | 1 |
| | 4 | 2 | 3 | | | 5 |
| | 5 | | 2 | | | 2 |
| | 6 | 1 | | | | 1 |
| | 7 | | 2 | | | 2 |
| | 8 | | 5 | | | 5 |
| | 9 | | 1 | | | 1 |
| | 10 | | 2 | | | 2 |
| | 11 | | 53 | 1 | | 54 |
| | 12 | 6 | 12 | | | 18 |
| | 13 | 3 | 83 | 10 | 1 | 97 |
| | 14 | 10 | 19 | 1 | | 30 |
| | 15 | 2 | 54 | 2 | | 58 |
| | 16 | | 6 | | | 6 |
| | 17 | 1 | 77 | 17 | | 95 |
| | 18 | | 4 | | | 4 |
| | 19 | | 9 | | | 9 |
| | 20 | 3 | 4 | | | 7 |
| | 21 | | 5 | 2 | | 7 |
| | 22 | 2 | 10 | | 1 | 13 |
| | 23 | | 45 | 5 | | 50 |
| | 24 | 2 | | | | 2 |
| | 25 | | 3 | 1 | | 4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **26** | | **24** | **1** | | **25** |
| | **27** | | **5** | **1** | | **6** |
| | **28** | **2** | **16** | **3** | | **21** |
| | **29** | | **3** | | **1** | **4** |
| | **30** | | **1** | | | **1** |
| | **31** | **1** | **1** | | | **2** |
| | **32** | **1** | **5** | **1** | | **7** |
| | **33** | | **31** | **1** | | **32** |
| | **34** | **2** | **10** | | | **12** |
| | **35** | **2** | **7** | | | **9** |
| | **36** | | **47** | **4** | | **51** |
| | **37** | **1** | **12** | | | **13** |
| | **38** | | **6** | **1** | | **7** |
| | **39** | **3** | | | | **3** |
| | **40** | | **3** | **2** | | **5** |
| | **41** | **1** | **25** | | | **26** |
| | **42** | | **1** | | | **1** |
| | **43** | **1** | **2** | | | **3** |
| | **44** | **2** | **9** | **1** | **1** | **13** |
| | **45** | | **6** | | | **6** |
| | **46** | | **6** | | | **6** |
| | **47** | | **12** | **3** | | **15** |
| | **48** | | **40** | **2** | | **42** |
| | **49** | | **9** | | | **9** |
| | **50** | | | **1** | | **1** |
| | **51** | | **10** | **2** | | **12** |
| | **52** | | **2** | | | **2** |
| | **53** | | **5** | | | **5** |
| | **54** | **3** | **14** | | | **17** |
| | **55** | **1** | **5** | | | **6** |
| | **56** | | **3** | | | **3** |
| | **57** | | **5** | **5** | | **10** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **58** | | **1** | | | **1** |
| | **59** | | **12** | | | **12** |
| | **60** | **1** | **6** | **3** | | **10** |
| | **61** | | **3** | | | **3** |
| | **62** | | **5** | | | **5** |
| | **63** | | **1** | | | **1** |
| | **64** | | **2** | | | **2** |
| | **65** | | **1** | | | **1** |
| | **66** | | **2** | | | **2** |
| | **67** | **2** | **9** | | | **11** |
| | **68** | **2** | **36** | **4** | | **42** |
| | **69** | | **25** | **1** | | **26** |
| | **70** | **2** | **9** | | | **11** |
| | **71** | | **1** | | | **1** |
| | **72** | | **9** | **3** | | **12** |
| | **73** | **1** | **1** | **1** | **1** | **4** |
| | **74** | | **1** | | | **1** |
| | **75** | | **1** | | | **1** |
| | **76** | | **1** | | | **1** |
| **Total** | | **63** | **861** | **80** | **5** | **1009** |

# Table-52

## DIESEAS * LANG

| Crosstab Count | | | | | |
|---|---|---|---|---|---|
| | | LANG | | | Total |
| | | Gujarati | Hindi | Other | |
| DIESEAS | 1 | 7 | 1 | | 8 |
| | 2 | 3 | 2 | | 5 |
| | 3 | 1 | | | 1 |
| | 4 | 4 | 1 | | 5 |
| | 5 | 2 | | | 2 |
| | 6 | 1 | | | 1 |
| | 7 | 2 | | | 2 |
| | 8 | 5 | | | 5 |
| | 9 | 1 | | | 1 |
| | 10 | 2 | | | 2 |
| | 11 | 41 | 13 | | 54 |
| | 12 | 14 | 3 | 1 | 18 |
| | 13 | 78 | 16 | 3 | 97 |
| | 14 | 23 | 4 | 3 | 30 |
| | 15 | 51 | 7 | | 58 |
| | 16 | 5 | 1 | | 6 |
| | 17 | 80 | 14 | 1 | 95 |
| | 18 | 2 | 2 | | 4 |
| | 19 | 8 | 1 | | 9 |
| | 20 | 6 | 1 | | 7 |
| | 21 | 6 | 1 | | 7 |
| | 22 | 10 | 3 | | 13 |
| | 23 | 40 | 10 | | 50 |
| | 24 | 2 | | | 2 |
| | 25 | 2 | 1 | 1 | 4 |

| | | | | | |
|---|---|---|---|---|---|
| | **26** | **25** | | | **25** |
| | **27** | **5** | **1** | | **6** |
| | **28** | **20** | **1** | | **21** |
| | **29** | **4** | | | **4** |
| | **30** | **1** | | | **1** |
| | **31** | **2** | | | **2** |
| | **32** | **6** | | **1** | **7** |
| | **33** | **29** | **2** | **1** | **32** |
| | **34** | **12** | | | **12** |
| | **35** | **6** | **3** | | **9** |
| | **36** | **34** | **16** | **1** | **51** |
| | **37** | **11** | **2** | | **13** |
| | **38** | **6** | **1** | | **7** |
| | **39** | **3** | | | **3** |
| | **40** | **3** | **2** | | **5** |
| | **41** | **22** | **4** | | **26** |
| | **42** | **1** | | | **1** |
| | **43** | **2** | **1** | | **3** |
| | **44** | **11** | **2** | | **13** |
| | **45** | **4** | **2** | | **6** |
| | **46** | **4** | **2** | | **6** |
| | **47** | **13** | **2** | | **15** |
| | **48** | **30** | **11** | **1** | **42** |
| | **49** | **5** | **3** | **1** | **9** |
| | **50** | | **1** | | **1** |
| | **51** | **11** | **1** | | **12** |
| | **52** | **2** | | | **2** |
| | **53** | **5** | | | **5** |
| | **54** | **13** | **4** | | **17** |
| | **55** | **5** | **1** | | **6** |
| | **56** | **3** | | | **3** |
| | **57** | **7** | **3** | | **10** |

| | | | | | |
|---|---|---|---|---|---|
| | **58** | | **1** | | **1** |
| | **59** | **10** | **1** | **1** | **12** |
| | **60** | **9** | **1** | | **10** |
| | **61** | **2** | | **1** | **3** |
| | **62** | **4** | **1** | | **5** |
| | **63** | **1** | | | **1** |
| | **64** | **2** | | | **2** |
| | **65** | **1** | | | **1** |
| | **66** | **2** | | | **2** |
| | **67** | **6** | **4** | **1** | **11** |
| | **68** | **36** | **3** | **3** | **42** |
| | **69** | **21** | **5** | | **26** |
| | **70** | **9** | **2** | | **11** |
| | **71** | **1** | | | **1** |
| | **72** | **9** | **3** | | **12** |
| | **73** | **4** | | | **4** |
| | **74** | **1** | | | **1** |
| | **75** | **1** | | | **1** |
| | **76** | **1** | | | **1** |
| **Total** | | **822** | **167** | **20** | **1009** |

# Table-53

## DIESEAS * RELIGION

| Crosstab Count | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | RELIGION | | | | | Total |
| | | Hindu | Muslim | Jain | Sikh | Christian | |
| DIESEAS | 1 | 8 | | | | | 8 |
| | 2 | 5 | | | | | 5 |
| | 3 | 1 | | | | | 1 |
| | 4 | 4 | 1 | | | | 5 |
| | 5 | | 2 | | | | 2 |
| | 6 | 1 | | | | | 1 |
| | 7 | 1 | 1 | | | | 2 |
| | 8 | 5 | | | | | 5 |
| | 9 | 1 | | | | | 1 |
| | 10 | 2 | | | | | 2 |
| | 11 | 52 | 2 | | | | 54 |
| | 12 | 18 | | | | | 18 |
| | 13 | 87 | 10 | | | | 97 |
| | 14 | 27 | 3 | | | | 30 |
| | 15 | 52 | 6 | | | | 58 |
| | 16 | 6 | | | | | 6 |
| | 17 | 93 | 1 | | | 1 | 95 |
| | 18 | 4 | | | | | 4 |
| | 19 | 8 | 1 | | | | 9 |
| | 20 | 6 | 1 | | | | 7 |
| | 21 | 7 | | | | | 7 |
| | 22 | 12 | 1 | | | | 13 |
| | 23 | 45 | 5 | | | | 50 |
| | 24 | 2 | | | | | 2 |
| | 25 | 4 | | | | | 4 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | **26** | **25** | | | | | **25** |
| | **27** | **5** | **1** | | | | **6** |
| | **28** | **21** | | | | | **21** |
| | **29** | **4** | | | | | **4** |
| | **30** | **1** | | | | | **1** |
| | **31** | **2** | | | | | **2** |
| | **32** | **6** | **1** | | | | **7** |
| | **33** | **30** | **2** | | | | **32** |
| | **34** | **12** | | | | | **12** |
| | **35** | **9** | | | | | **9** |
| | **36** | **48** | **3** | | | | **51** |
| | **37** | **12** | **1** | | | | **13** |
| | **38** | **6** | **1** | | | | **7** |
| | **39** | **2** | **1** | | | | **3** |
| | **40** | **5** | | | | | **5** |
| | **41** | **26** | | | | | **26** |
| | **42** | **1** | | | | | **1** |
| | **43** | **3** | | | | | **3** |
| | **44** | **12** | **1** | | | | **13** |
| | **45** | **6** | | | | | **6** |
| | **46** | **6** | | | | | **6** |
| | **47** | **13** | **2** | | | | **15** |
| | **48** | **38** | **3** | | | **1** | **42** |
| | **49** | **9** | | | | | **9** |
| | **50** | **1** | | | | | **1** |
| | **51** | **11** | **1** | | | | **12** |
| | **52** | **1** | **1** | | | | **2** |
| | **53** | **3** | **2** | | | | **5** |
| | **54** | **16** | **1** | | | | **17** |
| | **55** | **5** | **1** | | | | **6** |
| | **56** | **3** | | | | | **3** |
| | **57** | **10** | | | | | **10** |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **58** | **1** | | | | **1** |
| | **59** | **11** | **1** | | | **12** |
| | **60** | **8** | **2** | | | **10** |
| | **61** | **3** | | | | **3** |
| | **62** | **5** | | | | **5** |
| | **63** | **1** | | | | **1** |
| | **64** | **2** | | | | **2** |
| | **65** | | | **1** | | **1** |
| | **66** | **2** | | | | **2** |
| | **67** | **10** | **1** | | | **11** |
| | **68** | **38** | **3** | **1** | | **42** |
| | **69** | **23** | **3** | | | **26** |
| | **70** | **10** | **1** | | | **11** |
| | **71** | **1** | | | | **1** |
| | **72** | **11** | **1** | | | **12** |
| | **73** | **4** | | | | **4** |
| | **74** | **1** | | | | **1** |
| | **75** | | **1** | | | **1** |
| | **76** | **1** | | | | **1** |
| **Total** | | **936** | **69** | **1** | **1** | **2** | **1009** |

# Table-54

**DIESEAS * AGE_GR**

| Crosstab Count | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | AGE_GR | | | | | | | Total |
| | | < 20 | 20 - 30 | 30 - 40 | 40 - 50 | 50 - 60 | 60 - 70 | > 70 | |
| DIESEAS | 1 | | | 2 | 1 | 3 | 2 | | 8 |
| | 2 | 2 | 2 | | 1 | | | | 5 |
| | 3 | 1 | | | | | | | 1 |
| | 4 | 2 | | 1 | 2 | | | | 5 |
| | 5 | | | | | 1 | | 1 | 2 |
| | 6 | 1 | | | | | | | 1 |
| | 7 | | 1 | | | 1 | | | 2 |
| | 8 | | | | 3 | 2 | | | 5 |
| | 9 | | | | 1 | | | | 1 |
| | 10 | | 1 | 1 | | | | | 2 |
| | 11 | | 1 | 6 | 9 | 22 | 10 | 6 | 54 |
| | 12 | 4 | 4 | 2 | 2 | 3 | 2 | 1 | 18 |
| | 13 | | 4 | 22 | 33 | 24 | 10 | 4 | 97 |
| | 14 | 8 | 7 | 4 | 6 | 3 | 2 | | 30 |
| | 15 | | 3 | 15 | 20 | 16 | 4 | | 58 |
| | 16 | | | 1 | 2 | | 2 | 1 | 6 |
| | 17 | 1 | 2 | 21 | 32 | 26 | 11 | 2 | 95 |
| | 18 | | | | | 4 | | | 4 |
| | 19 | | 1 | | 3 | 2 | 2 | 1 | 9 |
| | 20 | 2 | 1 | 1 | 2 | | | 1 | 7 |
| | 21 | | | | 1 | 2 | 3 | 1 | 7 |
| | 22 | 1 | 3 | 5 | 2 | 2 | | | 13 |
| | 23 | | | 6 | 13 | 18 | 7 | 6 | 50 |
| | 24 | 2 | | | | | | | 2 |
| | 25 | | | 2 | 1 | | 1 | | 4 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **26** | | **3** | **3** | **8** | **11** | | | **25** |
| | **27** | | **1** | | **3** | **1** | **1** | | **6** |
| | **28** | | | **5** | **8** | **4** | **4** | | **21** |
| | **29** | | | **1** | **2** | | **1** | | **4** |
| | **30** | | | | | | | **1** | **1** |
| | **31** | **1** | | | **1** | | | | **2** |
| | **32** | **1** | | **1** | **2** | **1** | **2** | | **7** |
| | **33** | | | **1** | **7** | **12** | **11** | **1** | **32** |
| | **34** | **2** | **1** | **1** | **1** | **5** | **2** | | **12** |
| | **35** | **1** | | **1** | **3** | **1** | **2** | **1** | **9** |
| | **36** | | | **3** | **11** | **15** | **14** | **8** | **51** |
| | **37** | | **1** | **1** | **3** | **5** | **2** | **1** | **13** |
| | **38** | | | | **1** | **2** | **1** | **3** | **7** |
| | **39** | **3** | | | | | | | **3** |
| | **40** | | | **1** | **2** | | **1** | **1** | **5** |
| | **41** | | **3** | **6** | **7** | **6** | **3** | **1** | **26** |
| | **42** | | | | | **1** | | | **1** |
| | **43** | **1** | | **1** | | **1** | | | **3** |
| | **44** | **2** | | **4** | **4** | **2** | **1** | | **13** |
| | **45** | | | | | **4** | **1** | **1** | **6** |
| | **46** | | | **2** | **2** | | **2** | | **6** |
| | **47** | | **1** | **1** | **2** | **7** | **2** | **2** | **15** |
| | **48** | | **1** | **2** | **10** | **12** | **12** | **5** | **42** |
| | **49** | | | | | **1** | **4** | **4** | **9** |
| | **50** | | | | | | **1** | | **1** |
| | **51** | | | **3** | | **4** | **4** | **1** | **12** |
| | **52** | | **1** | | | **1** | | | **2** |
| | **53** | | | | **4** | **1** | | | **5** |
| | **54** | | **1** | **2** | **8** | | **4** | **2** | **17** |
| | **55** | **1** | | **2** | **2** | **1** | | | **6** |
| | **56** | | **1** | **2** | | | | | **3** |
| | **57** | | **1** | | | **2** | **4** | **3** | **10** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **58** | | | **1** | | | | | **1** |
| | **59** | | | **1** | **3** | **4** | **4** | | **12** |
| | **60** | | | **1** | **3** | **1** | **4** | **1** | **10** |
| | **61** | | | **2** | | **1** | | | **3** |
| | **62** | | | **1** | | **1** | **3** | | **5** |
| | **63** | | | | | **1** | | | **1** |
| | **64** | | | **1** | | | **1** | | **2** |
| | **65** | | | **1** | | | | | **1** |
| | **66** | | | | **1** | **1** | | | **2** |
| | **67** | **2** | **3** | **4** | **2** | | | | **11** |
| | **68** | **1** | **4** | **7** | **14** | **9** | **1** | **6** | **42** |
| | **69** | | | **1** | **7** | **8** | **6** | **4** | **26** |
| | **70** | | **4** | **1** | **2** | **2** | **1** | **1** | **11** |
| | **71** | | | **1** | | | | | **1** |
| | **72** | | **1** | **2** | **3** | **3** | **3** | | **12** |
| | **73** | | **1** | | **1** | | **1** | **1** | **4** |
| | **74** | | | | | **1** | | | **1** |
| | **75** | | | | | **1** | | | **1** |
| | **76** | | | | **1** | | | | **1** |
| **Total** | | **39** | **58** | **156** | **263** | **262** | **159** | **72** | **1009** |

# Table- 55 T-Test

**Frequency Table**

| AGE_GR | | | | | |
|---|---|---|---|---|---|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | < 20 | 39 | 3.9 | 3.9 | 3.9 |
| | 20 - 30 | 58 | 5.7 | 5.7 | 9.6 |
| | 30 - 40 | 156 | 15.5 | 15.5 | 25.1 |
| | 40 - 50 | 263 | 26.1 | 26.1 | 51.1 |
| | 50 - 60 | 262 | 26.0 | 26.0 | 77.1 |
| | 60 - 70 | 159 | 15.8 | 15.8 | 92.9 |
| | > 70 | 72 | 7.1 | 7.1 | 100.0 |
| | Total | 1009 | 100.0 | 100.0 | |

| AGE_GR2 | | | | | |
|---|---|---|---|---|---|
| | | Frequency | Percent | Valid Percent | Cumulative Percent |
| Valid | <= 40 | 253 | 25.1 | 25.1 | 25.1 |
| | > 40 | 756 | 74.9 | 74.9 | 100.0 |
| | Total | 1009 | 100.0 | 100.0 | |

**HYPOTHESIS Ho:** There is no significance difference between below and equal to 40 age group and above 40 age group of a person as far as occurance of disease/cilesenoma is concered.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 3.542 | .060 | -1.820 | 1007 | .069 | -2.59 | 1.423 | -5.381 | .203 |
| | Equal variances not assumed | | | -1.759 | 408.999 | .079 | -2.59 | 1.472 | -5.482 | .305 |

**CONCLUSION:** Here tcal=-1.820 & ttab=1.96 at 5% level of significance and d.f. =1007.tcal <ttab accept the hypothesis. And we conclude that there is no significance difference between below 40 age group and above 40 age group of a person as far as occurance of disease/cilesenoma is concered.

# Table-56

## Crosstabs

| DIESEAS * AGE_GR2 Crosstabulation Count | | | | |
|---|---|---|---|---|
| | | AGE_GR2 | | Total |
| | | <= 40 | > 40 | |
| DIESEAS | 1 | 2 | 6 | 8 |
| | 2 | 4 | 1 | 5 |
| | 3 | 1 | | 1 |
| | 4 | 3 | 2 | 5 |
| | 5 | | 2 | 2 |
| | 6 | 1 | | 1 |
| | 7 | 1 | 1 | 2 |
| | 8 | | 5 | 5 |
| | 9 | | 1 | 1 |
| | 10 | 2 | | 2 |
| | 11 | 7 | 47 | 54 |
| | 12 | 10 | 8 | 18 |
| | 13 | 26 | 71 | 97 |
| | 14 | 19 | 11 | 30 |
| | 15 | 18 | 40 | 58 |
| | 16 | 1 | 5 | 6 |
| | 17 | 24 | 71 | 95 |
| | 18 | | 4 | 4 |
| | 19 | 1 | 8 | 9 |
| | 20 | 4 | 3 | 7 |
| | 21 | | 7 | 7 |
| | 22 | 9 | 4 | 13 |
| | 23 | 6 | 44 | 50 |
| | 24 | 2 | | 2 |
| | 25 | 2 | 2 | 4 |

| | | | | |
|---|---|---|---|---|
| | 26 | 6 | 19 | 25 |
| | 27 | 1 | 5 | 6 |
| | 28 | 5 | 16 | 21 |
| | 29 | 1 | 3 | 4 |
| | 30 | | 1 | 1 |
| | 31 | 1 | 1 | 2 |
| | 32 | 2 | 5 | 7 |
| | 33 | 1 | 31 | 32 |
| | 34 | 4 | 8 | 12 |
| | 35 | 2 | 7 | 9 |
| | 36 | 3 | 48 | 51 |
| | 37 | 2 | 11 | 13 |
| | 38 | | 7 | 7 |
| | 39 | 3 | | 3 |
| | 40 | 1 | 4 | 5 |
| | 41 | 9 | 17 | 26 |
| | 42 | | 1 | 1 |
| | 43 | 2 | 1 | 3 |
| | 44 | 6 | 7 | 13 |
| | 45 | | 6 | 6 |
| | 46 | 2 | 4 | 6 |
| | 47 | 2 | 13 | 15 |
| | 48 | 3 | 39 | 42 |
| | 49 | | 9 | 9 |
| | 50 | | 1 | 1 |
| | 51 | 3 | 9 | 12 |
| | 52 | 1 | 1 | 2 |
| | 53 | | 5 | 5 |
| | 54 | 3 | 14 | 17 |
| | 55 | 3 | 3 | 6 |
| | 56 | 3 | | 3 |
| | 57 | 1 | 9 | 10 |

| | | | | |
|---|---|---|---|---|
| | 58 | 1 | | 1 |
| | 59 | 1 | 11 | 12 |
| | 60 | 1 | 10 | 11 |
| | 61 | 2 | 1 | 3 |
| | 62 | 1 | 4 | 5 |
| | 63 | | 1 | 1 |
| | 64 | 1 | 1 | 2 |
| | 65 | 1 | | 1 |
| | 66 | | 2 | 2 |
| | 67 | 9 | 2 | 11 |
| | 68 | 12 | 30 | 42 |
| | 69 | 1 | 25 | 26 |
| | 70 | 5 | 6 | 11 |
| | 71 | 1 | | 1 |
| | 72 | 3 | 9 | 12 |
| | 73 | 1 | 3 | 4 |
| | 74 | | 1 | 1 |
| | 75 | | 1 | 1 |
| | 76 | | 1 | 1 |
| Total | | 253 | 756 | 1009 |

**HYPOTHESIS Ho:** There is no significant difference between the Proportions of the diseases in two age groups.

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 212.160(a) | 75 | .000 |
| Likelihood Ratio | 220.452 | 75 | .000 |
| Linear-by-Linear Association | 3.303 | 1 | .069 |
| N of Valid Cases | 1009 | | |
| a 102 cells (67.1%) have expected count less than 5. The minimum expected count is .25. | | | |

**CONCLUSION:** Here We Conclude that Proportion of disease is less than 40 groups are smaller than above 40 groups.

## Table-57

### Crosstabs

**DIESEAS * GENDER**

| Crosstab Count | | | | |
|---|---|---|---|---|
| | | GENDER | | Total |
| | | Male | Female | |
| DIESEAS | 11 | 51 | 3 | 54 |
| | 13 | 2 | 95 | 97 |
| | 15 | 50 | 8 | 58 |
| | 17 | 3 | 92 | 95 |
| | 23 | 35 | 15 | 50 |
| | 33 | 30 | 2 | 32 |
| | 36 | 41 | 10 | 51 |
| | 48 | 38 | 4 | 42 |
| | 68 | 29 | 13 | 42 |
| Total | | 279 | 242 | 521 |

**HYPOTHESIS Ho:** There is no significant difference between propotion of the disease between male & female having disease numbers 11, 13,15,17,23,33,36,48 &68.

| Chi-Square Tests | | | |
|---|---|---|---|
| | Value | df | Asymp. Sig. (2-sided) |
| Pearson Chi-Square | 329.621(a) | 8 | .000 |
| Likelihood Ratio | 398.878 | 8 | .000 |
| Linear-by-Linear Association | 51.118 | 1 | .000 |
| N of Valid Cases | 521 | | |
| a 0 cells (.0%) have expected count less than 5. The minimum expected count is 14.86. | | | |

**CONCLUSION:**Here we conclude that their is significant difference between propotion of the disease between male & female having disease numbers11,13,15,17,23,33,36,48 &68.

## Table-58

**DIESEAS * MAR_STAT**

**Crosstab**
**Count**

| | | MAR_STAT | | | | Total |
|---|---|---|---|---|---|---|
| | | Unmarried | Married | Widowed | Divorced | |
| DIESEAS | 11 | | 53 | 1 | | 54 |
| | 13 | 3 | 83 | 10 | 1 | 97 |
| | 15 | 2 | 54 | 2 | | 58 |
| | 17 | 1 | 77 | 17 | | 95 |
| | 23 | | 45 | 5 | | 50 |
| | 33 | | 31 | 1 | | 32 |
| | 36 | | 47 | 4 | | 51 |
| | 48 | | 40 | 2 | | 42 |
| | 68 | 2 | 36 | 4 | | 42 |
| Total | | 8 | 466 | 46 | 1 | 521 |

**HYPOTHESIS Ho**: There is no significant effect between propotion of the diseases of the marital-status having disease no. 11, 13, 15, 17, 23, 33, 36, 48&68.

**Chi-Square Tests**

| | Value | df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 31.798(a) | 24 | .132 |
| Likelihood Ratio | 33.085 | 24 | .102 |
| Linear-by-Linear Association | .573 | 1 | .449 |
| N of Valid Cases | 521 | | |

a 24 cells (66.7%) have expected count less than 5. The minimum expected count is .06.

**CONCLUSION:** Here we conclude that there is no significant effect between propotion of the diseases of the marital-status having disease no. 11, 13, 15, 17, 23, 33, 36, 48 & 68.

## Table-59

**DIESEAS * LANG**

**Crosstab**
**Count**

| | | LANG | | | Total |
|---|---|---|---|---|---|
| | | Gujarati | Hindi | Other | |
| DIESEAS | 11 | 41 | 13 | | 54 |
| | 13 | 78 | 16 | 3 | 97 |
| | 15 | 51 | 7 | | 58 |
| | 17 | 80 | 14 | 1 | 95 |
| | 23 | 40 | 10 | | 50 |
| | 33 | 29 | 2 | 1 | 32 |
| | 36 | 34 | 16 | 1 | 51 |
| | 48 | 30 | 11 | 1 | 42 |
| | 68 | 36 | 3 | 3 | 42 |
| Total | | 419 | 92 | 10 | 521 |

**HYPOTHESIS Ho:** Here we conclude that there is no significant effect between propotions of the disease of a language having disease number 11, 13, 15, 23, 33, 36, 48 & 68.

**Chi-Square Tests**

| | Value | df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 28.458(a) | 16 | .028 |
| Likelihood Ratio | 29.404 | 16 | .021 |
| Linear-by-Linear Association | 1.370 | 1 | .242 |
| N of Valid Cases | 521 | | |

a 9 cells (33.3%) have expected count less than 5. The minimum expected count is .61.

**CONCLUSION:** There is significant effect between propotions of the disease of a language having disease number 11, 13, 15, 23, 33, 36, 48 & 68.

## Table-60

**DIESEAS * RELIGION**

**Crosstab**
**Count**

| | | RELIGION | | | | Total |
|---|---|---|---|---|---|---|
| | | Hindu | Muslim | Jain | Christian | |
| DIESEAS | 11 | 52 | 2 | | | 54 |
| | 13 | 87 | 10 | | | 97 |
| | 15 | 52 | 6 | | | 58 |
| | 17 | 93 | 1 | | 1 | 95 |
| | 23 | 45 | 5 | | | 50 |
| | 33 | 30 | 2 | | | 32 |
| | 36 | 48 | 3 | | | 51 |
| | 48 | 38 | 3 | | 1 | 42 |
| | 68 | 38 | 3 | 1 | | 42 |
| Total | | 483 | 35 | 1 | 2 | 521 |

**HYPOYHESIS Ho**: There is no significance effect between propotion of disease of a religion having disease no. 11, 13, 15, 23, 33, 36, 48 & 68.

**Chi-Square Tests**

| | Value | df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 28.108(a) | 24 | .256 |
| Likelihood Ratio | 22.590 | 24 | .544 |
| Linear-by-Linear Association | 1.161 | 1 | .281 |
| N of Valid Cases | 521 | | |

a 25 cells (69.4%) have expected count less than 5. The minimum expected count is .06.

**CONCLUSION:** Here we conclude that Religion has no effect at 5% level of significance having disease number 11, 13, 15, 23, 33, 36, 48 & 68.

## Table-61

**DIESEAS * AGE_GR**

**Crosstab**
**Count**

| | | AGE_GR | | | | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | | < 20 | 20 - 30 | 30 - 40 | 40 - 50 | 50 - 60 | 60 - 70 | > 70 | |
| DIESEAS | 11 | | 1 | 6 | 9 | 22 | 10 | 6 | 54 |
| | 13 | | 4 | 22 | 33 | 24 | 10 | 4 | 97 |
| | 15 | | 3 | 15 | 20 | 16 | 4 | | 58 |
| | 17 | 1 | 2 | 21 | 32 | 26 | 11 | 2 | 95 |
| | 23 | | | 6 | 13 | 18 | 7 | 6 | 50 |
| | 33 | | | 1 | 7 | 12 | 11 | 1 | 32 |
| | 36 | | | 3 | 11 | 15 | 14 | 8 | 51 |
| | 48 | | 1 | 2 | 10 | 12 | 12 | 5 | 42 |
| | 68 | 1 | 4 | 7 | 14 | 9 | 1 | 6 | 42 |
| Total | | 2 | 15 | 83 | 149 | 154 | 80 | 38 | 521 |

**HYPOTHESIS Ho:** There is no significant effect of the propotion of the disease of the different Age-group having disease number 11, 13, 15, 23, 33, 36, 48 & 68.

**Chi-Square Tests**

| | Value | df | Asymp. Sig. (2-sided) |
|---|---|---|---|
| Pearson Chi-Square | 100.782(a) | 48 | .000 |
| Likelihood Ratio | 107.157 | 48 | .000 |
| Linear-by-Linear Association | 4.939 | 1 | .026 |
| N of Valid Cases | 521 | | |

a 26 cells (41.3%) have expected count less than 5. The minimum expected count is .12.

**CONCLUSION:** Here we conclude that there is significant effect of the propotion of the disease of the different Age-group having disease number 11, 13, 15, 23, 33, 36, 48 & 68.

## General Conclusion: For Chi-Square Test:

(1)Here we conculed that they have the same Propotion of occurance of calisenoma/diseases of a persons having age-group below & equal to 40 and age-group above 40.
(2)Here we conculed that they have the same Propotion of occurance of calisenoma/diseases of a persons having different Martial-Status like unmarried, married, widowed, divoced.
(3) Here we conculed that they have the same Propotion of occurance of calisenoma/diseases of a persons having different religions like Hindu, Muslim, Jain, Christian and Sikh.
(4) Here we conculed that they have the differnt Propotion of occurance of calisenoma/diseases whether persons are male or female.
(5) Here we conculed that they have the differnt Propotion of occurance of calisenoma/diseases of a persons having different Mother-tongue like Gujarati, Hindi and other.
(6) Here we conculed that they have the differnt Propotion of occurance of calisenoma/diseases of a persons having age-groups like below 20, 20-30, 30-40,40-50, 60-70 and above 70.

## Table-62 T-Test

**Group Statistics**

| | GENDER | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| DIESEAS | Male | 279 | 30.30 | 17.829 | 1.067 |
| | Female | 242 | 19.83 | 13.208 | .849 |

**HYPOTHESIS Ho:** There is no significance difference between male and female of a person having disease number 11, 13, 15, 23, 33, 36, 48 & 68 as far as occurance of calsenoma/disease is concered.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 60.015 | .000 | 7.522 | 519 | .000 | 10.47 | 1.392 | 7.739 | 13.210 |
| | Equal variances not assumed | | | 7.680 | 506.963 | .000 | 10.47 | 1.364 | 7.795 | 13.154 |

**CONCLUSION:** Here tcal=7.522 &ttab= 1.96 at 5%level of significance and d.f. =519. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between male and female of a person as far as occurance of calsenoma/disease is concered.

## Table-63 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | GENDER | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Male | 603 | 34.84 | 19.458 | .792 |
| | Female | 406 | 27.77 | 19.091 | .947 |

**HYPOTHESIS Ho**: There is no significance difference between male and female of a person having disease number 1 to 76 as far as occurance of calsenoma/disease is concered.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .753 | .386 | 5.703 | 1007 | .000 | 7.07 | 1.240 | 4.638 | 9.504 |
| | Equal variances not assumed | | | 5.724 | 880.031 | .000 | 7.07 | 1.235 | 4.646 | 9.495 |

**CONCLUSION:** Here tcal=5.703 &ttab= 1.96at 5%level of significance and d.f. = 519. tcal > ttab Reject the hypothesis. And we conclude that there is significance difference between male and female of a person having disease number 1 to 76 as far as occurance of calsenoma/disease is concered.

# Table-64 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | MAR_STAT | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Unmarried | 63 | 28.79 | 20.328 | 2.561 |
| | Married | 861 | 32.11 | 19.513 | .665 |

**HYPOYHESIS Ho:** There is no significance difference between Unmarried and married of a person as far as occurance of calsenoma/disease is concered.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .061 | .806 | -1.297 | 922 | .195 | -3.31 | 2.554 | -8.324 | 1.700 |
| | Equal variances not assumed | | | -1.252 | 70.619 | .215 | -3.31 | 2.646 | -8.589 | 1.964 |

**CONCLUSION:** Here tcal=-1.297 &ttab=1.96 at 5%level of significance and d.f. =922. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between Unmarried and married of a person as far as occurance of calsenoma/disease is concered.

# Table-65 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | MAR_STAT | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Unmarried | 63 | 28.79 | 20.328 | 2.561 |
| | Widowed | 80 | 33.11 | 19.988 | 2.235 |

**HYPOTHESIS Ho:** There is no significance difference between Unmarried and widowed of a person as far as occurance of calsenoma/disease is concered.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .040 | .842 | -1.273 | 141 | .205 | -4.32 | 3.392 | -11.025 | 2.387 |
| | Equal variances not assumed | | | -1.271 | 132.205 | .206 | -4.32 | 3.399 | -11.042 | 2.405 |

**CONCLUSION:** Here tcal=-1.273 &ttab=1.96 at 5%level of significance and d.f. =141. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between Unmarried and widowed of a person as far as occurance of calsenoma/disease is concered.

# Table -66 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | MAR_STAT | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Unmarried | 63 | 28.79 | 20.328 | 2.561 |
| | Divorced | 5 | 36.20 | 23.488 | 10.504 |

**HYPOTHESIS Ho:** There is no significance difference between Unmarried and divorced of a person as far as occurance of calsenoma/disease is concered.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .022 | .883 | -.776 | 66 | .440 | -7.41 | 9.540 | -26.454 | 11.641 |
| | Equal variances not assumed | | | -.685 | 4.489 | .527 | -7.41 | 10.812 | -36.179 | 21.367 |

**CONCLUSION:** Here tcal=-.776 &ttab= 1.96 at 5%level of significance and d.f. =66. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between Unmarried and divorced of a person as far as occurance of calsenoma/disease is concered.

# Table-67 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | MAR_STAT | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Married | 861 | 32.11 | 19.513 | .665 |
| | Widowed | 80 | 33.11 | 19.988 | 2.235 |

**HYPOTHESIS Ho:** There is no significance difference between married and widowed of a person as far as occurance of calsenoma/disease is concered.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .327 | .568 | -.441 | 939 | .660 | -1.01 | 2.285 | -5.492 | 3.478 |
| | Equal variances not assumed | | | -.432 | 93.543 | .667 | -1.01 | 2.332 | -5.636 | 3.623 |

**CONCLUSION:** Here tcal=-.441 &ttab= 1.96 at 5%level of significance and d.f. =939. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between married and widowed of a person as far as occurance of calsenoma/disease is concered.

# Table-68 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | MAR_STAT | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Married | 861 | 32.11 | 19.513 | .665 |
| | Divorced | 5 | 36.20 | 23.488 | 10.504 |

**HYPOTHESIS Ho:** There is no significance difference between married and divorced of a person as far as occurance of calsenoma/disease is concered.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .057 | .811 | -.467 | 864 | .640 | -4.09 | 8.761 | -21.289 | 13.101 |
| | Equal variances not assumed | | | -.389 | 4.032 | .717 | -4.09 | 10.525 | -33.226 | 25.037 |

**CONCLUSION:** Here tcal=-.467 & ttab= 1.96 at 5% level of significance and d.f. = 864. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between married and divorced of a person as far as occurance of calsenoma/disease is concered.

# Table-69 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | MAR_STAT | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Widowed | 80 | 33.11 | 19.988 | 2.235 |
| | Divorced | 5 | 36.20 | 23.488 | 10.504 |

**HYPOTHESIS Ho:** There is no significance difference between widowed and divorced of a person as far as occurance of calsenoma/disease is concered.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .008 | .928 | -.332 | 83 | .741 | -3.09 | 9.298 | -21.581 | 15.406 |
| | Equal variances not assumed | | | -.287 | 4.370 | .787 | -3.09 | 10.739 | -31.935 | 25.760 |

**CONCLUSION:** Here tcal=-.332 & ttab= 1.99 at 5%level of significance and d.f. =83. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between widowed and divorced of a person as far as occurance of calsenoma/disease is concered.

# Table- 70 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | LANG | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Gujarati | 822 | 31.80 | 19.592 | .683 |
| | Hindi | 167 | 32.47 | 19.403 | 1.501 |

**HYPOTHESIS Ho:** There is no significance difference between persons having different mother tongue (Gujarati &Hindi) as far as occurrence of cailsenoma/disease are concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .031 | .860 | -.405 | 987 | .685 | -.67 | 1.660 | -3.931 | 2.586 |
| | Equal variances not assumed | | | -.408 | 239.809 | .684 | -.67 | 1.650 | -3.922 | 2.577 |

**CONCLUSION:** Here tcal=-.405 & ttab=1.96 at 5%level of significance and d.f. =987. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between different mother tongue (Gujarati & Hindi) as far as occurance of calsenoma/disease is concered.

# Table-71 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | LANG | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Gujarati | 822 | 31.80 | 19.592 | .683 |
| | Other | 20 | 36.20 | 22.503 | 5.032 |

**HYPOTHESIS Ho:** There is no significance difference between persons having different mother tongue (Gujarati & Other) as far as occurrence of cailsenoma/disease are concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 1.808 | .179 | -.989 | 840 | .323 | -4.40 | 4.450 | -13.134 | 4.335 |
| | Equal variances not assumed | | | -.866 | 19.707 | .397 | -4.40 | 5.078 | -15.002 | 6.203 |

**CONCLUSION:** Here tcal=-.989 & ttab= 1.96 at 5%level of significance and d.f. =840. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between different mother tongue (Gujarati &Other) as far as occurance of calsenoma/disease is concered.

# Table-72 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | LANG | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Hindi | 167 | 32.47 | 19.403 | 1.501 |
| | Other | 20 | 36.20 | 22.503 | 5.032 |

**HYPOTHESIS Ho:** There is no significance difference between persons having different mother tongue (Hindi & Other) as far as occurrence of cailsenoma/disease are concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 1.718 | .192 | -.798 | 185 | .426 | -3.73 | 4.672 | -12.944 | 5.490 |
| | Equal variances not assumed | | | -.710 | 22.514 | .485 | -3.73 | 5.251 | -14.603 | 7.149 |

**CONCLUSION:** Here tcal=-.798 &ttab= at 1.96 5%level of significance and d.f. =185. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between different mother tongue (Hindi & Other) as far as occurance of calsenoma/disease is concered.

# Table-73 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Hindu | 936 | 31.81 | 19.432 | .635 |
| | Muslim | 69 | 33.61 | 21.537 | 2.593 |

**HYPOTHESIS Ho:** There is no significance difference between religions (Hindu&Muslim) of persons as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 3.410 | .065 | -.738 | 1003 | .461 | -1.80 | 2.443 | -6.597 | 2.990 |
| | Equal variances not assumed | | | -.675 | 76.386 | .501 | -1.80 | 2.669 | -7.119 | 3.513 |

**CONCLUSION:** tcal=-.738 &ttab=1.96 at 5%level of significance and d.f. =1003. tcal< ttab accept the hypothesis. Here we conclude that there is no significance difference between religions (Hindu&Muslim) of a person as far as occurance of calsenoma/disease is concered.

# Table-74 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Hindu | 936 | 31.81 | 19.432 | .635 |
| | Jain | 1 | 68.00 | . | . |

**HYPOTHESIS Ho:** There is no significance difference between religions (Hidu&Jain) of persons as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | . | . | -1.862 | 935 | .063 | -36.19 | 19.442 | -74.350 | 1.961 |
| | Equal variances not assumed | | | . | . | . | -36.19 | . | . | . |

**CONCLUSION:** Here tcal=-.1.862 & ttab=1.96 at 5%level of significance and d.f. =935. tcal< ttab accept the hypothesis. Here we conclude that there is no significance difference between religions (Hindu&Jain) of a person as far as occurance of calsenoma/disease is concered.

# Table- 75 T-Test

**Group Statistics**

| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| DIESEAS | Hindu | 936 | 31.81 | 19.432 | .635 |
| | Sikh | 1 | 65.00 | . | . |

**HYPOTHESIS Ho:** There is no significance difference between religions (Hindu&Sikh) of persons as far as occurrence of cailsenoma/disease is concerned.

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | . | . | -1.707 | 935 | .088 | -33.19 | 19.442 | -71.350 | 4.961 |
| | Equal variances not assumed | | | . | . | . | -33.19 | . | . | . |

**CONCLUSION:** Here tcal=-.1.707 & ttab=1.96 at 5%level of significance and d.f. =935. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between religions (Hindu&Sikh) of a person as far as occurance of calsenoma/disease is concered.

# Table-76 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Hindu | 936 | 31.81 | 19.432 | .635 |
| | Christian | 2 | 32.50 | 21.920 | 15.500 |

**HYPOTHESIS Ho:** There is no significance difference between religions (Hindu&Christian) of persons as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .027 | .870 | -.050 | 936 | .960 | -.69 | 13.757 | -27.693 | 26.304 |
| | Equal variances not assumed | | | -.045 | 1.003 | .972 | -.69 | 15.513 | -196.252 | 194.863 |

**CONCLUSION:** Here tcal=-.050 &ttab=1.96 at 5%level of significance and d.f. =936. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between religions of persons as far as occurance of calsenoma/disease is concered.

# Table-77 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Muslim | 69 | 33.61 | 21.537 | 2.593 |
| | Jain | 1 | 68.00 | . | . |

**HYPOTHESIS Ho:** There is no significance difference between religions (Muslim&Jain) of persons as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | . | . | -1.585 | 68 | .118 | -34.39 | 21.693 | -77.679 | 8.896 |
| | Equal variances not assumed | | | . | . | . | -34.39 | . | . | . |

**CONCLUSION:** Here tcal=-.1.585 & ttab=2.00 at 5%level of significance and d.f. =68. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between religions (Muslim&Jain) of persons as far as occurance of calsenoma/disease is concered.

# Table-78 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Muslim | 69 | 33.61 | 21.537 | 2.593 |
| | Sikh | 1 | 65.00 | . | . |

**HYPOTHESIS Ho:** There is no significance difference between religions (Muslim&Sikh) of persons as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| DIESEAS | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| | Equal variances assumed | . | . | -1.447 | 68 | .152 | -31.39 | 21.693 | -74.679 | 11.896 |
| | Equal variances not assumed | | | . | . | . | -31.39 | . | . | . |

**CONCLUSION:** Here tcal=-.1.447 & ttab=2.00 at 5%level of significance and d.f. =68. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between religions (Muslim&Sikh) of persons as far as occurance of calsenoma/disease is concered.

# Table-79 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Muslim | 69 | 33.61 | 21.537 | 2.593 |
| | Christian | 2 | 32.50 | 21.920 | 15.500 |

**HYPOTHESIS Ho:** There is no significance difference between religions (Muslim&Christian) of persons as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | .238 | .627 | .072 | 69 | .943 | 1.11 | 15.452 | -29.718 | 31.935 |
| | Equal variances not assumed | | | .071 | 1.057 | .955 | 1.11 | 15.715 | -174.939 | 177.157 |

**CONCLUSION:** Here tcal=.702 & ttab=2.00 at 5% level of significance and d.f. =69. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between religions of persons as far as occurance of calsenoma/disease is concered.

# Table-80 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | Jain | 1 | 68.00 | . | . |
| | Christian | 2 | 32.50 | 21.920 | 15.500 |

**HYPOTHESIS Ho:** There is no significance difference between religions (Jain&Christian) of persons as far as occurrence of cailsenoma/disease is concerned.

**Independent Samples Test**

| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | . | . | 1.322 | 1 | .412 | 35.50 | 26.847 | -305.621 | 376.621 |
| | Equal variances not assumed | | | . | . | . | 35.50 | . | . | . |

**CONCLUSION:** Here tcal = 1.322 & ttab=12.71 at 5%level of significance and d.f. =1. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between religions (Jain&Christian) of persons as far as occurance of calsenoma/disease is concered.

## Table-81 T-Test

**Group Statistics**

| | RELIGION | N | Mean | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|---|
| DIESEAS | Sikh | 1 | 65.00 | . | . |
| | Christian | 2 | 32.50 | 21.920 | 15.500 |

**HYPOTHESIS Ho:** There is no significance difference between religions (Sikh&Christian) of persons as far as occurrence of cailsenoma/disease is concerned.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | . | . | 1.211 | 1 | .440 | 32.50 | 26.847 | -308.621 | 373.621 |
| | Equal variances not assumed | | | . | . | . | 32.50 | . | . | . |

**CONCLUSION:** Here tcal =1.211 & ttab=12.71 at 5% level of significance and d.f. =1.tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between religions (Sikh&Christian) of a person as far as occurance of calsenoma/disease is concered.

## Table-82 T-Test

| Group Statistics | | | | | |
|---|---|---|---|---|---|
| | AGE_GR2 | N | Mean | Std. Deviation | Std. Error Mean |
| DIESEAS | <= 40 | 253 | 30.06 | 20.598 | 1.295 |
| | > 40 | 756 | 32.65 | 19.240 | .700 |

**HYPOTHESIS Ho:** Average number of patients in the below and equal to 40 age Group is same as the above 40 age Group.

| Independent Samples Test | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | |
| | | F | Sig. | t | df | Sig. (2-tailed) | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | | | | Lower | Upper |
| DIESEAS | Equal variances assumed | 3.542 | .060 | -1.820 | 1007 | .069 | -2.59 | 1.423 | -5.381 | .203 |
| | Equal variances not assumed | | | -1.759 | 408.999 | .079 | -2.59 | 1.472 | -5.482 | .305 |

**CONCLUSION:** Here tcal =-1.82 & ttab=1.96 at 5%level of significance and d.f. =1007. tcal< ttab accept the hypothesis. And we conclude that there is no significance difference between below and equal to 40 age group and above 40.

## General Conclusion for T-Test:

(1) Here we conculed that they have the same chances of occurance of cailsenoma/diseases whether persons have below 40 & equal to 40 Age group and above 40 age group.

(2) Here we conculed that they have the same chances of occurance of Cailsenoma/diseases whether persons are male or female of diseases Number 11, 13, 15, 23, 33, 36, 48 & 68.

(3) Here we conculed that they have the different chances of occurance of Cailsenoma/diseases whether persons are male or female of diseases Number 1 to 76.

(4) Here we conculed that they have the same chances of occurance of Calisenoma/diseases whether persons are different martial-status Like unmarried, married, widowed, divoced.

(5) Here we conculed that they have the same chances of occuranceof Calisenoma/diseases whether persons are different mother-tongue Like Gujarati, Hindi and other.

(6) Here we conculed that they have the same chances of occurance of Calisenoma/diseases whether persons are different religions like Hindu, Muslim, Jain, Christian and Sikh.

## Table 83

**Block 1: Method = Enter**

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 41.732 | 2 | .000 |
| | Block | 41.732 | 2 | .000 |
| | Model | 41.732 | 2 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 379.520(a) | .041 | .119 |

An Estimation terminated at iteration number 8 because parameter estimates changed by less than .001.

**Classification Table (a)**

| | | | Predicted | | |
|---|---|---|---|---|---|
| | | | D11 | | Percentage Correct |
| | Observed | | .00 | 1.00 | .00 |
| Step 1 | D11 | .00 | 955 | 0 | 100.0 |
| | | 1.00 | 54 | 0 | .0 |
| | Overall Percentage | | | | 94.6 |

A The cut value is .500

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1(a) | Age | .022 | .010 | 5.133 | 1 | .023 | 1.022 |
| | Male | 2.450 | .599 | 16.738 | 1 | .000 | 11.588 |
| | Constant | -6.003 | .770 | 60.847 | 1 | .000 | .002 |

A Variable(s) entered on step 1: Age, Male.

**Logistic Regression**

**Block 1: Method = Enter**

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 170.373 | 2 | .000 |
| | Block | 170.373 | 2 | .000 |
| | Model | 170.373 | 2 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 468.336(a) | .155 | .331 |

An Estimation terminated at iteration number 8 because parameter estimates changed by less than .001.

**Classification Table (a)**

| Observed | | | Predicted | | |
|---|---|---|---|---|---|
| | | | D13 | | Percentage Correct |
| | | | .00 | 1.00 | .00 |
| Step 1 | D13 | .00 | 912 | 0 | 100.0 |
| | | 1.00 | 97 | 0 | .0 |
| | Overall Percentage | | | | 90.4 |

A The cut value is .500

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1(a) | Age | .004 | .008 | .262 | 1 | .609 | 1.004 |
| | Male | -4.533 | .719 | 39.806 | 1 | .000 | .011 |
| | Constant | -1.389 | .417 | 11.127 | 1 | .001 | .249 |

A Variable(s) entered on step 1: Age, Male.

**Block 1: Method = Enter**

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 157.603 | 2 | .000 |
| | Block | 157.603 | 2 | .000 |
| | Model | 157.603 | 2 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 472.097(a) | .145 | .311 |

Estimation terminated at iteration number 8 because parameter estimates changed by less than .001.

**Classification Table (a)**

| | | | Predicted | | |
|---|---|---|---|---|---|
| | | | D17 | | Percentage Correct |
| | Observed | | .00 | 1.00 | .00 |
| Step 1 | D17 | .00 | 914 | 0 | 100.0 |
| | | 1.00 | 95 | 0 | .0 |
| | Overall Percentage | | | | 90.6 |

A The cut value is .500

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1(a) | Age | .004 | .008 | .238 | 1 | .626 | 1.004 |
| | Male | -4.084 | .592 | 47.662 | 1 | .000 | .017 |
| | Constant | -1.422 | .418 | 11.589 | 1 | .001 | .241 |

A Variable(s) entered on step 1: Age, Male.

| | | | Predicted | | |
|---|---|---|---|---|---|
| | | | D23 | | Percentage Correct |
| | Observed | | .00 | 1.00 | .00 |
| Step 0 | D23 | .00 | 959 | 0 | 100.0 |
| | | 1.00 | 50 | 0 | .0 |
| | Overall Percentage | | | | 95.0 |

A Constant is included in the model.
B The cut value is .500

**Block 1: Method = Enter**

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 6.258 | 2 | .044 |
| | Block | 6.258 | 2 | .044 |
| | Model | 6.258 | 2 | .044 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 391.691(a) | .006 | .019 |

Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

**Classification Table (a)**

| | | | Predicted | | |
|---|---|---|---|---|---|
| | | | D23 | | Percentage Correct |
| | Observed | | .00 | 1.00 | .00 |
| Step 1 | D23 | .00 | 959 | 0 | 100.0 |
| | | 1.00 | 50 | 0 | .0 |
| | Overall Percentage | | | | 95.0 |

A The cut value is .500

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1(a) | Age | .019 | .010 | 3.728 | 1 | .054 | 1.019 |
| | Male | .409 | .318 | 1.653 | 1 | .199 | 1.505 |
| | Constant | -4.227 | .581 | 53.003 | 1 | .000 | .015 |

A Variable(s) entered on step 1: Age, Male.

**Block 1: Method = Enter**

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 26.452 | 2 | .000 |
| | Block | 26.452 | 2 | .000 |
| | Model | 26.452 | 2 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 257.385(a) | .026 | .106 |

Estimation terminated at iteration number 8 because parameter estimates changed by less than .001.

**Classification Table (a)**

| Observed | | | Predicted | | |
|---|---|---|---|---|---|
| | | | D33 | | Percentage Correct |
| | | | .00 | 1.00 | .00 |
| Step 1 | D33 | .00 | 977 | 0 | 100.0 |
| | | 1.00 | 32 | 0 | .0 |
| | Overall Percentage | | | | 96.8 |

A The cut value is .500

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1(a) | Age | .031 | .013 | 5.978 | 1 | .014 | 1.031 |
| | Male | 2.254 | .735 | 9.398 | 1 | .002 | 9.524 |
| | Constant | -6.892 | .985 | 48.966 | 1 | .000 | .001 |

A Variable(s) entered on step 1: Age, Male.

**Block 1: Method = Enter**

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 26.762 | 2 | .000 |
| | Block | 26.762 | 2 | .000 |
| | Model | 26.762 | 2 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 377.074(a) | .026 | .079 |

Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

**Classification Table (a)**

| Observed | | | Predicted | | |
|---|---|---|---|---|---|
| | | | D36 | | Percentage Correct |
| | | | .00 | 1.00 | .00 |
| Step 1 | D36 | .00 | 958 | 0 | 100.0 |
| | | 1.00 | 51 | 0 | .0 |
| | Overall Percentage | | | | 94.9 |

A The cut value is .500

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1(a) | Age | .041 | .011 | 14.977 | 1 | .000 | 1.041 |
| | Male | .921 | .363 | 6.442 | 1 | .011 | 2.511 |
| | Constant | -5.798 | .667 | 75.640 | 1 | .000 | .003 |

A Variable(s) entered on step 1: Age, Male.

**Block 1: Method = Enter**

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 29.131 | 2 | .000 |
| | Block | 29.131 | 2 | .000 |
| | Model | 29.131 | 2 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 320.135(a) | .028 | .097 |

Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

**Classification Table (a)**

| Observed | | | Predicted | | |
|---|---|---|---|---|---|
| | | | D48 | | Percentage Correct |
| | | | .00 | 1.00 | .00 |
| Step 1 | D48 | .00 | 967 | 0 | 100.0 |
| | | 1.00 | 42 | 0 | .0 |
| | Overall Percentage | | | | 95.8 |

A The cut value is .500

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1(a) | Age | .031 | .011 | 7.864 | 1 | .005 | 1.032 |
| | Male | 1.807 | .532 | 11.537 | 1 | .001 | 6.091 |
| | Constant | -6.216 | .786 | 62.528 | 1 | .000 | .002 |

A Variable(s) entered on step 1: Age, Male.

**Block 1: Method = Enter**

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 1.908 | 2 | .385 |
| | Block | 1.908 | 2 | .385 |
| | Model | 1.908 | 2 | .385 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 347.359(a) | .002 | .006 |

Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

**Classification Table (a)**

| Observed | | | Predicted | | |
|---|---|---|---|---|---|
| | | | D68 | | Percentage Correct |
| | | | .00 | 1.00 | .00 |
| Step 1 | D68 | .00 | 967 | 0 | 100.0 |
| | | 1.00 | 42 | 0 | .0 |
| | Overall Percentage | | | | 95.8 |

A The cut value is .500

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1(a) | Age | -.005 | .010 | .291 | 1 | .589 | .995 |
| | Male | .439 | .341 | 1.656 | 1 | .198 | 1.551 |
| | Constant | -3.150 | .551 | 32.641 | 1 | .000 | .043 |

A Variable(s) entered on step 1: Age, Male.

**Block 1: Method = Enter**

**Omnibus Tests of Model Coefficients**

| | | Chi-square | df | Sig. |
|---|---|---|---|---|
| Step 1 | Step | 24.907 | 2 | .000 |
| | Block | 24.907 | 2 | .000 |
| | Model | 24.907 | 2 | .000 |

**Model Summary**

| Step | -2 Log likelihood | Cox & Snell R Square | Nagelkerke R Square |
|---|---|---|---|
| 1 | 419.021(a) | .024 | .069 |

Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

**Classification Table (a)**

| Observed | | | Predicted | | |
|---|---|---|---|---|---|
| | | | D15 | | Percentage Correct |
| | | | .00 | 1.00 | .00 |
| Step 1 | D15 | .00 | 951 | 0 | 100.0 |
| | | 1.00 | 58 | 0 | .0 |
| | Overall Percentage | | | | 94.3 |

A the cut value is .500

**Variables in the Equation**

| | | B | S.E. | Wald | df | Sig. | Exp(B) |
|---|---|---|---|---|---|---|---|
| Step 1(a) | Age | -.017 | .008 | 4.515 | 1 | .034 | .983 |
| | Male | 1.553 | .387 | 16.066 | 1 | .000 | 4.725 |
| | Constant | -3.093 | .513 | 36.311 | 1 | .000 | .045 |

A Variable(s) entered on step 1: Age, Male.

From the above table of the logiestic regression we can estimate proportions of the particular disease for given age & gender of the patients. Following models are developed:

Disease no. 11

Y= .002+11.588(Male) +1.022(Age)

Disease no.13

Y=.249+.011(Male) +1.004(Age)

Disease no. 17

Y=.241+.017+ (Male) +1.019(Age)

Disease no. 23

Y=.015+1.505(Male) +1.019(Age)

Disease no. 33

Y=.001+9.524(Male) +1.031(Age)

Disease no. 36

Y=.003+2.511(Male) +1.041(age)

Disease no. 48

Y=.002+6.091(Male) +1.032(Age)

Disease no. 68

Y=.043+1.551(Male) +.995(Age)

Disease no. 15

Y=.045+4.725(Male) +.983(Age)

# CHAPTER 6

# Concluding Remark and Future Prospects

# CHAPTER 6 CONCLUDING REMARK AND FUTURE PROSPECTS:

## (6.1) Concluding Remark:

In this thise the attempts have been made to discuss some problems in biomedical statistics.

Some importants conclusions are also derived from secondary data collected from Gujarat cancer research institute (GCRI) Ahmedabad having sample size 1009 from the year 2000-2001,2002-2003,2003-2004,2004-2005 and 2005-2006.

- The diseases are not depending upon the sex whether male or female nither the martial-status, mother-tongue whether Gujarati, Hindi and Other and any age-group whether below 20, 20-30, 30-40, 40-50, 50-60, 60-70 and above 70.
- The diseases are depending upon the religions whether Hindu, Muslim, Jain, Christian and Sikh.
- Propotion of diseases are not depending upon the age group whether person having below & equal to 40 and age group above 40 nither marital-status and religions whether Hindu, Muslim, Jain, Christian and Sikh.
- Propotion of diseases are deponding upon the sex whether male or female nither mother-tongue whether Gujarati, Hindi and Other.
- Cases of Brest cancer is more in year 2000,2002,2003 and 2006 where as cases of cervix cancer is more in year 2004 and 2005.
- Cases of Brest cancer is more in Married and divorced persons where as Cases of Brain cancer is more in unmarried persons and s Cases of Cervix cencer is more in widowed persons.
- Cases of Cervix cancer is more in those persons who know Gujarati language where as Cases of Brest cancer is more in those persons who know non-gujarati language.
- Cases of Base of tongue cancer are more in males where as Cases of Brest cancer is more in females.
- Cases of Cervix cancer are more in Hindu and Christian persons where as Cases of Abdoenimal L.N. is more in Muslim persons,

Cases of secondary sikn cancer are more in Sikh persons and Cases of 68 cancers are more in Jain persons.

- ❖ Cases of Brain cancer is more in persons in the age group below 20 and 20-30 where as Cases of Brest cancer are more in persons having age-group 30-40and 40-50, Cases of Cervix cancer are more in persons having age-group 50-60 and Cases of Lung cancer are more in persons having age-group 60-70 and above 70.

**In this thesis we have use the following statistical methodology:**

1 discriptive statistics like mean median, mode, sd and plot histographs.
2 test of mean (t-test).
3 Analysis of variance
4 independent sample t-tests
5 Test of association and propotion (chi –square tests).
6 Logestic regressions.

There is always scope for improvement in the kind of work under taken in this thesis. Hence we feel that the thesis will be incomplete without a suggestion has to the direction in which future can be carried out.

The work is done for cancer problems but this kind of work can be carried out for many life diseases whose finding will be useful to the Government and Society at large. Many other aspects of cancer diseases van is consider such as size of the tummer and problem of the survival analysis etc... Thus, there is always improvement in the work carried out and there are aempal of future prosecpts in this area.

## (6.2) Future Prospects of the Present Research:

Using a carefully chosen set of examples, illustrating the importance and ubiquity of quantitative reasoning in the biomedical sciences. The examples range across many different levels of biomedical interventions, and problems addressed range from basic to apply. In addition to the overall theme that mathematical and statistical approaches are essential for understanding biomedical systems, three particular and interacting mathematical themes emerge. First nonlinearly is pervasive; second, inclusion of Fourier series and third; issues of scales are common to all applications of quantitative approaches. Future progress in understanding many biomedical systems and events will depend on continued applications and developments in the three areas, and on understanding how nonlinearity WFSA, and scale interact.

Over reliance on Null Hypothesis Significance Test (NHST) is a serious problem in number of disciple, including Biomedical Sciences. It has the potential to damage not only the progress of these sciences but also the objects of their study. In mid 1980s, medical sciences underwent a (relatively) major statistical reform. It saw the number of p values drop dramatically and the rates of confidence interval reporting use concomitantly. In Biomedical Sciences a parallel change is yet to be achieved despite half a century of debate, several inventions, and even an American Association Task Force on Statistical Inference. Biomedical Sciences also lags behind substantially Improvement of software and research understanding of outer rate methods, it seems unlikely that the initiatives will achieve substantial statistical reform.

It is argued that combined models may be necessary for optimally extracting the information from biomedical studies. Out ability to find depends on how & precisely and accurately are able to model the interrelationships. We need these newer models and methods for extracting the information from biomedical data, and we also need to reorient ourselves as to how we interpret the very information extracted. It is projected that path and, segregation analysis, as such in terms of combined models, will be useful in New futuristic research.

Compelling arguments for reform of statistical practices and inferences have been made in many disciplines in some cases over several decades, but achieving reform has proved difficult. Discussion of how reform has progressed or not progressed in Biomedical Sciences and Health Sciences case studies of attempts by pioneering to change statistical inferences and practices. Those seeking reform in Biomedical Sciences included to need to recognize the importance of software that give practical guidance to statistical researchers wishing to use the recommended statistical mathematical techniques. Research is required on recommended techniques so that statistical practice on inferences can become evidence based. Also, improvement in statistical practice on inferences should be encouraged along with improvement in a way a discipline theorizes.

The precautionary principle recommends preventing possible harm to human health. I have gained support in the international community as a higher-order legal principle that should guide public policy and the formulation of specific laws. One can argue that the value of the precautionary principles is that it emphasizes aspects of good decision-making that go beyond the scope of formal decision theory, and are often

neglected in statistical practice. It is best conceived as providing guidelines for formulating a decision problem, as opposed to challenging standard decision rules. To this effect, the statistical principles advocate assessment of acts relative to feasible alternatives (in approximation) and proper representation of all potential outcomes (probabilistic or scientifically uncertain). In terms of determining or estimating suitable outcome utilities and burdens of proof (qualification), the precautionary statistical principles appeals to ideals associated with newer development. Finally outline some general implications of these statistical principles for decision-making in Biomedical Sciences.

# CHAPTER 7

## CASE STUDY

# CHAPTER 7 CASE STUDIES:

## Case Studies in Breast Cancer in ER – PR Positivity:

Desai et al has done study on Hormone receptor status of breast cancer in India: a study of 798 tumors. The objectives of this study were to document the estrogen and progesterone receptor (ER & PR) status of breast cancer in the Indian population (as done by immunohistochemistry on paraffin blocks), and correlate the steroid receptor status of breast cancer with all relevant patient and tumor characteristics. Their current data have been compared with previously published data from other centers. In contrast to the higher rates reported in the Western literature, only 32.6% of our tumors were ER positive and 46.1% were PR positive. Tumors were separated into four categories: ER+PR+ (25%), ER+PR- (7.4%), ER-PR+ (21.1%) and ER-PR- (46.5%). ER and PR immunoreactivity increased with advancing age, and correlated with the presence of elastosis. Infiltrating lobular carcinoma, mucinous carcinoma, and mixed tumors were more frequently ER & PR positive. High-grade infiltrating duct carcinomas, pure comedo ductal carcinoma in situ, and medullary carcinoma were predominantly ER & PR negative. The presence of necrosis and lymphovascular invasion showed an inverse relationship with ER and PR reactivity. [(6)]

Goyle et al analyzed retrospective data of 131 breast cancer patients presenting to their institute between January and December 2007. The patients were staged according to AJCC criteria and were divided into 3 categories: stage I/II, stage III and stage IV. ER, PR and HER2 status was then compared for the 3 categories. Results: Of the 131 breast cancer patients, 77 (59%) presented with stage I/II disease, 45 (34%) with stage III disease and 9 (7%) with stage IV disease. 28 (36%) patients with stage I/II disease were ER/PR/HER2 negative, 11 (25%) with stage III disease were ER/PR/HER2 negative and 2 (22%) with stage IV disease were ER/PR/HER2 negative. Overall 41 (31%) patients were found to be ER/PR/HER2 negative, of which 28 (68%) belonged to stage I/II, 11 (27%) to stage III and 2 (5%) to stage IV disease. Conclusions: From our data we conclude that presence of ER/PR/HER2 negativity does not necessarily correlate with more advanced disease at presentation in our Indian population. [(7)]

Rakesh Chopra did a Case study in which most patients with breast cancer seen at general hospitals and regional cancer centers present with advanced disease. The reported incidence of estrogen receptor (ER) and progesterone receptor (PR) status has been significantly lower than in white women. Navnani et al[2] studied these features in women presenting with breast cancer to the Breach Candy Hospital in Mumbai. This is an exclusive hospital, and the patients present with early-stage disease, unlike those at regional cancer centers. The findings are presented below.

| | Receptor Status | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | ER+PR+ | | ER+PR- | | ER-PR+ | | ER-PR- | |
| | No. | % | No. | % | No. | % | No. | % |
| All (N = 125) | 29 | 23.2 | 24 | 19.2 | 13 | 10.4 | 59 | 47.2 |
| Grade 1 (n = 14) | 5 | 35.7 | 2 | 14.3 | 2 | 14.3 | 5 | 35.7 |
| Grade 2 (n = 47) | 17 | 36.1 | 8 | 17 | 7 | 14.9 | 15 | 32 |
| Grade 3 (n = 64) | 8 | 12.5 | 14 | 21.9 | 4 | 6.3 | 38 | 59.4 |

**The outcome is, the incidence of ER+PR+ tumors was 23.2%; the incidence of ER-PR-**

A tumor was 47.2%. Factors contributing to the high incidence of ER-PR- tumors were high tumor grade and disease/tumor stage in the majority of the women and premenopause status in a large number of the women.[(8)]

Zheng et al has done a study **f**rom February to September in 1994, a total of 58 patients with nasopharyngeal carcinoma (NPC) were testified by pathology. It included 56 poorly differentiated squamous cancers, 1 poorly differentiated adenocarcinoma, and 1 B-cell lymphoma. Clinical staging: II stage 6 cases, III stage 20 cases, IV stage 24 cases, recurrence 8 cases. The results showed that ER and PR positive rate were 26/58 (44.8%) and 28/58 (48.3%). The rate has not relation to the age and sex. There was a contrary relation between ER, PR positive rate and clinical staging and VCA-IgA.

When ER, PR were negative and VCA-IgA was 1□40 in IV stage patients, its accorded rate was 9/12 (75%); when only VCA-IgA was 1□40, accorded rate was 13/33 (39.4%). Total CR was 38/49 (77.6%). When both ER and PR were positive, CR was 79%; when both ER and PR were negative and VCA-IgA was 1□40, CR was 58.3%. We regard NPC is belong to high expression tumor of estrogen and progesterone, and positive expression can reflect tumor developing tendency and relate to recent prognosis. The paper suggests that it isPossible to treat NPC with the endocrine therapy. Examining ER, PR and VCA-IgA together can improve the analysis of the prognosis of NPC. (9

Biesterfelds et al has done study on Simultaneous immunohistochemical and biochemical hormone receptor assessment in breast cancer provides complementary prognostic information.The prognostic value of the biochemical and the immunohistochemical assessment of estrogen- and progesterone receptor (ER PR) status were tested in 111 breast cancer patients, mostly focusing on whether the results reveal complementary prognostic Information. The biochemical receptor analysis was performed on snap-frozen tumor tissue using a standard protocol (ER-DCC, PR-DCC). The immunhistochemical staining was done on 4 μm thick paraffin sections and was evaluated semiquantitatively (ER-IHC, PR-IHC) and immunohistometrically by means of image analysis (ERMEAN, PRMEAN). 74% of the ER-DCC and 50% of the PR-DCC assays were interpreted as positive. The positivity rates of the immunohistochemical reactions ranged between 78% and 81% for ER and between 66% and 82% for PR, depending on the interpretation mode. The concordance rate for the DCC method was 68%, and ranged between 77% and 85% for the immunohistochemical results on paraffin sections. ER-DCC and PR-DCC showed a better survival for receptor-positive patients; however, this tendency was only statistically significant for the PR-DCC ($p = 0.0294$). Patients with immunohistochemically determined ER- or PR-positivity revealed a significantly better survival than receptor-negative patients, the effect being stronger for the progesterone receptor (ER: $p = 0.0253$, PR: $p = 0.0005$). Combining the different methods and receptors in a multivariate analysis, we observed that a) ER and PR reveal complementary prognostic information to each other after immunohistochemical determination ($p \leq 0.0018$) and that, b) complementary prognostic information was also obtainable by comparing the biochemical and the immunohistochemical PR-analysis ($p \leq 0.0084$); slightly more significant results were obtained for

ERMEAN and PRMEAN compared to ER-IHC and PR-IHC. Considering the lymph node status and a combined receptor analysis (PR-DCC, ERMEAN, PRMEAN) as the two strongest prognosticators in multivariate Cox models, the combined receptor analysis was able to discover for each of the three groups of NO- and N1-patients different survival probabilities ($p<0.0001$). In conclusion the ER-DCC appears to be dispensable in all patients. In lymph node-negative patients, the PR-DCC has no outstanding merit, indicating that the necessity of this method is also controversial. In primary tumors of lymph node-positive patients, however all three remaining types of receptor analysis should be evaluated for their therapeutic implications. **(10)**

Wang B et al has done study on .discordance of estrogen receptor (ER), progestin receptor (PR), and HER-2 receptor statuses between primary and metastatic focuses of breast cancer. Hormone and Herceptin therapy for metastatic breast cancer is commonly based on expression of estrogen receptor (ER) and progestin receptor (PR), and over-expression of HER-2 in primary breast cancer, but studies comparing receptor statuses in primary and metastatic focuses of the same patient are limited. This study was designed to investigate discordance of ER, PR, and HER-2 statuses between primary and metastatic focuses of breast cancer. METHODS: Immunohistochemistry assay was used to detect expression of ER, PR, and HER-2 receptor in primary and metastatic focuses of 65 cases of breast cancer. RESULTS: Positive rate of ER in primary focuses was 56.9% (37/65), significantly higher than that in metastatic focuses (33.8%, 22/65)($P< 0.01$); while positive rates of PR and HER-2 receptor have no significant difference between primary and metastatic focuses. Total discordance rates of ER, PR, and HER-2 were 35.4%, 29.2%, and 16.9%, respectively. Difference in expression level of ER between primary and metastatic focuses of breast cancer was significant, while differences of expression of PR, and HER-2 wasn't significant, but we still should think highly of the expression differences of ER,PR, and HER-2 in our clinical pr clinical practices.**(11)**

**GAJALAKSHMI** et al has done a population-based survival study on female breast cancer in Madras, India.
Breast cancer is the second most common cancer among women in Madras and southern India after cervix cancer. The Madras Metropolitan Tumor Registry (MMTR), a population-based cancer registry, collects data on the

outcome of cancer diagnosis by both active and passive methods. A total of 2080 cases of invasive female breast cancer were registered in MMTR during 1982-89. Of these, 98 (4.7%) cases were registered on the basis of death certificate information only (DCO), and there was no follow-up information for 235 (11.3%). These were excluded, leaving 1747 (84%) for survival analysis. The mean follow-up time was 43 months. The overall Kaplan-Meier observed survival rates at 1, 3 and 5 years were 80%, 58% and 48% respectively; the corresponding figures for relative survival were 81%, 61% and 51%. A multifactor analysis of prognostic factors using a proportional hazards model showed statistically significant differences in survival for subjects in different categories of age at diagnosis, marital status, educational level and clinical extent of disease. Increasing age at diagnosis was associated with decreased survival. Single women displayed poorer survival (37.4%) at 5 years than those married and living with spouses (50.0%). The survival rate among those who had more than 12 years of education was higher (70%) at 5 years than that of illiterate subjects (47%). An inverse relationship was seen between survival rates and clinical extent of disease. The need for research to determine feasible public health approaches, allied to coordinated treatment facilities to control breast cancer in India, is emphasized. **(12)**

## Case studies on Survival Analysis of Cervix Cancer:

Yeole et al have done a study on Survival from breast and cervical cancer in Mumbai (Bombay), India. This paper is reported on the survival of breast and cervical cancer patients registered during 1982-86 in Bombay Cancer Registry. A total of 2872 breast cancer and 2354 cervical cancer cases were registered for survival analysis. Details on marital status, mother tongue, religion, education, and clinical extent of disease were available for these cases. Information is obtained from 168 hospitals and clinics in the public and private sector using a structured form. Overall, analytical results represent an average prognosis from breast and cervical cancers in the country. Age group, marital status and clinical extent of disease emerged as significant factors affecting survival in breast and cervical cancer. The clear downward gradient in survival with advanced disease indicates that the classification of the clinical extent of disease was reasonably accurate. Although Mumbai has a level of health services which allows patients reasonable access to diagnostic and therapeutic services, there is a considerable scope for improving outcome by early diagnosis and

treatment. It would also be prudent to consider ways of achieving this at a minimal cost. [13]

Nandkumar et al have done a study on Incidence, mortality and survival in cervix Cancer in Banglore, India.Cancer of the cervix is the most common cancer among women in India constituting between one sixth to one half of all female cancers with an age adjusted incidence rate ranging from19.4 to 43.5 per 100,000 in the registries under the National Cancer Registry Program (NCRP). (Annual reports, NCRP, ICMR).It has been estimated that 100,000 new cases of cancer of the cervix occur in India every year, and 70% or more of these are Stage-III or higher at diagnosis. However, the incidence of cancer of the cervix as suggested in this report appears to be on the decline in Banglore. Besides incidence and clinical stage at presentation knowledge of survival is essential to complete the picture of establishing baseline indicators to monitor and evaluate cancer control programs. Survival analysis was carried out on 2121 patients diagnosed during 1982-89 in Banglore, India. They observed that 5- year survival was 34.4% and the relative survival was 38.3%. Clinical stage at presentation was the single most important variable in predicting survival. The 5 year observed survival for stage I disease was 63.3%, for stage II was 44.0%, for stage III was 30.3% and for stage IV was 5.7 %.[ 14]

Sriamporn et al studied on Loss-adjusted survival of cervix cancer in Khon Kaen, Northeast Thailand
For incident cancers of the cervix uteri (601 cases) registered in the population-based cancer registry of Khon Kaen province, Northeast Thailand, in 1985–1990 where loss-adjusted survival probabilities were estimated by a logistic regression model with four prognostic factors (age at diagnosis, stage of disease, place of residence and treatment), and compared with observed survival, estimated by the actuarial method. All patients were followed up for a minimum of 5 years, using both passive and active methods. In all, 27.6% of patients were lost to follow-up within 5 years of the index date. The overall observed survival at 5 years was 56.8% and loss-adjusted survival was 54.7%. The difference between the loss-adjusted and observed survival at 5 years was small: 2.1% overall, varying between 0.8 and 3.5 percent units for any prognostic group. The assumption of independence of loss to follow-up and death in the calculation of survival by the actuarial method in this, and probably in

other, population-based series, is reasonable and leads to no material bias in the estimates. [15]

- **SANKARANARAYANAN** et al further studied studied on cervical cancer in Kerala: a hospital registry-based study on survival and prognostic factors. The survival experience of 452 cervical cancer patients were registered during 1984 and noted in the hospital registry of the Regional Cancer Centre, Trivandrum, and Kerala, India. In that hospital, eighty per cent of the patients completed the prescribed treatment, which was predominantly radiotherapy. The vital status of each patient was established by scrutiny of case records and by reply-paid postal enquiries. The observed survival rates were estimated by the Kaplan-Meier method and prognostic factors were assessed using Cox's proportional hazards regression analysis. The overall 5 year observed survival rate was 47.4%.It has been found that the 95% of Confidence Interval was between 41.6 to 52.9%.Next socioeconomic status, performance status and the clinical stage of disease emerged as independent predictors of survival. Low survival was associated with advanced stages of disease, low socioeconomic status and poor performance status. It is stressed that trends in survival rates may be used to evaluate cancer control programs in Developing countries in the absence of reliable mortality statistics and, even when mortality data are available, survival rates are valuable comparative statistics. Earlier detection by improving the awareness of the population and the physicians will improve survival rates, but a more effective and prudent approach would be to prevent invasive cervical cancer, and thereby reduce mortality, by implementing feasible and effective screening programs in India. [16]

## Case Study

Case Study: Elderly patients with early non-small cell lung cancer: What are the benefits and harms of adjuvant platinum-based chemotherapy?

## More In Lung Cancer

- A prospective perspective: The iTARGET trial and gefitinib therapy for NSCLC in patients with known mutations of the EGFR
- Case Study: EGFR-directed therapy optimizes responses in patients with NSCLC harboring EGFR mutations
- EGFR-directed therapy optimizes responses in patients with NSCLC harboring EGFR mutations

- Improving survival rates in lung cancer
- Adjuvant therapy for early-stage non-small cell lung cancer: Recent reports and their implications

**Tags**

- Case Study
- Cancer
- Lung Cancer

**In August 2004,** a 73-year-old Caucasian female underwent a routine chest x-ray because of a prolonged dry cough following a viral infection. A 4-cm peripheral mass in the left upper lung lobe was discovered. Further workup including a CT-guided transthoracic biopsy revealed a moderately differentiated adenocarcinoma of the lung that was highly positive for thyroid transcription factor 1 (TTF-1) staining on immunohistochemistry. A PET-CT showed avid fluorodeoxyglucose (FDG) uptake of the tumor and a 2-cm left hilar lymph node with no evidence of any distant metastases. Mediastinoscopy and MRI of the brain wasNegative.

Her past medical history was unremarkable except for a remote smoking history of 20 pack-years ending 35 years ago, an 8-year history of hypertension, and mild arthritis of her knees. Her ECOG performance status was 1, and she did not complain of any weight loss. She had normal pulmonary function tests and routine laboratory results.

She was considered to be an operable candidate and successfully underwent left upper lobectomy with hilar and mediastinal lymph node dissection. The pathological specimen showed a completely resected adenocarcinoma, 5.2-cm in size with one positive hilar lymph node (pT2 pN1 M0 G2, stage IIB).

Six weeks after surgery the patient had recovered fully except for ongoing shortness of breath when climbing a single flight of stairs. Given her good recovery, she was scheduled for four cycles of adjuvant chemotherapy with cisplatin and vinorelbine. She experienced prolonged neutropenia during the first cycle, which led to the use of granulocyte colonystimulating factor in the following cycles. On her visit for the second cycle, she complained of grade 2 asthenia and intermittent mild tinnitus of the right ear but was willing to continue treatment. Chemotherapy was discontinued after three

cycles at the patient's request after an episode of diarrhea, which required short-term hospitalization during the third cycle. The patient continues to do well today, 4 years after her initial diagnosis, with no sequelae from her treatment.

## Case 152 -- Right Upper Quadrant Mass

Pediatric Pathology

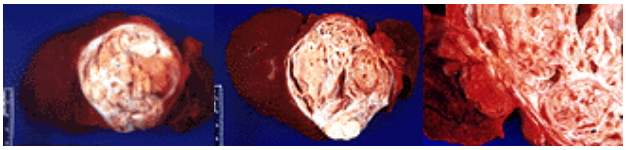
**PATIENT HISTORY:**

A two year old white female was seen for a routine well child examination. On physical examination, a right upper quadrant mass was palpable. Serum alpha fetoprotein was 44,240 ng/mL at the time of admission.

**RADIOLOGIC FINDINGS:**

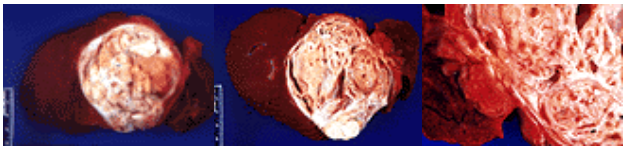
The scout film (Image 01) from the CT scan revealed a heterogeneous intrahepatic mass which extended through the diaphragm into the right lower thoracic cavity. The axial non-contrast enhanced CT scan showed a heterogeneous intrahepatic mass (Image 02) with areas containing fibroadipose tissue, soft tissue, and calcifications. At the level of the heart (Image 03), the CT scan showed a right sided paraspinal mass which on adjacent sections was in continuity with the intrahepatic mass.

**GROSS DESCRIPTION:**



The right lobe of the liver, gallbladder, a portion of the diaphragm, and a wedge resection of the right lower lobe of the lung were received, measuring in total 14.5 x 10.0 x 6.0 cm, 530 grams. The right lobe of the liver was distorted by a 10.0 x 8.5 x 5.5 cm well circumscribed mass covered with a thick fibrous capsule. The capsule of the mass abutted the capsule of the liver. A portion of the diaphragm was firmly adherent to the surface of the right lobe of the liver. A resected wedge of lung was adherent to the diaphragm. On cut section, the mass in the right lobe of the

liver (Image 04) was a multicystic tan-white tumor with cysts ranging up to 3.0 cm in greatest dimension. Some cysts contained yellow, clear fluid, while other cysts contained mucinous tan-white material. Fragments of cartilage and bone (Image 05) were identified in the tan-white fibroconnective tissue between cysts. Some cysts contained yellow caseous debris and pieces of hair. Foci of black retinal pigment were present. On cut section, a poorly circumscribed, yellow-white, focally hemorrhagic, soft friable, tumor (Image 06), 4.5 x 3.5 x 3.0 cm, extended from the edge of the main tumor mass in the liver, through the diaphragm into the lung.



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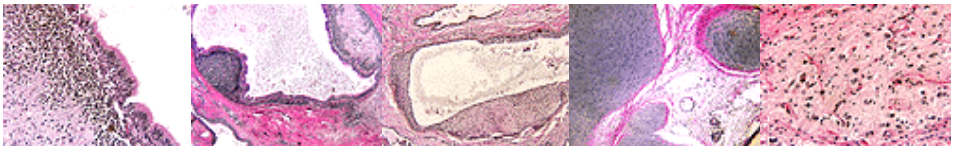
**MICROSCOPIC DESCRIPTION:**

The tumor in the liver was composed of cysts with varied epithelial linings, including ciliated respiratory epithelium, (Images 07, 08) simple squamous epithelium (Image 09), keratinizing stratified squamous epithelium (Image 10), and bone were identified. Mature fibroadipose tissue and neural tissue (Image 11) and bone were identified. Mature fibroadipose tissue and neural tissue (Image 12) were present. Foci of pigmented retinal epithelium were seen. The tumor extending through the diaphragm into the lung showed a reticulated pattern (Image 13) of low cuboidal cells with some papillae intermixed (Images 14, 15). In cross section, these papillae with fibrovascular cores were lined by cuboidal cells forming Schiller-Duval bodies (Image 16). The cuboidal cells had large pleomorphic nuclei with prominent nucleoli. Some had eosinophilic hyaline globules in their cytoplasm. Similar foci of tumor were identified within the liver mass.

Immunoperoxidase staining for alpha fetoprotein showed cytoplasmic staining in several foci of the tumor extending through the diaphragm into the lung (Image 17).



**FINAL DIAGNOSIS Final Diagnosis -- Yolk Sac Carcinoma Arising in a Mature Teratoma of the Liver**

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**FINAL DIAGNOSIS:** YOLK SAC CARCINOMA ARISING IN A MATURE TERATOMA OF THE LIVER.

## Contributor's note:

arcinoma,[5] "malignancies of hepatic and mesodermal components",[6] and malignant neural elements.[7] The most common germ cell malignancy arising in teratomas overall is the endodermal sinus tumor or yolk sac tumor.[8] The most common malignancies arising in mature The term teratoma is derived from the Greek root "teratos" which means monster. This name is applied to neoplasms which are characterized by abnormal growth of a combination of tissues derived from ectodermal, mesodermal, and endodermal germ layers. This combination of tissues is unrelated to the organ in which the tumor is arising. Teratomas have been described in numerous anatomic sites. [1] Most commonly these tumors arise in the ovaries or in the sacrococcygeal region in children.[1] other less common anatomic locations include the testes, mediastinum, and central nervous system. Rare teratomas arising in the gastrointestinal tract, liver, nasal sinuses, uterus, cervix, and thyroid[2] have been reported. The biologic behavior of these neoplasms is also highly variable, some being entirely benign and others undergoing aggressive malignant transformation. Several hypotheses concerning the pathogenesis of these lesions have been suggested. The most commonly espoused hypothesis is that these tumors arise from primordial germ cells and primitive somatic cells which proliferate in an abnormal fashion due to absence of the regulatory influence of unidentified organizers and inducers.[1] the definitive pathogenesis of these neoplasms has yet to be elucidated.

Teratomas of the liver are rare neoplasms accounting for less than 1% of all teratomas. The tumors more commonly occur in pediatric patients but still

only account for less than 1% of all liver neoplasms in pediatric patients.[3] Of the 25 hepatic teratomas described in the literature, [4] only five occurred in adult patients. The majority of described cases were in female children under three years of age, most arising in the right lobe of the liver. Of these cases, only [4] cases had documented malignant degeneration. The reported malignancies arising in hepatic teratomas include squamous cell cteratomas of any site are squamous cell carcinoma and sarcoma. Rare cases of primary yolk sac tumor of the liver have been reported.[9]

The patient described herein represents a unique instance of a hepatic teratoma with a germ cell tumor component, specifically yolk sac carcinoma. On presentation, this patient's serum alpha fetoprotein was markedly elevated and a similar elevation of serum alpha fetoprotein has been described in another case of primary hepatic teratoma.[7] Following resection of the tumor and chemotherapy, the serum alpha fetoprotein has decreased to 4 ng/mL (most recently) and is being used as a tumor marker to screen for tumor recurrence in this patient. At present the patient has no evidence of tumor.

## Molecular Diagnostics -- Abdominal Pain

**MOLECULAR DIAGNOSTICS:**

**INTERPRETATION:**

B-cell lymphoma without Bcl-2 gene rearrangement.

**RESULTS:**

**TESTS:**

Immunoglobulin heavy chain rearrangement
Bcl-2 gene rearrangement
DNA purification

**RESULTS:**

The heavy chain gene shows 2 bands of clonal gene
Rearrangement. The Bcl-2 gene is normal at the mbr and mcr loci.

**COMMENTS:**

The lesion probably contains a single clone of
Neoplastic B-cells with diallelic gene rearrangement. The clonal
B-cells comprise the majority of cells in the tissue specimen.

The absence of Bcl-2 gene rearrangement indicates that this Marker cannot be used for the assessment of dissemination or Residual disease.

## Final Diagnosis -- Primary Hepatic Lymphoma

**FINAL DIAGNOSIS:**
MALIGNANT LYMPHOMA, FOLLICULAR CENTER CELL TYPE, LARGE NONCLEAVED CELL PREDOMINANT, DIFFUSE (WORKING FORMULATION: MALIGNANT LYMPHOMA, DIFFUSE LARGE CELL TYPE).

## CONTRIBUTOR'S NOTE:

Immunophenotypic studies support the diagnosis of a follicular center cell lymphoma. Due to the lack of lymphadenopathy or other organ involement, this was determined to be a primary hepatic lymphoma. Genotypic studies performed on the liver biopsy in the Molecular Diagnostics Laboratory support the diagnosis of a B-cell neoplasm but do not help to further subclassify this lymphoma.

Primary malignant lymphoma of the liver accounts for only 0.4% of all extranodal lymphomas in the US. A recent published series of cases revealed a median patient age of 55 years and a male-to-female ratio of 3.1:1[1]. The most common presenting signs and symptoms were epigastric and right upper quadrant pain, weight loss, fever; the histopathologic sections demonstrate a diffuse large noncleaved follicular center cell lymphoma. There is sclerosis. The flow cytometric night sweats, and hepatomegaly. The majority of patients had elevated liver function tests. All patients in the series had no elevation of either alpha-fetoprotein or carcinoembryonic antigen.

While Hodgkin's disease, non-Hodgkin's lymphoma and various leukemias may secondarily involve the liver, virtually all primary hepatic lymphomas are non-Hodgkin's lymphomas. The majority (88.2%) are classified as Diffuse Type, with just over half (57.4%) further identified as Large Cell Type. Seventy-nine percent of the cases are B-cell lymphomas, 6.9% T-cell lymphomas, and the remainder phenotypically unclassified. The overall two-year survival rate is approximately 66%.

# Case 60 -- Peritonitis

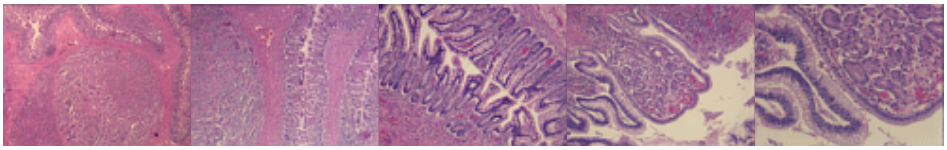
## PATIENT HISTORY:

The patient is a 70 year old male with peritonitis.

## GROSS DESCRIPTION:

Received is a 25.0 cm. segment of small intestine with attached mesentery. The serosal surface is dull with areas of tan-white, purulent exudate. In the mid portion of the serosal surface, there is a 3.0 x 2.3 x 2.0 cm polypoid, pedunculated mass. Opening the bowel reveals a 4.5 cm. uniform circumference. The mucosa is tan and shows normal folds. In the mid portion of the mucosal surface, corresponding with the polypoid mass on the serosa, there is a small raised papilla with a pinpoint lumen which appears to have a tortuous connection with the serosal polypoid mass. The mucosa surrounding the papilla is slightly edematous with focal erosions. Within the wall of the polypoid mass, there is multiple round tan -white nodules noted.

Additionally received is a 4.0 cm. vermiform appendix with attached periappendiceal fat. The serosa is dull with areas of white purulent material. Sectioning reveals no obvious fecalith and the lumen appears patent.



**MICROSCOPIC DESCRIPTION:**

Sections demonstrate a large diverticulum lined by small intestinal mucosa. Focally, ectopic gastric mucosa is identified in the tip of the diverticulum. Beneath the mucosa, in the wall of the diverticulum, there are nodules of basophilic cells. At higher magnification, these cells are forming nests and cords. The nuclei are round and uniform with "salt and pepper" chromatin pattern. There is a moderate amount of amphophilic cytoplasm. Chromogranin stain is positive in these cells.

Diagnosis Final Diagnosis -- Carcinoid tumor arising in a Meckel's diverticulum (Peritonitis)

**FINAL DIAGNOSIS:**

ILEUM, SEGMENTAL RESECTION - CARCINOID TUMOR ARISING IN A MECKEL'S DIVERTICULUM.

Notes:

- Meckel's diverticulum is one of the most common congenital anomalies of the gastrointestinal tract. Most Meckel's diverticuli demonstrate ectopic gastric mucosa. Additionally, one can see pancreatic or colonic mucosa. Symptoms can be related to rupture of the diverticulum, secretion of ectopic gastric or pancreatic hormones, or intussusception (with the diverticulum as the lead point).
- A 1992 review (1) lists 104 cases of carcinoid tumor arising in Meckel's diverticulum reported in the world literature. Most of these showed the tumor present in the tip of the diverticulum. The majority of patients are asymptomatic. A few become symptomatic from the diverticulum and/or the carcinoid tumor itself. Only ten of these cases developed the "carcinoid syndrome". Metastasis of the carcinoid tumor is related to size. Those tumors greater than 2.0 cm all had metastatic foci.

# CHAPTER 8

# REFERENCES

# CHAPTER 8 REFERENCES:

(1) A. Andrade, F Khedive, J. Man gin, K. J. Horsley, A. Paradise, O. Simon, S. Deanne, D. Le Bhang, and J.-B. Polaner, "Detection of fmri activation using cortical surface mapping," Human Brain Map., vol. 12, pp. 79–93, 2001.

(2) A. M. Dale and B. Fischl, "Cortical surface-based analysis i. Segmentation and surface reconstruction," NeuroImage, vol. 9, pp. 179–194, 1999.

(3) A. Kelemen, G. Szekely, and G. Gerig, "Elastic model-based segmentation of 3-d neuroradiological data sets," IEEE Trans. Med. Imag., vol. 18, no. 10, pp. 828–839, Oct. 1999.

(4) A. B. McMillan, B. P. Hermann, S. C. Johnson, R. R. Hansen, M. Seidenberg, and M. E. Meyerand, "Voxel-based morphometry of unilateral temporal lobe epilepsy reveals abnormalities in cerebral white matter," NeuroImage, vol. 23, pp. 167–174, 2004.

(5) A. Qiu, D. Bitouk, and M. I. Miller, "Smooth functional and structural maps on the neocortex via orthonormal bases of the laplace-beltrami operator," IEEE Trans. Medical Imaging, 2006.

(6) A. Schwartz, and M. Hearst, "A Rule Based Algorithm for Identifying Abbreviation Definitions in Biomedical Text Using Decision Lists" *University of California, Berkeley, Technical Report*, to appear.

(7) A. Cachia, J.-F. Mangin, D. Riviére, D. Papadopoulos-Orfanos, F. Kherif, I. Bloch, and J. Régis, "A generic framework for parcellation of the cortical surface into gyri using geodesic voronoï diagrams," Image Anal., vol. 7, pp. 403–416, 2003.

(8) B. Fischl and A. M. Dale, "Measuring the thickness of the human cerebral cortex from magnetic resonance images," in PNAS, 2000, vol. 97, pp. 11050–11055.

(9) B. Fischl, M. I. Sereno, R. Tootell, and A. M. Dale, “High-resolution intersubject averaging and a coordinate system for the cortical surface,” Hum. Brain Mapp, vol. 8, pp. 272–284, 1999.

(10) Buckley, C. and Salton, G. and Allan, J., "Automatic Retrieval with Locality Information Using SMART." Proceedings of the First TREC Conference, 1993.

(11) B. Cohen, A. E. Dolbey, G. K. Acquaah-Mensah, and L. Hunter, “Contrast And variability in gene names” *Proceedings of the ACL* Workshop on Natural Language Processing in the Biomedical Domain, Philadelphia, PA, July 2002.

(12) C. Brechbuhler, G. Gerig, and O. Kubler, “Parametrization of closed surfaces for 3-D shape description,” Computer Vision Image Understanding, vol. 61, pp. 154–170, 1995.

(13) C. Davatzikos, A. Genc, D. Xu, and S. M. Resnick, “Voxel-based morphometry using the ravens maps: Methods and validation using simulated longitudinal atrophy,” NeuroImage, vol. 14, pp. 1361–1369, 2001.

(14) C. Blasche et al. “Automatic extraction of biological information from scientific text: protein-preotein interactions” *ISMB 1999*. **7**: 60-67.

(15) Chen J, Lai G, Hsueh S. Malignant Thyroid Teratoma of an Adult: A Long Term Survival after Chemotherapy. Am J Clin Oncol 1998; 21(2): 212-214.

(16) Comiter C, Kibel A, Richie J, Nucci M, Renshaw A. Prognostic featues of Teratomas with Malignant Transformation: A Clinicopathological study of 21 cases. J Urol 1998; 159: 859-863.

(17) D. L. Collins, P. Neelin, T. M. Peters, and A. C. Evans, “Automatic 3-D intersubject registration of mr volumetric data in standardized talairach space,” J. Comput. Assisted Tomogr, vol. 18, pp. 192–205, 1994.

(18) C. Davatzikos and R. N. Bryan, “Using a deformable surface model to obtain a shape representation of the cortex,” in Proc. IEEE Int. Conf. Computer Vision, 1995, vol. 9, pp. 2122–2127.

(19) D. A. Pizzagalli, T. R. Oakes, A. S. Fox, M. K. Chung, C. L. Larson, H. C. Abercrombie, S. M. Schaefer, R. M. Benca, and R.
J. Davidson, "Functional but not structural subgenual prefrontal cortex abnormalities in melancholia," Molecular Psychiatry, vol. 9, pp. 393–405, 2004.

(20) D. O. Siegmund and K. J.Worsley, "Testing for a signal with unknown location and scale in a stationary gaussian random field," Ann. Stat., vol. 23, pp. 608–639, 1996.CHUNG et al.: WEIGHTED FOURIER SERIES REPRESENTATION AND ITS APPLICATION 581.

(21) D. Palmer, and M. Hearst, "Adaptive Multilingual Sentence Boundary Disambiguation" *Computational Linguistics*, 23 (2), 241-267, June 1997.

(22) D. Yarowsky, "Decision Lists for Lexical Ambiguity Resolution: Application to Accent Restoration in Spanish and French" *Proceedings of the ACL, 1994*: 88-95.

(23) Winter T, and Freeny P. Hepatic Teratoma in an Adult; Case Report with a Reviw of the Literature. J Clin Gastroenterol 1993; 17(4): 308-310.

(24) E. Adar, "S-RAD: A Simple and Robust Abbreviation Dictionary" *HP Laboratories Technical Report*, September 2002.

(25) Fagan, J., Experiments in Automatic Phrase Indexing for Document Retrieval: A Comparison of Syntactic and Nonsyntactic Methods, Doctoral Dissertation, Cornell University, Report TR 87-868, Department of Computer Science, Ithaca, NY, 1987.

(26) Fuhr, N., "Models for Retrieval with Probabilistic Indexing." Information Processing and Management 25(1), 1989, pp. 55-72.

(27) Fuhr, N. and Buckley, C., "A Probabilistic Learning Approach for Document Indexing." ACM Transactions on Information Systems 9(3), 1991, pages 223-248. 352
(28) Fuhr, N. and Buckley, C., "Optimizing Document Indexing and Search Term Weighting Based on Probabilistic Models" Proceedings of the First TREC Conference,**"1993.**

(29) F. L. Bookstein, “Voxel-based morphometry should not be used with imperfectly registered images,” NeuroImage, vol. 14, pp. 1454–1462, 2001.

(30) G. Gerig, M. Styner, and G. Szekely, “Statistical shape models for segmentation and structural analysis,” in Proc. IEEE Int. Symp. Biomed. Imag. (ISBI), Apr. 2002, pp. 18–21.

(31) C. D. Good, I. S. Johnsrude, J. Ashburner, R. N. A. Henson, K. J. Friston, and R. S. J. Frackowiak, “A voxel-based morphometric study of ageing in 465 normal adult human brains,” NeuroImage, vol. 14, pp. 21–36, 2001.

(32) G. Wahba, Spline Models for Observational Data. Philadelphia, PA: SIAM, 1990.

(33) H. Yu, G. Hripcsak, and C. Friedman, “Mapping abbreviations to full Forms in biomedical articles” *J Am Med Inform Assoc 2002*; 9(3): 262-272.
(34) H. Groemer, Geometric Applications of Fourier series and SphericalHarmonics. Cambridge, U.K.: Cambridge Univ. Press, 1996.

(35) H.-G. Muller, “Functional modeling and classification of longitudinal data,” Scand. J. Stat., vol. 32, pp. 223–240, 2005.

(36)Imai T. Ein Fall von zystischem teratom der leber, in welchem Platten epithelkrebs entstand. Trans Soc Pathol Jap 1934; 24: 578.

(37) J. Ashburner and K. Friston, “Voxel-based morphometry—the methods,” NeuroImage, vol. 11, pp. 805–821, 2000.

(38) J. Fan and I. Gijbels, Local Polynomial Modelling and Its Applications.Boca Raton, FL: Chapman & Hall/CRC, 1996.

(39) J. H. Friedman, J. L. Bentley, and R. A. Finkel, “An algorithm for finding best matches in logarithmic expected time,” ACM Trans. Math. Software, vol. 3, pp. 209–226, 1997.

(40) J. D. MacDonald, N. Kabani, D. Avis, and A. C. Evans, “Automated 3-d extraction of inner and outer surfaces of cerebral cortex from mri,” NeuroImage, vol. 12, pp. 340–356, 2000.

(41) J. G. Sled, A. P. Zijdenbos, and A. C. Evans, "A nonparametric method for automatic correction of intensity nonuniformity in mri data.

(42) J.T. Chang, H Schütze, and R.B. Altman, "Creating an Online Dictionary of Abbreviations from MEDLINE" *JAMIA*, to appear.

(43) J. Pustejovsky, J. Castaño, B. Cochran, M. Kotecki, M. Morrell, and A. Rumshisky, "Extraction and Disambiguation of Acronym-Meaning Pairs in Medline" unpublished manuscript, 2001.

(44) J. Pustejovsky et al. "Automation Extraction of Acronym-Meaning Pairs from Medline Databases" *Medinfo* 2001; 10 (Pt 1): 371-375.

(45) J. O. Ramsay and B. W. Silverman, Functional Data Analysis. New York: Springer, 1997.

(46) K. M. Dalton, B. M. Nacewicz, T. Johnstone, H. S. Schaefer, M. A.Gernsbacher, H. H. Goldsmith, A. L. Alexander, and R. J. Davidson, "Gaze fixation and the neural circuitry of face processing in autism," Nature Neuroscience, vol. 8, pp. 519–526, 2005.

(47) K. J. Friston, A short history of statistical parametric mapping in functional neuroimaging Wellcome Dept. Imag. Neuroscience, ION, UCL, London, U.K., Tech. Rep., 2002.

(48) K. Kollakian, "Performance analysis of automatic techniques for tissue classification in magnetic resonance images of the human brain," M.S. thesis, Concordia Univ., Montreal, QC, Canada, 1996.

(49) K. J. Worsley, "Local maxima and the expected euler characteristic of excursion sets of _2, f and t fields," Adv. Appl. Probab., vol. 26, pp. 13–42, 1994.

(50) K. J. Worsley, S. Marrett, P. Neelin, A. C. Vandal, K. J. Friston, and A. C. Evans, "A unified statistical approach for determining significant signals in images of cerebral activation," Human Brain Mapp., vol. 4,pp. 58–73, 1996.

(51) K. J. Worsley, J. E. Taylor, F. Tomaiuolo, and J. Lerch, "Unified univariate and multivariate random field theory," NeuroImage, vol. 23, pp. 189–195, 2005.

(52) K.Taghva, and J. Gilbreth, "Recognizing Acronyms and their Definitions" *IJDAR 1* (4), 191-198, 1999.

(53) L.Shen and M. K. Chung, "Large-scale modeling of parametric surfaces using spherical harmonics," in 3rd Int. Symp. 3-D Data Processing, Visualization Transmission (3DPVT), Chapel Hill, NC, Jun. 14–16, 2006.

(54) L. Shen, J. Ford, F. Makedon, and A. Saykin, "Surface-based approach for classification of 3-D neuroanatomical structures," Intell. Data Anal., vol. 8, pp. 519–542, 2004.

(55)L. A. Adamic, D. Wilkinson, B. A. Huberman, and E. Adar, "A Literature Based Method for Identifying Gene-Disease onnections" *Proceedings of The 2002 IEEE Computer Society Bioinformatics Conference*, Stanford, CA, August 2002.

(56) L.S. Larkey, P. Ogilvie, M.A. Price, and B. Tamilio, "Acrophile: an Automated acronym extractor and server" *Proceedings of the ACM Fifth International Conference on Digital Libraries*, DL '00, Dallas TX, May 2000.

(57)M. K. Chung, "Heat kernel smoothing on unit sphere," in Proc. IEEE Int. Symp. Biomed. Imag. (ISBI), Apr. 2006, pp. 992–995.

(58) M. K. Chung, K. M. Dalton, A. L. Alexander, and R. J. Davidson, "Less white matter concentration in autism: 2-D voxel-based morphometry," NeuroImage, vol. 23, pp. 242–251, 2004.

(59) M. K. Chung, S. Robbins, R. J. Davidson, A. L. Alexander, K. M. Dalton, and A. C. Evans, "Cortical thickness analysis in autism with heat kernel smoothing," NeuroImage, vol. 25, pp. 1256–1265, 2005.

(60) M. K. Chung, K. J.Worsley, S. Robbins, T. Paus, J. N. Taylor, J. Giedd, J. L. Rapoport, and A. C. Evans, "Deformation-based surface

morphometry applied to gray matter deformation," NeuroImage, vol. 18, pp. 198–213, 2003.

(61) M. I. Miller, A. Banerjee, G. E. Christensen, S. C. Joshi, N. Khaneja, U. Grenander, and L. Matejic, "Statistical methods in computational anatomy," Stat. Methods Med. Res., vol. 6, pp. 267–299, 1997.

(62) M. I. Miller, A. B. Massie, J. T. Ratnanather, K. N. Botteron, and J. G. Csernansky, "Bayesian construction of geometrically based cortical thickness metrics," NeuroImage, vol. 12, pp. 676–687, 2000.

(63) M. Quicken, C. Brechbuhler, J. Hug, H. Blattmann, and G. Szekely, "Parameterization of closed surfaces for parametric surface description," in IEEE Computer Soc. Conf. Computer Vision Pattern Recognit.(CVPR), 2000, pp. 354–360.

(64) M. Craven, and J Kumlien, "Constructing Biological knowledge Bases by Extracting information from Text Sources" *Proceedings of the 7th International Conference on Intelligent Systems for Molecular Biology*, 77-86, Heidelberg, Germany. AAAI Press.

(65) M. Palakal, M. Stephens, S. Mukhopadhyay, R. Raje, and S. Rhodes, "A Multi-level Text Mining Method to Extract Biological Relationships" *Proceedings of the 2002 IEEE Computer Society Bioinformatics Conference*, Stanford, CA, August 2002.

(66)Misugi K, Reiner CB. A malignant true teratoma of the liver in childhood. Arch Pathol 1965; 80:409-12.

(67) Nies C, Zielke A, Hasse C, Ruschoff J, Rothmund M. Carcinoid tumors of Meckel's diverticula: report of two cases and review of the literature. *Diseases of the Colon and Rectum*. 35(6):589-96, 1992 June.

(68) P. M. Thompson, K. M. Hayashi, G. de Zubicaray, A. L. Janke, S. E.Rose, J. Semple, D. Herman, M. S. Hong, S. S. Dittmer, D. M. Doddrell, and A. W. Toga, "Dynamics of gray matter loss in Alzheimer's disease," J. Neurosci., vol. 23, pp. 994–1005, 2003.

(69) P. M. Thompson and A. W. Toga, “A surface-based technique for warping 3-dimensional images of the brain,” IEEE Trans. Med. Imag., vol. 15, no. 4, pp. 402–417, Aug. 1996.

(70) R. Courant and D. Hilbert, Methods of Mathematical Physics. New York: Interscience, 1953, vol. 1.

(71) S. C. Johnson, L. C. Baxter, L. Susskind-Wilder, D. J. Connor, M. N. Sabbagh, and R. J. Caselli, “Hippocampal adaptation to face repetition in healthy elderly and mild cognitive impairment,” Neuropsychologia, vol. 42, pp. 980–989, 2004.

(72) S. C. Joshi, J. Wang, M. I. Miller, D. C. Van Essen, and U. Grenander, “On the differential geometry of the cortical surface,” Vision Geometry IV, pp. 304–311, 1995.

(73) S. V. Pakhomov, “Semi-supervised Maximum Entropy-based Approach to Acronym and Abbreviation Normalization in Medical Texts” *Proceedings of ACL 2002*, Philadelphia, PA, July 2002.

(74) S. Yeates, D. Bainbridge, and I. H. Witten, “Using compression to identify Acronyms in text” *in Data Compression Conference*, 2000.

(75) T. Paus, A. Zijdenbos, K. J. Worsley, D. L. Collins, J. Blumenthal, J. N. Giedd, J. L. Rapoport, and A. C. Evans, “Structural maturation of neural pathways in children and adolescents: In vivo study,” Science, vol. 283, pp. 1908–1911, 1999.

(76) S. M. Robbins, “Anatomical standardization of the human brain in Euclidean 3-space and on the cortical 2-manifold,” Ph.D. thesis, School Computer Sci., McGill Univ., Montreal, QC, Canada, 2003.

(77) Salton, G. and Buckley, C., "Term Weighting Approaches in Automatic Text Retrieval." Information Processing and Management 24(5), 1988, pages 513-523.

(78) Salton, G. and Yang, C.S., "On the Specification of Term Values in Automatic Indexing." Journal of Documentation 29(4), 1973.

(79) T.C. Rindflesch et al. “Extracting Molecular Binding Relationships from Biomedical Text” *Proceeding of the ANLP-NAACL 2000*, pages 188-1995.

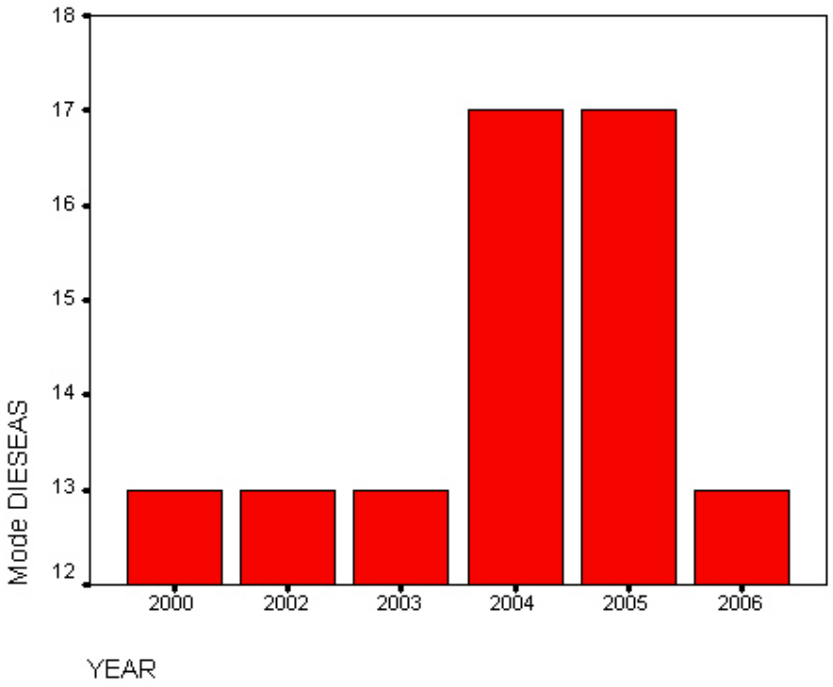
(80)Winter T, and Freeny P. Hepatic Teratoma in an Adult; Case Report with a Reviw of the Literature. J Clin Gastroenterol 1993; 17(4): 308-310.
(81)Wakely PE, Krummel TM, Johnson DE. Yolk sac tumor of the liver. Mod Pathol 1991ss; 4: 121-125.

(82) X. GU, Y. L. Wang, T. F. Chan, T. M. Thompson, and S. T. Yau, “Genus zero surface conformal mapping and its application to brain surface mapping,” IEEE Trans. Med. Imag., vol. 23, no.8, pp. 1–10, Aug. 2004.

(83) Zafran ES, Gauland P. Primary Lymphoma of the Liver. Liver 13:57-61, 1993. 3 Scoazec J-Y, Degott C, Brouss N, et al. Non-Hodgkin'.

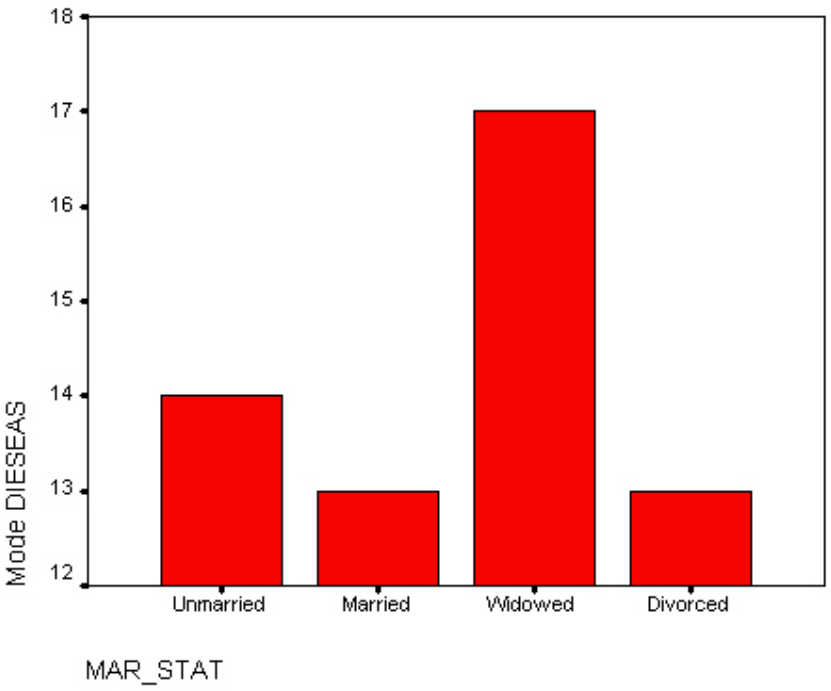
# APPENDIX

# Appendix A



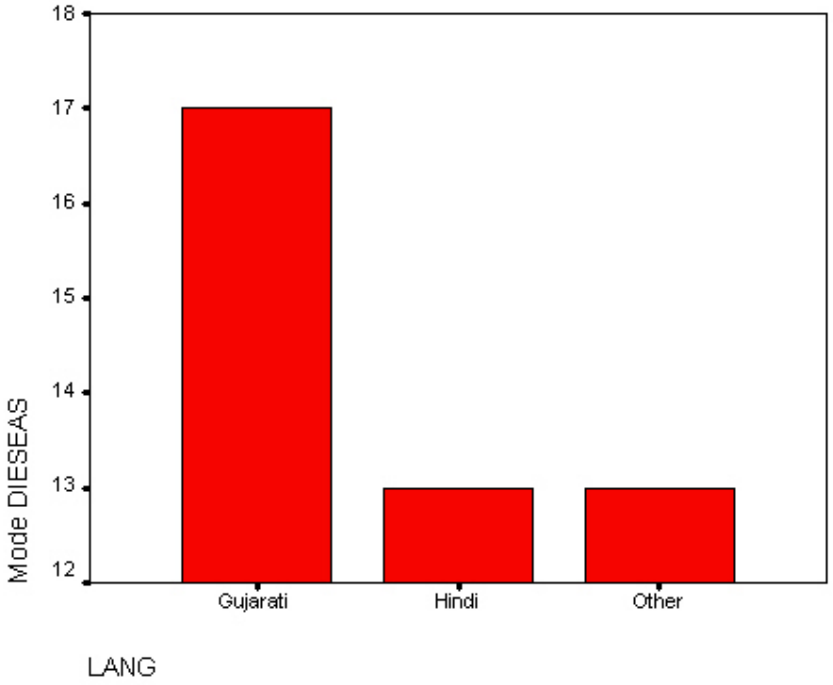

In this histrograph put years in X-axis and mode of diseas in Y-axis. We observed that disease no 13 (Brest cancer) are more in the years 2000, 2002, 2003 and 2006 and disease no 17(Cervix cancer) are more in the years 2004 & 2005.

# Appendix B



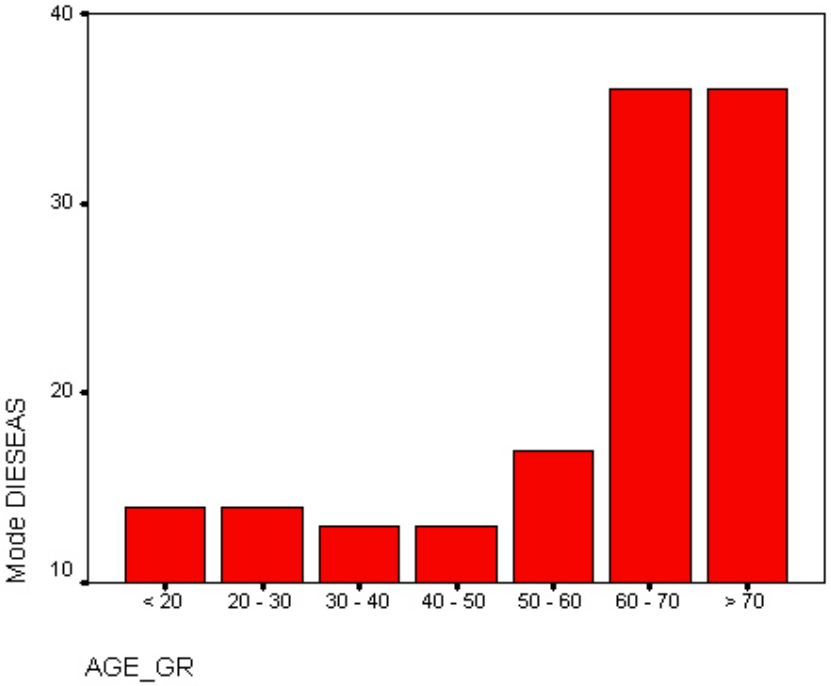

In this histrograph put Martial-Status in X-axis and mode of disease in Y-axis. We observed that disease no 14 (Brain cancer) are more in unmarried persons where as disease no 13 (Brest cancer) are more in married & divorced persons and disease no 17(Cervix cancer) are more in widowed persons.

## Appendix C



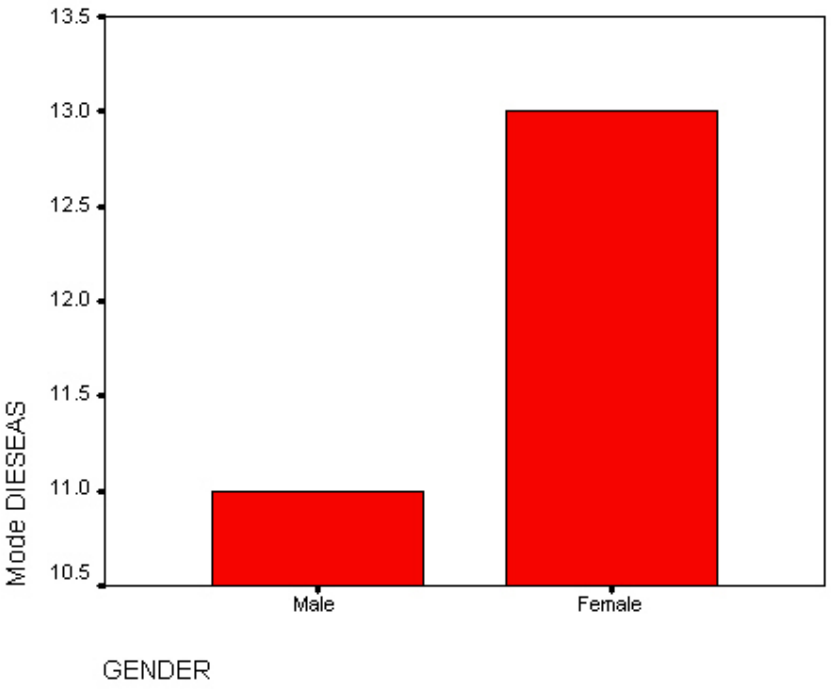

In this histograph put Mother-tounge (Language) in X-axis and Mode of diseases in Y-axis. We observed that disease no 17 (Cervix cancer) are more in those persons who know Gujarati language and disease no 13(Brest cancer) are more in Hindi and other language.

# Appendix D



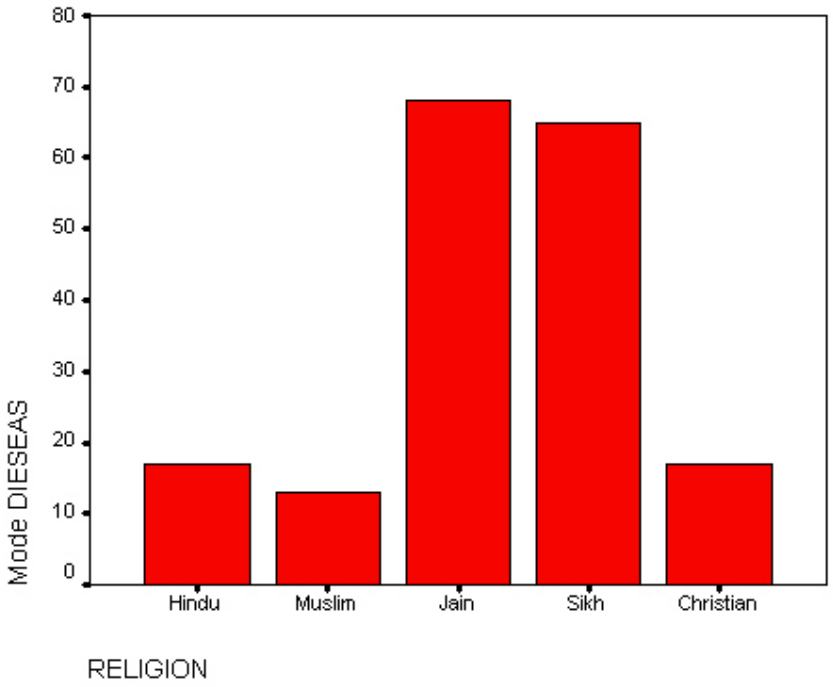

In this histograph put age-groups in X-axis and mode of disease in Y-axis. We observe that disease no 14(Brain cancer) are more in age-group below 20 & 20-30 where as diseases no 13(Brest cancer) are more in age-group 20-30 & 30-40, diseases no 17 (Cervix cancer) are more in age-group 50-60 and diseases no 36 (Lung cancer) are more in age-group 60-70 and above 70.

# Appendix E




In this histograph put males and females in X-axis and mode of disease in Y-axis. Above graph we observe that disease no 11(Tongue cancer) are more in males and disease no 13(Brest cancer are more in Females.

# Appendix F




In this histogrph put religions in X-axis and mode of diseases in Y-axis. Above graph we observed that disease no 17(Cervix cancer) are more in Hindu and Christian persons where as disease no 10 (Abdoeminal L.N.) are more in Muslim persons, disease no 65 (Secondary Skin Cancer) are more in Sikh persons and disease no 68 (Tongue cancer) are more in Jain persons.

# Appendix G

Type of Cancer (Site)

| Sir No | |
|---|---|
| 1 | Anal Canal |
| 2 | Acute Lymphoblastic Leukaemia |
| 3 | Actue Leukaemia |
| 4 | Actue myeloid Leukaemia |
| 5 | Actue Promyelocytic Leukaema |
| 6 | Adremalgland |
| 7 | Abdomen |
| 8 | Ampulla |
| 9 | Axllary L.N. |
| 10 | Abdoeminal L.N. |
| 11 | Base of Tongue |
| 12 | Bone |
| 13 | Breast |
| 14 | Brain |
| 15 | Buccal Mucosa |
| 16 | Bladder |
| 17 | Cervix |
| 18 | Chronic |
| 19 | Colon |
| 20 | Connestive Tissue |
| 21 | Corpus Uteri |
| 22 | Chronic myeloid leukaemia |
| 23 | Esophagus |
| 24 | Eye and Adnexa |
| 25 | Floor of Mouth |
| 26 | Gum |
| 27 | Gall Bladder |
| 28 | Hypopharnx |
| 29 | Hodgkin`s Disease |
| 30 | Inguinal L.N. |
| 31 | Hodgkin`s lymphoma mixed cellularity |
| 32 | Kidney |

33 Larynx
34 Liver
35 Lip
36 Lung
37 Lymphnodes Neck
38 Multiple Myeloma
39 Mediastinum
40 Maxillany sinus
41 Non Hodgkin`s Lymphoma
42 Nasal Cavity
43 Nasopharynx
44 Ovary
45 Orpharynx
46 Penis
47 Pharynx
48 Pyriform Fossa
49 Prostate
50 Pleura
51 Plate
52 Parotid aland
53 Pancreas
54 Rectum
55 Retroperitoneum
56 Rectosigmoid
57 Skin
58 Secondary Adrenal Gland
59 Stomach
60 Secondary Liver
61 Secondary Bone
62 Secondary BRAIN
63 Secondary Rectroperitoneum
34 Salivary Gland
65 Secondary Skin
66 Secondary Lung
67 Testis

68 Tongue
69 Tonsil
70 Thyroid
71 Upper limb
72 Vagina
73 Vulva
74 Plasmacytoma
75 Thoraxnos
76 Intestimal tract

| | Sex | Marital Status | Mother Toungs | Religion | Site |
|---|---|---|---|---|---|
| | | 1 | | | |
| 1 | Male | Unmarried | 1 Gujarati | 1 Hindu | 1 to 76 |
| 2 | Female | 2 Married | 2 Hindi | 2 Muslim | |
| | | 3 Widow | 3 Unknow | 3 Jain | |
| | | 4 | | | |
| | | Divorced | | 4 Sikh | |
| | | | | 5 Christian | |