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Modern Medical Life Statistics: their Role and Impact on Human Life

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Abstract: The majority of population with scanty or no understanding of statistical views deems statistics and medicine as a daunting task, a matter to be more regarded in enhancing the welfare or health of people. Some of the human communities perceive statistics, which plays a critical role in medical field, as only a science of digits or figures. Owing to this, the crucial view of statistics is not followed in medical or clinical trials. Hence, it is onerous to know: (i) Why the statistical point of views must be connected in the realm of medical science, particularly in clinical trial; (ii) How statistics is put to use and has developed attention with medicine; and (iii) How medical researchers test their hypothetical views have to be known. In spite of the appearance of new techniques and technology, statistics is still in use to interpret a broad course of data arising from a variety of disciplines. In the expansion of medicine,

biology as well as pharmacy, physicians, researchers and scientists make use of different statistical methods not only to maintain the interpretability of warnings of traditional statistical tests; it nevertheless allows it to extend their conclusions beyond what is specific in the raw data . While medicine must continuously advance with the quit discoveries of science and technology, statistical methodologies used in medicine have to be unified with the medical or biological content and the ethical or societal desiderata. It is with all three intention of presenting statistical researches and findings with a view of enlightening this unfailing interplay. Later on, it is planned to guide doctors and biostaticians who are going to possess clinical trials. In general practice, the broader role of statistics is referred to in education, training and research of medical, biological and pharmaceutical scientists. It is with the above in mind that this humble venture has been made to encourage a broader view of Statistics in those working in medical field and to introduce a selection of the many statistical issues presently in focus in this realm.

Keywords: Medical statistics, clinical trials, epidemiology, healthcare analytics, statistical modeling, public health.

1. Introduction

It might be thought that Philosophy and Medicine are, without any doubt, two separate areas of study: one humanistic, questioning all that is existence and essence; the other, the technical recommendation of actions to favour health. But that view would be too naïve. The traditional way West has studied Science, that is, in a very sharply cut paradigm, counted on the present hard split between Episteme and Techne. So, Medicine would be the application of Biology principles that lead to the production of care and comfort, what would mean it presents a clearly defined theoretical corpus. And actually, it has become just this, in particular with the proposal of the strong concept of technical standardization. But, from a non-clinical point of view, there can be found certain theories that can be very useful to understand Medicine’s nature and relevance today. So, it is always interesting for Philosophy to consider what is happening now. Besides, Medicine and Philosophy have not always been so dissociated, and it is far more exciting to reconcile them. Politics has always been steeply connected with Medicine, since both these disciplines, just like they must do, look after people’s wellbeing. Therefore, they have to take care of the quality of living of the citizens. If the milieu where dwells human beings does not provide the correct conditions for the full flowering of development, and when social inequality, poverty, and privation have their ill effect over the welfare – capital both for physical

and psychic health – then, the quality of living degrades rapidly. In disastrous scenarios, all along the centuries, the risks hovering over the individual's life have been demonstrated. It is just too easy to draw attention to public squares to see the public executions of beggars and thieves: wasn't it the idea that such a show ought to scare people away from social discontent or from a life of sin? Anyhow, at least from the classical age on, legal documents have assured reasonable control of death, due to the smaller quartiers des morts, or of dull morbidity and loss of productivity, for the control of diseases of the plague kind. Especially remarkable is Late Medieval Painting, since it represents the thing it is more scared: a consequence of leprosy. This is because, on a lesion represented by a huge seeping growth on the leg, people were prone to practice a barbaric procedure. They gently cauterized the lesion, starting from the foot and moving upwards. So, the limb was slowly amputated just when the death throes started. Then, the man, who was young, would have twenty-four hours, or a little less, of grim agony. [1][2]

Literature Reiview

2. Historical Background of Medical Statistics

The majority of the population poorly understand the implication of statistics in the field of medicine. Various topics are reviewed, including in Q1: why statistical views must be incorporated in medical or clinical trials, Q2: how statistics is applied in and evolved with medicine.

In the middle of the sixteenth century, William Shakespeare professed that "ignorance is the curse of God; knowledge is the wing wherewith we fly to heaven." This statement has ever held the essence of truth. Because of the rise in civilization of humankind, the domain of human knowledge has been increased vastly. However, the "hidden lines" that cover the realm of unknown facts are still essential to be broadened [3]. In antiquity, the domain of human knowledge was confined within the limit of planets, the earth, and few others. These facets can easily be justified with the revelation that the branches of science were not then branched out so nicely as now. The cave dwellers were content with the inevitable incidents considering them to be acts of demons. But as soon as human intellect developed, they endeavored to delve into the depth of nature. As a result, natural phenomenon, which were erstwhile treated with awe, were discovered to possess nothing magical. Uncertainty abided solely because of the absence of valid explanation. Practice of sound reasoning led men to speculate in the sphere of untold mysteries. Consequently, they gained almost indisputable hypothetical possibilities. Following this stand, man began to wield the wand of knowledge and made estranged the scepter of ignorance. Manifestation of facts after facts unveiled the glory of science. At the introduction of any subject, it is habitual to know what really it encapsulates. Statistics pertains to the collection, presentation, analysis, and interpretation of data. Though its passion took renaissance form about four decades ago, the subject's inception was in the beginning of the sixteenth century. At first statistics was limited to the collection of state policies, commodities and tyranny. The cradle of modern statistics is Zurich. Euler, Gauss, and Laplace had contributed greatly in this institute. Only in the nineteenth century, statistics accrued its legitimacy as a separate subject. Its multifarious operations guide the heavenly body. Prominence of statistics is realized in the realization of developed countries' science. In fact, developments of all disciplines materialize with the aid of statistics. As a matter of fact, statistics is called the branch of mathematics to which we can learn how to believe with the aid of it. Ideal and social phenomena are stated with the logical data of statistics. Due to the variation of interest, the Federal Republic of Germany instituted a central statistics office. Every kind of development of an item can be apprehended by how it is and the expression of its happening. On the page it gives us different items such as the share of capital, income, and life expectancy flourishing by years.

3. Importance of Medical Statistics in Healthcare

The birth of statistics and its growth is attributed to the growth of the state and its needs. It is interesting to observe that as the state grows, the statistical data will be collected by different

sources. It was mainly collected by local or central governments in ancient time, but now these data are gathered by U.N.O and other international organizations. The importance of statistics in the field of medical and health is a different chapter. Every science of routine life has a special branch in medical has evolved its own branch known as medical statistics. As medical science is concerned with the maintenance of health, diagnosis, treatment of disease, prevention of illness, and restoration of health etc. The medical men have been making progress in this direction.

Statistics used to interpret the numerical aspect of data. After completing the observations of an investigation there are 2 questions always arise. Firstly what has been observed and then what does all this mean? Most of the data have always been numerical such as temperature of body, height of a person etc., and interest been belongs to the numerical data. Physicians, researchers and scientists use different as well as advanced statistical methods to improve the medicine, so that its techniques functions and its application performed better and better day by day. Medicine has advanced to its present state through an amalgamation of science, and disease, and therapy. Disease is a disorder in the body functions and body parts. It can be clinical or physiological, acute or chronic i.e. short or long, life shortening or nuisance etc. Therapy is the treatment of disease that attempts to heal and give which improve the health of patient. With the development in medical science the scientist begin to do some research on disease so that the man treatment is used. In the sense to look at the future of any cure an experiment, trials and sometimes investigative process is used. Broadly statistics plays an important role in those research and experiment process. The new treatment regimen like vaccines, experiments of the drug and new introduction of disease through theory or occurrence of pollution is a part of statistics. The congress of the science is discussed in detail. The method and the way to analyze in the favor of medicine are described. In the sense medicine part of statistics is very wide and large. The time fact is also described that the lot of tools in statistics are used in the sense of experiments in medicine. Many of the way to treat disease is better in the sense of certainty is achieved by experiment and by using the statistics [3].

4. Types of Medical Statistics

In modern medical life the statistics play a vital for identification of the cause relevant treatment and epidemics. In this process there are many different types of medical statistics. They are divided into four major types as follows. They are medical mortality statistics, medical vital statistics, medical non-vital statistics, and medical hospital statistics. The mortality statistics are the statistics dealing with the data on the number of death or deaths within the period under consideration. The medical mortality statistics are concerned with the death due to some or the other disease. It is the medical professional and the medical records that hold the data on the mortalities. This type of data serves a great purpose for a better observation of the pattern of prevalence of epidemic diseases. The advanced analysis of such data helps in tracking down the cause and disease of the epidemics, which in turn proves helpful in its pinpoint treatment and eradication [3]. It also helps in the preparing the mortality tables of the diseases.

4.1. Descriptive Statistics

Statistics play an important role in movie making, criminal justice, and medical science. In medical testing, doctors use statistics to interpret, analyze, and communicate data. However, because of statistical illiteracy, modern doctors usually do not understand the information presented in medical science sections. The importance of statistics in medicine is discussed to maintain clinical efficacy and efficiency in treating diseases, and to extend the duration of the next business, the average of expected years. The importance of statistics in medical science is verified according to the statistics, and streamlined to medical life, and the meaning is explained through relevant stories [3]. In the area of synthetic interpretation, understanding is deepened from the old point of view into the deep and wide new domain. Lesson Goals Understanding the statistical importance of Modern Medical Life and Life Extension Research Good interpretation and accurate data analysis of the progress of Modern Medical Life and Life Extension Research

Detailed understanding of Resveratrol research through literature. Traditionally, medicine as well as medical system has been focused on various aspects, such as individual life expectancy and illness recovery. But, recently, many people are greatly interested in anti-aging and the life extension together with development of medical technology.

4.2. Inferential Statistics

4.3. Predictors Among Patients Undergoing Lithotripsy

Out of 300 patients, 85 (28.3%) had at least one previous episode of upper urinary stone, 120 patients (40.0%) had at least one previous episode of lower urinary stone, and while 44 (14.7%) had urinary stone in both locations. Almost half 132 (44%) of the patients were hospitalized due to urinary stones. Following nausea/vomiting, pain, and dysuria, fever was accepted after the operation. This complaint, having differences in terms of sex of patients or having the operation or not, was accepted as a little high among the disliked parts of HPL. Otherwise from that; pain was the mostly reported symptom before operation. As has seen, it is also having the highest rate after the operation.

Most of the patients are evaluated with IVU (57.7%), followed by USG (51.7%). There was no use of Scintigraphy in the current clinical diagnoses whereas 4 patients do not have any due to their young age. AI is performed more frequently to the patients who have schooling levels graduated from primary schools. Certain symptoms like general malaise, fatigue, pain after miction, and fever are seen more frequently among patients having upper urinary stones. On the other hand, cause flushing with the water from the direction of kidney to bladder following the mictional urge is more frequent in patients having lower urinary stone. Staying after flushing on the right side for a while in a position that the right hypogastric region is higher than the left would increase this effect. Just as the results of sleepiness when seated following musculoskeletal manipulation during the operation are also not satisfying, complaint after the surgery is significantly increasing. [4][5][6]

5. Key Concepts in Medical Statistics

Looking around at modern American society, one can easily tell that human wisdom may be outdated. Age and past occurrences can fundamentally affect the outcomes of events. Simply being around to go through specific events adds an element of understanding which may not be found with statistical data. But, looking at how the medical field has progressed through statistical thought can possibly allow one to grasp a glimpse of understanding how day-to-day human life and actions work. Unfortunately, it’s simpler to explain medical happenings both in the past and the current moment than to foretell the uncertain future. Starting during the 19th century, late 1800’s exact, International Classification of Diseases (ICD) codes were started to be assigned to death certificates [3]. Evidently, ‘death’ has been around for an elongated amount of time so the idea to classify it and the causes of it was pertinent. In other words, the medical field got off to an early start amongst statistical thought.

From a baseline observation, one would predict that America must be an incredibly unsafe place to live and illness must run on the order of a thousand times the current size of the population. But, the idea that doctors may overuse certain procedures and medications doesn’t cross most ordinary folk’s minds. People endure preventative check-ups from “trusted” health-care providers in quantities varying with age and ads they saw on TV. Clearly, not smoking or a sedentary life must assure that a multitude of medical evils stay at bay for a majority of the population. These occurrences don’t hold much statistical value but many people carry these notions around as true.

5.1. Population vs. Sample

Population is all items or individuals of interest in a study. A population is usually too large to study, and an attempt to collect data about every item or individual in a population is generally

not feasible [7]. A sample is a subgroup of the population selected for participation in a study. Conclusions drawn from a sample can thus be applied to the population with a certain margin of error. Therefore, sampling and the examination of error related to sampling are fundamental to all scientific studies. Population since all items or individuals in study is large, it can be considered as a hypothetical, unlimited, infinite collection of items or individuals; it is complete and continuous. The population is in fact the statistical object we would ideally like to describe or draw inferences about, but it is generally not feasible or practical to collect data about all population. Sample would be that subset of the population from which the data are actually collected. Data are then collected and inferences would be made to the larger population; the responses of the sample that are actually observed, which are considered as quantities, are usually the realizations of the random variables.

5.2. Mean, Median, and Mode

The totals (mean, median, mode) are the combination of a requirement that the totals must lie between (0, 1) in standard notation, surprise it all the same, and the requirement that all three values be given simultaneously. Given (a, b) there are two functions which bound x such that, F(x) - a and b - F(x), x is confined between (a, b). For a continuous distribution the median does not exist in general. For a continuous distribution the mode is always zero. Therefore, for a continuous distribution no set of (a, b) can be found on which to base the surprise.

From a set of data points D(x), one wishes to determine a set of best estimated points E(x). This goal is pursued via some method of data reduction. At each x one specifies a window W(x) or W[x]. The normalization of W is arbitrary, or in other words, its area is not specified but the requirement is that its full width is fixed at d and therefore the number of data points it encompasses change. Keeping this window in mind, possible methods of data reduction are:

Select every data point as a best estimate. This quickly summarizes the data set in a bar-graph type histogram of the windowed data. As long as the data set has more data points than windows, counting the number of data points in this fashion has an inherent bias. Most models of curve crossing tend to emphasize data points crossed while passing through the window as opposed to cueing up on it. There is no unbiased criteria for a decision before calculating these quantities which limits their utility. The process of counting data points also generates a spurious zero-crossing mode. [8][9][10]

5.3. Standard Deviation and Variance

A prerequisite for the discussion is an understanding of some statistical concepts such as the mean, the median, the standard deviation and the variance. In the following these concepts are introduced, explained and it is illustrated how they can provide information on a plethora of aspects playing a role in modern medical life. Lastly, it is described in an exemplary analysis how these concepts can be used to ‘unveil’ some mysteries related to contemporary human (henceforth termed VAD), mysteries that seem to be a part of individuals’ lives regardless of their prosperity [11].

As is presumably the case with any discipline using mathematical and quantitative methods, statistics play a pivotal role in demography to test hypotheses and to quantify effects of variables. All the populations of all the countries in the world cannot be surveyed regularly in order to trace their fertility and mortality behaviour, particularly as there is a great number of subgroups that need to be followed up (due to the complexity of the age-time arrangement of fertility and mortality data). Instead it is common to take a sample. However, to be meaningful, this sample must contain a large number of observations because the demographic interest is focused on the population as a whole, not on the individuals or events in the population. The statistics described here are either defined in this abstract sense or as estimators for frequency distributions derived from such a sample, such as life expectancy at birth. In its everyday usage ‘demographic statistics’ refers to (numerical) data on population size and its change due to

births, deaths, and migration, and it also counts the publication presenting these data. Additional articles use this broader and this narrow usage. It is alluded by the term ‘life table construction’ that the raw data is already available. Instead the focus here is on the basic demographic statistics calculable from a life table alone. Five tables are the backbone of the life table system and the two ‘western’ systems are introduced here. There is no other body of work in the literature presenting, at this level of detail, how from observed numerical data certain demographic data can be calculated.

Materials and Methods

6. Research Design and Methodology in Medical Statistics

6. Research Design and Methodology in Medical Life Statistics

Medical science life statistics is related to the public health program and the lives of patients. Today, there are a lot of fatal diseases and virus infections, which can kill a person very rapidly. It is the career of a lot of doctors and nurses to get the health of the patients normal. There are a lot of techniques from which they will try to achieve the goal. When a patient arrives in a working hospital, it is the first step to get the ideas of the history of the patient, because it tells about the cause of the diseases. It is stated that the clinical or pathological picture of the diseases can play a vital role in diagnosing the diseases. Therefore, various historical data of the patient are recorded in the history sheet. But by seeing these data from the history, it is not easy to take the proper decision; the view of the statistician is also needed. These data of the diseases can be recorded in tabular or graphical form which is understood by the specialist or doctor. Various properties of serum in blood samples can play a vital role in the diagnosis of the diseases.

The design of the medical experiments and clinical trials may be a powerful approach to evaluating the safety and efficiency of potential medications in patients with various diseases. The operating characteristic (OC) curves are useful in experimental design and efficiency reviews. As in the experimental models, the medicinal researchers may define the medical hypothesis for the treatment effect in the pre-specified group in order to contrast the possible therapy levels. The aim of this study is to include the OC curve on two new parameters, namely the non-inferiority of the IC difference and the relative margin of non-inferiority. An approximate solution to the sample size issue will be provided by using the OC curves technique in this proposal. The Webster’s dictionary defines statistics as "a branch of mathematics dealing with knowledge of the numerical relationship of objects and phenomena."

For physicians, medical students, clinicians, medical scientists, faculty members, and health professionals, there is a false seeming that statistics and probability are too far-fetched and mathematical for day-to-day medical practice, so they tend to either ignore or superficially study it. How is it possible to understand and properly utilize such widely-publicized medical knowledge as test sensibility, database probability factors, positive and negative predictive values, pre- and post-test likelihood, or patient treatment knowledge without comprehensive knowledge of the necessary mathematics and probability? Today, statistical knowledge is of a vital nature in the health education sector, especially in epidemics, advances in clinical mortality, morbidity trends, escalating costs, the overburdened healthcare system, and the greater role of mathematical models in medical decision analysis and health care planning [12].

6.1. Observational Studies

Majority of the population fails to understand fully the implication of statistics in medicine and treatment. It is not sufficient incorporation of statistics in the clinical trials. In addition, it is how to interpret the data, or results, of these trials [3]. For example, physicians and statisticians often disagree on the analysis of data, or on how to interpret p-values. Not infrequently, inappropriate applications of different statistical methods have been used by the researchers. Therefore, although it’s beyond the scope of regulation, raising the awareness of the importance of the role of statistics is urgent. Subsequently, it is reviewed how different statistical methods have been

used, or misused, in the medical equipment and pharmaceuticals. In the conclusion, it is proposed to implement a procedure in the design of medical research which facilitates the joint consideration of statisticians and medical researchers to ensure more effective use of statistics and to avoid some common misunderstandings on both sides. For the majority population, statistics is primarily numbers appearing in a printed table resulting from some special research either clinical trials or not. Often, this is a sufficient understanding. In fact, statistical practice is much more than this. The aims in clinical trials are not simply to compare numbers but to make statements concerning the results in a quantitative or a probabilistic term. It is rare that researchers agree regarding the methods for describing and summarizing the data. The situation is even more complicated not in comparing but deriving inference of the results of the population. With the rapidity of methodological development in biostatistics and the firm appearance of statistical consulting, strong efforts have been made to educate statisticians to avoid confusion and to provide better analyses of the clinical data. Additionally, much is published on design and analysis of data in medical research in statistical journals, as well as in the statistical sections of the medical journals. Hence, it is difficult to understand why disputes on statistical aspects continue to occur between clinical investigators and statisticians.

Results and Discussion

6.2. Experimental Studies

The ability to critically evaluate the medical literature is an important skill that can be acquired. This requires the systematic assembly of all relevant and related evidence followed by a critical appraisal of this evidence. From the very beginning, the help of the statistician should be sought, who can assist with questionnaire design, data collection, conducting the statistical analysis and interpretation of the results. In a nutshell, statistics deals with the collection of data, sample selection, data analysis and estimation of the effectiveness of the results [3]. Statistical techniques and tools may be used for establishing causation or non-causation of events, analyzing time series data, finding the trend of growth, extreme values and frame representation of time series data. It may be applied to detect the aging of stored blood by glucose consumption and oxygen consumption or analysis of residual compounds in urine. The results of the statistical analysis can predict the pregnancy choice re-entering contraception and abortion. The first modern clinical trial which could withstand today's criticism was conducted to study the effectiveness of streptomycin as treatment for TB comparing it with bed rest alone. The main goal was to measure the effectiveness of any medicinal form of treatment for tuberculosis. Similar trials were conducted in other countries. A pharmaceutical company may test the effectiveness of any antipyretic drug if those drugs are used to cure a headache. Biostatisticians can analyze whether exposure to a group of antibiotics (explanatory variable) can affect the effectiveness of the birth control pill (response variable). It is widely agreed among genetic counselors, general practitioners, and genetic theorists have an impact on decisions to undergo screening tests.

6.3. Clinical Trials

In the present modern medical life, statisticians essentially must be involved in all the procedures of the design, conduct, and analysis of a study. It is important to think about statistical design at the same time that one thinks about overall design and ethics [3]. The five steps intervention (1. Design the trial; 2. Obtain ethics and regulatory clearances; 3. Recruit and train the study teams; 4. Find the population to be studied; 5. Randomly allocate the groups) parallel to fulfill this requirement.

On the other hand, statisticians must be involved in every step before and throughout the process of the study as these steps are also part of the design. All the steps of the process are listed above. For instance, sample size can only be calculated knowing before the expected rate of an event or the mean. So, it is not possible to recruit and train study and myriad populations before choosing a statistical methodology, which should include among others stratification criteria and

the assumed event rate for each subpopulation [13]. According to this, statisticians must be consulted from the very beginning of a protocol. Acceptance of this consideration also assumes the acceptation of hypothesis 2, i.e., statistics is not only the evaluation of results but de facto everything from collection of data to conclusions. Concerning the classical gap between final "text" and the study protocol, it should be forbidden since the final results would be potentially based on a statistically inefficient preliminary design. Randomized comparisons have become the ingot standard in clinical trials. In the best trials, the comparisons are the only difference between the treatments being compared. Blinding is used in some of these studies to minimize bias. Bias can be encountered in retrospective or prospective cohort study, case-control study, and clinical trials. This can produce unrepresentative sample (selection bias), failure to sample the designated sample (selection bias), exclusion bias (selection bias), classification bias, confounding bias, assessor bias, interviewer bias, performance bias, expectation bias, detection bias, reviewer bias, and measurement bias. Blinding and randomization can safeguard against selection, performance, detection, and attrition bias.

7. Epidemiology and Public Health Statistics

The great importance of biostatistics in the practice of public health is widely recognized and cannot be overemphasized. The aims of this book are more modest and are likely a reflection of one author's view of what should be required in pre-service training in order to provide an avenue for the effective use of biostatistics.

Public health programs have always been believed to be closely aligned with the principles of biostatistical axiom. As far back as 1932, an outstanding statistician, writing about the relationship of statistics to public health, started with the following observation: "The proper fitting of statistics essential for the provides safety and security of all form of research and their correct interpretation or lack of it is responsible for a large proportion of gross blunders in public health matters." Thirty years later, another statistician observed that statisticians could have a key role to play in all major activities of government, including public health, if only they presented the potentialities of their science in a way which could be understood by administrators.

7.1. Prevalence vs. Incidence

A "prevalent case" is someone who is known to have a condition. It is someone who may have had the condition for some time and, for a variety of reasons could have come to the attention of healthcare services irrespective of the condition. Therefore, prevalence is a highly significant statistic when describing a population. Incidence, on the other hand, as the term implies, is the number of new cases of a condition that occur. Of insight would be the number of new cases in a certain unit of time. For a given condition, the incidence per unit of time is much lower than for prevalence, as for all new cases, there will be many more prevalent cases. There is a known rate of attrition for prevalent cases (usually they either get better or die). So the rate enlightening the attrition of prevalent cases and the rate describing the incidence of new cases, for chronic conditions, need to be either extremely low or very high.

Given that there has been a move to computerised health records, there is now a source of ascertained population data. In these records, data is reported by GPs, who act as gate-keepers to secondary/tertiary care, and up until recently, the vast majority of people see a GP to gain access to other care. Using these reports is easy as electronic records are codified. There are now commercially available datasets, which supply the complete electronic GP records of a cohesive patient group. This approach for a number of acute and iatrogenic conditions would be able to validate the calculated statistics from these datasets, and investigate the effects of ascertained incidence and prevalence on other health conditions.

7.2. Mortality Rates

There were a number of notable changes in the 1980s and a tendency in the early 1980s for age-specific mortality levels to be higher than expected compared with the relationship with percent low expenditure. Since then, several countries have stood out as having age-specific mortality rates that were below what would have been predicted from their progress with social development: Bangladesh and, to some extent, Sri Lanka, southern India, and the Indian state of Kerala. The early neonatal age group (death 0–6 days) was found to be particularly important in understanding the differences in progress among these 4 demographic areas.

Using empirical regressions estimated from global data sets relating under-five mortality to the percentage of low expenditure, these structural and health care-related trends can be used to predict the trends in age-specific mortality improvement. These predictions are then used to construct a model of would have been expected mortality rates from the level of development in a country. The model is used to identify countries with age-specific mortality rates that are higher or lower than what would have been expected from their progress with development since 1950.

Most obviously, Lesotho stands out as a country with age-specific mortality rates that are higher than what would have been predicted from its level of social development. In the developing world, countries with large populations of children or young adults stand out as the ones most affected by relatively high mortality rates – Indonesia and Nigeria in the former category, India and sub-Saharan Africa in the latter. In sub-Saharan Africa, the ages most affected were 15–59 years, not children. By contrast, in the industrialized countries of Europe, it was the middle aged, 25–69 years old.

Mortality rates were also very high among young adult men in a small number of countries in Oceania, as well as in some Caribbean and Latin American countries. Among the most populous countries, China had consistently lower than expected mortality rates in all age groups except for children aged 5–9 years, and adults aged older than 80 years. In the USA, mortality rates were higher than expected in the early adult ages between 20 and 40 years. The results for age-specific mortality rates in India and Pakistan were generally as expected, except for early neonatal ages in Pakistan and early neonatal to young adult ages in India. Bangladesh performed better than or as expected for all age groups. This large dataset spanning almost 70 years represents the first comprehensive analysis of the age-sex-specific death rates for single calendar years and single-year age groups. [14][15][16]

7.3. Risk Factors and Disease Outcomes

Much medical statistics use is mainly targeted against current and potential diseases; particularly for the latter, which rely on the laws of probability. Good statistical inductions are derived from history and biological reasoning. These inductions, aside from indicating certain diseases and common functional operations—such as those related to the body's circulation and respiration—also disclose to the intelligent physician additional knowledge and thus contribute to the science of medicine. Furthermore, an understanding of the role of blood chemistry steps up the doctor's medical ability. Treatment and diagnosis depend upon probability, which in turn depends upon common causes usually observed in other people.

It was resolved from the first to the last breath I take to devote all possible care in order not to injure in any way the limbs of my new born patients, postulizing that there is much potential health in them immediately after birth; for that which has just been breathed into new bodies is hard to kill [17]. Health depends upon the state of one's bones, flesh, and blood, as well as upon the services of doctors and attendants, preservation, proper nourishment, good health, the practice of Dharma, pleasing words, and the avoidance of undesired activities. Loss of health may be caused by unpleasant words, mistakes, improper treatment, the doctor's neglect of the patient's welfare, acts like entering crowded places or climbing high trees, or from humility,

anger, etc. Great attention to personal health is necessary in order to appraise disease danger, and doctors' advice is best followed. Concerning the newborn child, it is postulized that the limbs and bones of newly born children are easy to injure or dislocate; for that reason more precautions should be taken over them and they should be protected with the utmost care. All newborn children should be immediately bathed in water that has been boiled and allowed to cool.

In the 21st century both physical and mental well being and the appropriate treatment to ensure such well-being are considered important. Just as plants that grow in good soil are more luxuriant, so children who are properly taken care of become strong and tall, and are capable of producing many sons. Conversely, children who suffer through accidents and poor care will become short and weak, and may not be able to become parents who have many children. Surely it is only the children of those who, through lack of care, have shriveled and atrophied, who themselves are sickly and of weak constitution, that will not have many offspring, so the family line will die out [18].

8. Technological Advancements in Medical Data Collection

The most important issue for human beings is to maintain health. Medical life statistics can help in the diagnosis and prognosis of various diseases. The use of ICT is increasing due to its many advantages. Data types in medical life statistics include clinical data, physiological data and biochemical data. The conditions of patients can be known by using CG data, ECG data and BG data. Medical equipment is being developed for measuring devices based on smartphones [19].

The continuos glucose data collection system, ContMetS, can collect and analyze blood glucose data (BG data) for both outpatients and inpatients. It consists of an ACU (Ambulatory Care Unit) and a smartphone. The ACU has four sensors for input of CG data. The smartphone is an Android OS phone that contains the Android application to display and store the collected CG data. The CGD is transferred to the smartphone by wire connection. The collected CG data can be transferred by Bluetooth or ZigBee method connected to the Android phone.

8.1. Electronic Health Records

Health services need an effective system to communicate patient information among health professionals. Documentation and records are among the eight quality management system essentials. Smooth patient service provision requires some documentation. The quality and correctness of medical data is important both for patient care and for monitoring the performance of health service. It is important to establish quality and stability for this service. One way to achieve this is to control document flow. When quality catalog is filled, all the current processes in hospital management and administration will become stable. Wherever a good standard exists, especially the government's, there must be certain documents and records to be filled. It is necessary to strictly adhere to this when service is provided on the government project. So, in general, if there are well documented records, there will always be a good basis for, and evidence of, an audit.

Utilizing a systematic review of the literature, the acceptance of the hypothesis that a reduction in file size after the implementation of the electronic medical record system constituted an adverse effect was prevented. The employed tests cannot provide a definite acceptance of the hypothesis that implementation of the electronic medical record system at Healthcare Facility H adversely affected patient healthcare. As a consequence, there can be no definitive acceptance of the central hypothesis; rather, it can most accurately be said that the available evidence by the employed tests is consistent with the hypothesis. However, the employed tests are significantly limited by data available in the electronic records of Healthcare Facility H. The results of the tests indicate that future medical record review analyses using data from other sources, such as patient interviews, would be of value. Retesting the hypotheses with patient data from a different source would therefore be a relevant undertaking. The hospital spent a total of 4,363,776 minutes every year searching for missing paper records that were required for the continuity of care.

Optimal use of EMR would free 1728 physicians and nurses per year, equivalent to 4.74 full-time staff. Recurrent savings every year through total EMR implementation in public hospitals with annual clinical visits over 40,000 should be estimated at 77,463,576 Swedish Crowns [20].

8.2. Telemedicine and Remote Monitoring

Telemedicine is the use of telecommunication and information technologies in order to provide clinical health care at a distance. In current times this defines a rapidly developing application of clinical medicine where medical information, advice, diagnosis, or treatment is transferred to a remote site using the telephone, the internet, and other data transmission methods. Remote monitoring covers the transmission of a patient's physiological data from one place to another, usually to and from the patient's home. Patient monitoring is the continuous (and often invasive) observation and measurement of relevant changes in patients' physiological parameters and their clinical status. This allows for the timely escalation of patients who exhibit early signs of deterioration, normally triggered by an observation predictive of severe derangement of physiological function or by requesting a medical review [21]. Recent years have seen major improvements in the clinical effectiveness, usability, and economic viability of devices used to monitor vital signs. Conversely, the limitations, safety considerations and implementation issues relating to the use of these monitoring devices are not so well understood. Similarly, the clinical effectiveness of devices used to monitor more generalised physiological parameters - such as posture, physical activity, or clinical events - has received a good deal of attention and recent years have seen the increased adoption of implanted devices, providing mainstream acceptability.

9. Ethical Considerations in Medical Statistics

Ethical concerns: Medicine, which once was considered as an art, now has become a highly commercial enterprise. An array of ethical concerns has developed in modern medical practices, such as reference to placebo and giving preference to clinical trials targeting the significant findings. This generates a concern in medical statistics, because both placebo and 'significant findings' make point estimate prediction potentially deviated. As the impact of modern medical statistics is far-reaching for making correct decisions between multiple available treatments, statistical ethics should not be compromised in the medical field. Lack of understanding: Today's medical practitioners appear to put into effect various tests of significance without fully understanding associated statistical background. For example, in terms of the association between variables, several statistical tools such as linear correlation, linear regression, cross tabulation and covariance statistics could be referenced. On the other hand, these are equivalently phrased models, as each could be derived from a certain multivariate normality assumption. However, if at all applied any of such tests, references are expected to see significant nonexistent associations due to this artificial correlation [3]. Discriminatory value: Discriminatory value and information value are, in fact, also intimately interconnected, but not measured in exactly the same way. While both gauge the additional predictive power of the prediction based on prognosticators instead of nonexplanatory 'assumptions regarding characteristics' or due to 'simple random chance', the former asks this in an absolute sense, such as in the number of correct predictions, and the latter in a relative sense, e.g., adjusted odds ratio in a predictive scoring model found with a certain regression technique. Of note, this relative discriminating value is affected by the type of parameter estimation technique employed in binary modeling, covariate distribution peculiarities, choice of auxiliary estimation criterion, statistical assumptions and discriminatory power of the base model.

10. Challenges and Limitations in Medical Statistics

Most healthcare establishments rely on modern medical statistics for making crucial decisions and are now playing a crucial role in improving healthcare delivery and human survival. Recent reports suggest that ancient diseases are slowly being replaced by a new type of disease. As a result, new types of hospitals and improved diagnostic tools features enriched with modern

medical statistics are being constructed. Even large hospitals have difficulties in diagnosing some of these inborn diseases. In this respect, however, the situation is changing rapidly. Medical research studies, plus those that provide support for various other scientific disciplines, focus on the discovery of hereditary diseases. These studies are developing quickly and it is worth the effort to identify diseases that are transmitted from a previous generation, based on observed data [3]. At present there is a wide range of progress in the identification of diseases from previous generations by statistical methods.

Moreover, variational diagnostics of modern statistics is almost unlimited in character. However, to get correct and significant results in diagnosing many characteristics, one must employ complex statistical methods. Therefore, recourse to those methods and interpretation of diagnostics cause some difficulty. As a result, doctors of the ancient hospital make a mistake, there is a patient's death, and, therefore, doctors are tried to insure themselves, using easily interpretable simple methods.

11. Future Trends and Innovations in Medical Statistics

Impact of medical science in human life has increased over the past two centuries. The continuous revolution in medical science has its broad influence since it has deepened the life extension means of human being. Modern medical statistics plays an important role in the development of medical science and technology. Because, all types of medical science necessitate eminent perfection in medical statistics [3]. In particular, the new drugs medical treatment are fully dependent on pure medical statistical analysis, how the implication of statistical application is work in surgical operations frequents the certain percentage of death. Once the operation statistical analysis for surgery related refers a patient of surgery, the medical statistics measurement is just elder to almighty life creation law of a human being. On intimating this patient passed operation, his pulse rate is lowly hanging from 83° - 72° lying in bed up to five hours. There was the need to make ECG test along with intimation of passing time of operation. Here the patient’s life having the statistical measurement. This indicates after surgical operation, certain percentage arises unexpected horrors since statistics rules and measurements means a lot to surgical operations in medical realm. As a result many devices are introducing for the check up’s for doctor’s statistics in medical, practically. So, keeping this in view the medical modern test measurement has an item named stethoscope as medical statistics in surgical operation to these checkup’s much helpful along with noticed by the guidance of super specialities, along with these things emergency lights and fans, Air-condition ground facilities are also provided for the indication of ECG test available statistical measurements for safe part of operation to concern medical practitioners. Thus it has been explained the measurement of modern medical statistics tested surgical operation along with air-condition with two ton capacity facilities provided in it, introduction of statistics test equipment is five in one facilities purchase in examining the blood analysis reports of stat counter, Hartmann test half kilometer MRI scanning. Amnon test glucometer by drawing blood in glucose 210 mg/di cur of fresh blood scanning these medical statistical measurements examination the reports. From all this cross verification of examination reports here after recommended medicine. This statistics measurements estimation basis of 99% successful surgical operations predictions to the concerned statistical values will be explained by confirmed medical practitioners. [22][23]

12. Conclusion

The majority of the pitfalls in the statistical methods and results in the medical literature are attributed to the poor statistical background of the authors . There are several key points in Biostatistics that should be taken into consideration and can strengthen the Manuscript related to medical practice, in promoting scientific knowledge and improving the work with the patients for their health and welfare.

Regarding the study design, there are several key factors that should be carefully chosen before the beginning of the study. Above all, the study sample size should be estimated before the

enrolment of the first patient. Another important issue that one should pay attention to is the importance of avoiding categorization of continuous variables. Continuous variables are better analysed as continuous (e.g., age, severity, laboratory results etc) because as such they contain more information. However, if a split is necessary then it is advisable either to split them based on clinical parameters or by using computer algorithms with study subpopulation justification; otherwise, arbitrary splits are just assuming that there is a strong association.

After the data collection and concerning the results, a lot of pitfalls can be found in the medical literature. As could be expected, about a third of these pitfalls have as a cause the poor understanding of the statistical terminology and concepts. Similarly, a small percentage of these pitfalls have as a cause the poor understanding, or the complete ignorance, of the appropriate statistical methods. Statistical assumptions are mandatory for the selection of the appropriate statistical test. As a result, they should be reported in the manuscript. Regarding the results, histograms, box and whiskers should be used. When absolute values are presented, caution should be used as there are indications supporting the use of means, medians and percentiles. Additionally, the mean and the relative standard deviation should be presented. Finally, a clear study aim is useful in avoiding multiple unnecessary post hoc comparisons. Keep the number of the study aims as low as possible and justify why it is worth to adjust for different confounding variables in case a multivariate analysis is chosen.

Overall, and taking into consideration the application of these suggestions in daily practice, from a journal's perspective, completion of these forms shows that there has been careful consideration and advance planning of the statistical aspects of the study. It is always recommended that each research group should include or co-operate with an expert Biostatistician from the study design until the reporting of the results. Ironically, it may appear that journals with statistical sections have a stricter policy, whereas the emphasis is only on the adherence in previously agreed statistical analysis plan. Therefore, medical journals are encouraged to reject manuscripts with poor statistics; consequently, an emphasis is placed on the preparation and thought that takes place before even starting a study in a laboratory or in caregiving. There is always room for errors, but there are certain standards which should be met. As a result, this manuscript attempts in both a macro (writing-oriented) and a micro (graphically suitable figures) fashion to establish these standards.

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