

***Containing A systemic review on malaria and
COVID-19 symptoms with the effectiveness of HCQ and CQ***

**Summer Training report submitted to the
IIHMR University, Jaipur**

**In partial fulfilment of the requirements for the award of the
Degree of**

MBA - Hospital and Health Management

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ACKNOWLEDGEMENT

गुरुर्ब्रह्मा गुरुर्विष्णुः गुरुर्देवो महेश्वरः । गुरुः साक्षात् परं ब्रह्म तस्मै श्री गुरवे नमः ॥

This research becomes a reality with kind support and help of many individuals, I would like to extend my sincere thanks to all of them.

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THANK YOU

List of Abbreviations

- 1.CQ- Chloroquine
2. HCQ- Hydroxychloroquine
3. *P. falciparum*- Plasmodium falciparum
- 4.*P. vivax*- Plasmodium vivax
5. SARS- Severe acute respiratory syndrome
6. MERS- Middle eastern respiratory syndrome
- 7.RDT- Rapid diagnostic test
8. HRP-Histidine rich protein
9. NTDs- Neglected tropical disease
10. LMIC- Lower- middle-income countries
11. WHO- World health organization

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A systemic review on malaria and COVID- 19 symptoms with the effectiveness of HCQ and CQ.

ABSTRACT-

The coronavirus contamination 2019 (COVID-19) has become pandemic that previously rose in WUHAN, China in late early December. As of July 17, 2020, there were 1361653 affirmed cases and 585727 affirmed deaths worldwide with 213 influencing nations. Strikingly the effect of COVID 19 disease is distinctive in various nations. Likewise, COVID-19 and malarial prone to run together and their side effects may cover, general wellbeing, health care clinicians need to adjust in malaria-endemic settings. Experience from the past infection episodes has indicated that in 2014-2016 Ebola in Guinea, Liberia and Sierra Leone, have thought little of malarial control exertion and lead to a huge increment in malarial related sickness and mortalities. Thus it is fundamentally critical to continue the push to forestall, distinguish and treat malaria and COVID-19 as these two maladies are probably going to co-run together

KEYWORDS- COVID19 infection, malaria, hydroxychloroquine, chloroquine

INTRODUCTION-

Covid19 has emerged as a respiratory sickness which was first recognized toward the beginning of December 2019, Wuhan in China Hubei region, fast network, territorial, the universal spread has happened with exponential development in cases and death and become pandemic worldwide.

Globally 13616593 confirmed cases and 585727 total confirmed deaths as of July 17, 2020. The most striking feature is COVID19 impact is not the same in all

countries, regions, and territories. The European region has 3008972 confirmed cases, 205482 confirmed deaths (as of July 17, 2020) Americas region have 7154840 confirmed case, 297855 confirmed deaths (as of July 17, 2020), south-east Asia has 1308441 confirmed cases. 32100 deaths western pacific has 253495 total confirmed case, 7866 total confirmed the death, the lowest number of cases in the African region with 543122 total confirmed cases, 9130 confirmed deaths (as of July 17, 2020). Here we try to do a systemic review on malaria and COVID-19 symptoms with the effectiveness of HCQ and CQ.

Coronavirus belongs to the family of Coronaviridae and it is an enveloped RNA virus, it has a crown or halo-like appearance hence called as coronavirus. According to serological grouping, it has 4 subgroups namely, alpha, beta, gamma, delta. Seven of these viruses infected humans.

Malaria is a vector born disease caused by mosquito *female Anopheles*. Malaria caused by 4 species of the parasite *Plasmodium*, is endemic in most parts of Indian regions and other Tropical and Subtropical nations. It continues to be a major public health problem mainly due to *P. falciparum (P.F)*. As per WHO latest report in 2018 ~ 228 million cases of malaria occurred worldwide also most malaria in 2018 were in the WHO African region with 213 million or 93% of cases followed by WHO southeast Asia region with 3.4% of the cases and WHO Eastern Mediterranean region with 2.1% cases. As stated by WHO according to new modelling analysis done of 30 April 2020 they have found that the number of malarial death in sub- Saharan Africa could double if there is are a severe disruption in access to insecticides treated net and anti-malarial medicines due to COVID-19

Given our current understanding of the endemic of malaria and COVID cases distribution and analyzing various research, our investigation aims to do a systemic review on malaria and COVID-19 symptoms with effectiveness on HCQ and CQ.

METHODS-

We have searched 13 articles (that were written in English) which include 1 clinical trial with a sample size of 150 individuals who were COVID positive. The relevant studies study was explored through keywords COVID, malaria, hydroxychloroquine from diverse sources.

Literature review-

According to COVID-19 and Plasmodium vivax malaria co-infection case study which was done at Doha (Qatar) by Sundus Sardae et al published on 20 June 2020, have concluded that it is critically important to identify underlying secondary infection with concurrent SARS-Cov-2, for the physician to remember that neither co-infection with a pathogen can be ruled out when COVID-19 is confirmed nor positive test for other pathogens completely neglects the presence of COVID-19 co-infection. (Sardar et al. 2020)

When we look at COVID-19 and malaria: A symptoms screening challenge of malaria-endemic countries study which was done by Pascallina Chanda- Kaptana et al., Zambia published on 18 June 2020. They have concluded that Malaria shares many highly recognisable symptoms with COVID-19 which includes fever, respiratory-related difficulties, headache, fatigue, these malaria case could be misclassified as a COVID-19 case, if symptoms alone were used to conclude a case during emergency hence it is important to enhance and refine the resources available for COVID-19 and malaria as they are likely to co-run together. (Chanda-Kapata, Kapata, and Zumla 2020)

Comparing this to COVID-19 Mitigation Steps Provide a Blueprint for Malaria Control and Elimination which was done at New Delhi (India) by Manju Rahi, Payal Das, Amit Sharma Published on 7 May 2020. It is feasible that a dynamic and timely deployment of the intervention tools will dampen the present COVID-19 pandemic.

Maximal implementation of similar tools adapted in a disease-appropriate manner should also be considered for the control and elimination of other killer diseases such as malaria. (Rahi, Das, and Sharma 2020)

Similarly, when analyzing to Global Spread of Coronavirus Disease 2019 and Malaria: An Epidemiological Paradox study by Pietro Emanuele Napoli et al, published on 16 April 2020, suggested that prophylactic administration of antimalarial drugs in a population at risk may add a noteworthy control of SARS-CoV-2 pandemic with significant economic and social results. Even the prophylactic administration of CQ and HCQ to frontline health care professionals would help to make sure more noteworthy tranquillity in emergency management. The focal points here would without a doubt to incorporate the fast accessibility of an exceptionally low-cost drug, whose contraindications and side effects are likely to be less . Taking everything under consideration, every one of these information gives significant experiences to all more likely comprehend the first spreading mechanism of COVID-19 and to coordinate logical exploration toward the investigation of the current antimalarial drugs, (Napoli and Nioi 2020)

The results were similar to Malaria and Parasitic Neglected Tropical Diseases: by Julie R. Gutman et al published on 01 June 2020, suggests that rapidly develop surveillance platform to monitor signals of COVID-19 coinfection with malaria and other NTDs. Because it is probably going to possess to have co-infection of malaria and COVID-19 there is a shift in age pattern comorbidities to younger age then the burden of COVID-19 in LMIC may get substantially worse than predicted. (Gutman et al. 2020)

In the case review of the emergence of Undetectable Malaria Parasites: A Threat under the Radar by Khalid B. Beshiret al, published on 16 June 2020 they have shared the point of view on *P. falciparum* parasites lacking HRP2 and HRP3, and the

surveillance needed to identify them in the COVID-19 pandemic. An assortment of RDTs for SARS-CoV-2 have risen, and a comparative exertion against malaria could give an option to HRP2-based RDT in the medium term, especially in endemic settings.(Beshir et al. 2020)

As discovered in Pausing the Fight Against Malaria to Combat the COVID-19 Pandemic in Africa published by Nora Nganyewo Nghochuzie et al published on 18 June 2020 they have featured the likely effect of SARS-COVID-2 disease on malaria, especially in Africa. Repurposing of antimalarial drugs with the advancement of diagnostics for COVID-19 should be taken care of in a way that it doesn't imperil the additions gain made in controlling malarial and other endemic sicknesses Malaria finding could be combined with the COVID-19 screening and testing of suspected or affirmed COVID-19 patients to avoid misdiagnosis and engage the basic organization.(Nghochuzie et al. 2020)

As mentioned in COVID-19 and the impact on malaria report Published on 29 May 2020. Chief of the WHO Global Malaria Program, Dr Pedro Alonso, focused on the significance of keeping up malaria diagnosis prevention, and treatment exercises. Such measures were a key methodology for decreasing the strain on healthcare frameworks when additional weight is foreseen due to COVID-19. Such frameworks included proceeding with vector control, for example, bug spray rewarded nets (ITNs), indoor leftover showering, chemoprevention for pregnant ladies and small kids.(Who and Malaria 2018)

When Analyzing Africa in the Path of Covid-19 by Wafaa M et al, published on 16 July 2020 case review. It is of prime significance that assets and resources should not be diverted from the regions where there is progressing dangers from different irresistible illnesses, for example, HIV, tuberculosis, and malaria.(El-Sadr and Justman 2020)

Similarly when we have reviewed article - COVID-19 seen less in countries which are more exposed to Malaria by Gokhan Sargin et al which is published in July 2020 volume 140 Elsevier. Even though the information regarding the number of tests and health data is completed in Africa and particularly in the malaria-endemic regions is not very clear, this circumstance will turn out to be all the clearer with further investigation in the post-pandemic period. Maybe it will be imagined that the utilization of HCQ can secure COVID-19(Sargin, Yavaşoğlu, and Yavasoglu 2020).

Mentioned in an RCT of HCQ in patients with mainly mild to moderate COVID-19 disease, 2open-label randomised controlled. Administration of hydroxychloroquine didn't bring about a fundamentally higher likelihood of negative transformation than the standard care alone in patients admitted to a medical clinic with mild to severe symptoms of COVID-19. Unfavourable occasions were higher in hydroxychloroquine beneficiaries than in non-beneficiaries.(Tang et al. 2020)

What we found out in an Observational Study of Hydroxychloroquine in Hospitalized Patients withCov2 by Joshua Geleris, M.D et al published on May 7 2020, they have compared outcomes in patients who received hydroxychloroquine with those in patients who received standard care for COVID-19, using a multivariable Cox model with inverse probability weighting according to the propensity score. Variables used in this study are- Age, Gender, Patient details with race and ethnic group, Insurance holder, recorded vital signs on presentation, PaO2/FiO2 recorded at admission, recorded BMI, recorded lab test, diagnosis of the patient (past and present), Smoking status, Medication report. This observational examination includes patients with Covid-19 who had been admitted to medical care, suggests that HCQ does not bring significant changes in the endpoint of intubation or death. More RCT on hydroxychloroquine in patients with Covid-19 are required to see the efficacy of the drug.(Geleris et al. 2020)

According to the Efficacy of chloroquine and hydroxychloroquine in the treatment of CoV-2 case review by S.A. Meo, D.C. Klonoff, J. Akram. Concluded that CQ and its auxiliary HCQ have antiviral qualities in vitro. The discoveries accept the speculation that these medications have adequacy in the treatment of COVID. Individuals right now utilizing these medications for malaria sickness. It is sensibly, given the speculative advantage of these two medications, that they are currently being tried in clinical trials to survey their adequacy to battle this worldwide wellbeing emergency. (Meo, Klonoff, and Akram 2020)

Literature review Endpoint-

Hence, all these contextual analyses mainly focus on screening in malarial endemic zones as COVID-19 is probably going to co-run together. At present, it is understandable that the assets are exceptionally inclined towards COVID-19 preparedness given the sharpness at the community, health care, country level. Likewise, other challenges are that people with fever may get tested positive for COVID-19 and given standard care for according to COVID- 19 protocols then again, febrile patients may get test result for malaria when they certainty have COVID-19 symptoms. The other case circumstance is that patients may have a malarial fever with COVID-19 co-contamination, finding and treatment of one may prompt missing the other.

In the initial examination, it is thought that the chloroquine and hydroxychloroquine may be valuable, but in later on in the current assessment, stated that chloroquine and hydroxychloroquine might be significant but more randomized control trials are required future to check the efficacy of these drugs possess more side effect hence it was pulled off form the user.

RESULT-

In this investigation, we have incorporated a sum of 13 distributed article including 1 clinical trial examination. One of in vitro study investigation suggests (not conclusive) that administration of Hydroxychloroquine didn't bring about a fundamentally higher likelihood of negative transformation of COVID infection as opposed to steady standard care of COVID infection.

HCQ and CQ mode of action isn't yet known precisely for plasmodium. As plasmodium get nourishment by processing haemoglobin in their acidic vacuoles, CQ is effectively concerted in intraerythrocytic vacuoles hence higher fixation is found in infected RBC than non-infected. Since many studies have shown that 4-aminoquinolones are active in invitro against a range of virus, their efficacy has been attributed to the different mechanism, they may also affect glycosylation of ACE-2 inhibitor (Angiotensin convertase enzyme), the receptor that COVID- 19 uses to enter into the cell.

COVID-19 is as of now forced extra weight to the overstretched health care sector which is still scuffling to manage the high weight of the current burden of infection like T.B, malaria. A proactive methodology is required for screening of COVID-19 disease and malaria as those two are having some profoundly recognizable symptoms.

The key step included to recognize COVID-19 case eventually incorporate symptomatically and the high-risk patient introducing to health care services with the complaint of travel history, Malaria shares some highly recognizable symptoms like fever, headache, fatigue, breathing difficulty. Hence malaria can be classified as a COVID-19 and vice versa if symptoms alone are used to define a case in an emergency visit.

Most nations around the globe have reacted instantly to the novel CoV-2 challenge by embracing considered and experimentally guided methodologies for its control. But the circumstance is progressively perplexing for countries where malaria is

endemic, as these nations presently have to possess extra weight of COVID-19. In such countries, the health care services frameworks are either in the preliminary or regulatory period. This authorized, abrupt, and sharp pull together is probably going to bring about the disturbance of yearly malaria control exercises, for example, conveyance of bug spray impregnated bed nets, indoor showering of bug spray, support of malaria recognition, and mass arrangement of antimalarial drugs.

DISCUSSION-

Malaria symptoms may be shown within 10 to 15 days after an infective mosquito bite, multi-organ failure is commonly seen among grown-ups while respiratory difficulty is mostly expected in youngsters having malaria, mirroring what is generally seen in patients with COVID-19.

The key step to involve to identify COVID-19 case may include symptomatic and the high-risk patient introduced to health care with the complaint of international travel history, cough, fever, difficulty in breathing, fatigue, and headache. Malaria shares some highly recognizable symptoms like fever, headache, fatigue, and breathing difficulty. Hence malaria can be classified as a COVID-19 and vice versa if symptoms alone are the first guiding criteria to conclude a case in an emergency visit.

On an operational level, nations should perceive how benefits for COVID-19 and malaria are sorted out proficiently to utilize accessible resources. For example, malarial supplies could be taken to the labs and places where the COVID-19 testing is being done which diminish botched chances for malaria testing.

We without a doubt need a powerful treatment against COVID-19 however no mediation thought to be successful, even medications like HCQ and CQ upheld by the proof of adequacy later end up being more destructive than gainful, henceforth

they have been pulled back because of unfriendly response, we need more and better RCT (randomized control preliminaries) for CQ and HCQ

Nations are as yet battling to fulfil the testing need of COVID-19, while malaria kit is easily and efficiently available therefore it is necessary for provocation on the potential CoV- 2 and malaria coinfection and future guidelines for clinicians to emphasize on early detection and isolation of CoV-2 to prevent future spread of disease. Thus healthcare worker must perform a rapid screening test for malaria as they screened for COVID-19, it is very critical to respond to two diseases simultaneous to reduce mortality and morbidity. Early distinguishing of malaria and COVID-19 is basic for suitable and convenient administration, particularly in malaria-endemic regions.

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Report on Online Course

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A) Name of course- Data analytics for lean six sigma

B) Course description- 1. Data analytics technique that is typically useful within lean six sigma improvement project.

2. A brief explanation about lean six sigma.

3. How to use data analytics tools and interpretation of outcome from a different example.

C) The objective of course- 1. To understand the basic of lean six sigma

2. How data analytics technique is useful in Lean six sigma improvement project

3. To understand the basic function of software MINITAB

D) Course content- It's a 5-week programme

- Week1- Introduction to lean six sigma and DMAIC framework and introduction of data package MINITAB

- Week2- Understanding and visualizing data. Visualizing single variable as well as 2 variables. Also the distinction between numerical and categorical variables.

- Week3- Use of probability distribution. How to quantify uncertainties.

- Week4- Learned to model CTQ (y variable) and influence factor(s)(x variable) and use of a decision tree to select an appropriate tool for database testing.

-Testing of numerical y variable and the categorical x variable

- Week5- Testing Numerical Y variable and numerical X variable.

-Testing Categorical Y variable i.e. Test a relationship between a Y variable and X variable, whenever Y variable is categorical

E) Learning methodology-

- 48 videos lectures with hands-on practice on MINITAB with the data set

- 12 Readings

- 5 graded quizzes which have a minimum requirement of 80% to pass the exam

F) Key learning-

- Analyse and interpreted gathered data
- Able to use MINITAB to analyse data
- Use of statistical tool and interpretation of the outcome.

- [WEEK-1 \(9 videos, 1 Practice quiz, 1 Graded Quiz\)](#)

[Data and Lean Six Sigma-](#) Introduction about Lean Six Sigma and the software Minitab which is used for data analytics.

[1.Introduction to Lean Six Sigma-](#) It is a methodology for process improvement, and it makes use of data and data analytics. Lean Six Sigma is a data-driven approach to process improvement.

[2.DMAIC-](#) The acronym stands for 1. Define, 2. Measure, 3. Analyze, 4. Improve, 5. Control. It is a stepwise procedure in Lean Six Sigma for process improvement. Someone leading the Lean Six Sigma project is called a Belt.

[3. Selecting Critical to Quality Test \(CTQ\)-](#) In Lean Six Sigma, the CTQ is the metric which is used to change. It is often called Y-variable or dependent variable or outcome variable.

[4. Units and Measurement definition-](#) Units are things which we collect data on. Example - Objects, People. Units are always stored in the rows of the data set.

[5. Sampling-](#) Collecting a representative sampling and Minitab is used to make a random sample population.

[6. Organizing data-](#) Data can be organized in a structured way using units and variables. Variables are properties we measure, and It is always stored on the column.

- [WEEK-2\(8 Videos, 1 Practice Quiz, 1 Graded Quiz\)](#)

[Understanding and visualizing data](#) – Differentiating numerical and categorical variables. Visualizing data of both single variables and two variables using appropriate graphs.

[1. Numerical & Categorical data-](#) Numerical data are known as quantitative data has been divided into discrete and continues. Categorical data known as qualitative has been divided into

ordinal, nominal and binary data. Numerical data contains more information than categorical data

2. Descriptive analysis- Descriptive statistics are only available for numerical data. It summarizes features from a collection of information such as mean, median, Range, Standard deviation, Variance, Interquartile range etc.

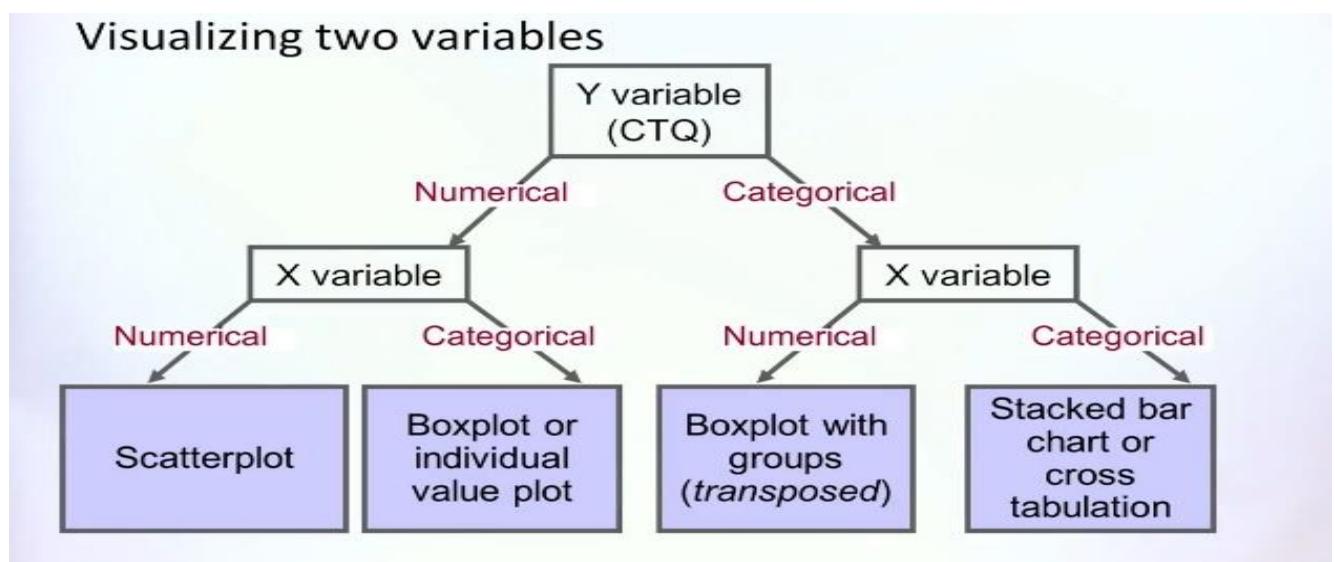
3. Visualizing numerical data- The histogram and boxplot are the graphs for the numerical data. The histogram shows the variable and gives information about the data distribution. A box plot gives information about the spread in our data and outliers.

4. Visualizing categorical data- Pie chart, Bar chart and Tally table are used for visualizing categorical data. A pie chart shows us how often each category occurs. A bar chart also gives the same information, but it is easy to identify which category occurs most often. A Tally Table gives the exact numbers.

5. Pareto Analysis- It is a chart in which Pareto principle can be seen and it counts how often each cause on the x-axis occurs. It can be helpful to differentiate the major and minor causes of the problems.

6. Visualizing two variables-

The graph to visualize two variables depends on the type of data.



- **WEEK-3(7 Videos, 1 Explanation Quiz, 1 Practice Quiz, 1 Graded Quiz)**

Using Probability Distributions- Usage of probability distributions and Quantifying uncertainty.

1.Population versus Sampling- The population is a collection of all units of interest. A sample is a subset of the population.

2. Estimation and Confidence Interval- Estimates the unknown population parameters and uses a confidence interval to quantify the uncertainty. Confidence Interval gives the boundaries where the population mean will lie in between with a certain level of confidence.

3. Probability distribution- The normal distribution is the most often seen probability distribution while in Lean Six Sigma projects, both Weibull distribution and Lognormal distribution are also relevant.

4.Probability Plot- It is a tool used to determine which distribution to be used for modelling the population. It can be used to spot data anomalies. Depends upon the data which lies on the straight line, it can be classified into good fit and poor fit.

5.Empirical CDF- It is used in the analyze phase of the project and it is used to calculate percentages.

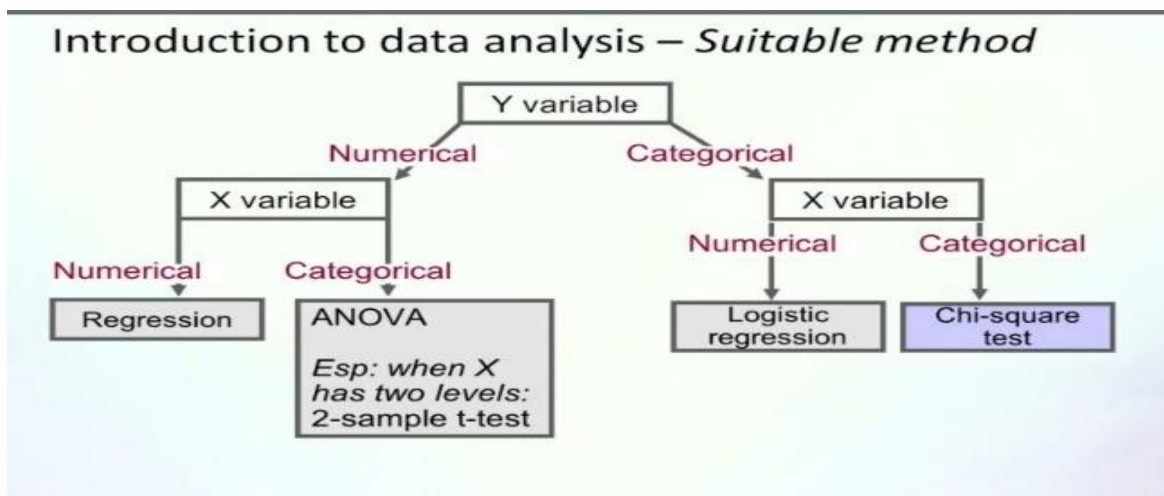
6.Properties of Normal distribution- It is symmetrical looks like a bell-shaped. It is even called the Gaussian curve. The shape of the distribution is determined by the parameters location parameter (μ) and dispersion parameter (σ).

- WEEK- 4(9 Videos, 2 Explanation Quiz, 2 Practice Quiz, 1 Graded Quiz)

Introduction to Testing -Modeling CTQ and influence factors and selecting appropriate tool for data-based testing of the models.

1.Introduction to data analysis – In the Lean Six Sigma project, the main intension is to know whether CTQ is related to the influence factor or not. The suitable method depends on the type of data that is the CTQ and the influence factor is categorical or numerical variable.

2.Hypothesis Testing – This is done to find the effect between the variables. The null hypothesis and alternate hypothesis stated have to be checked following the P-value. If the P-value is smaller than 0.05, reject the null hypothesis. If P-value is larger than 0.05, do not reject the null-hypothesis.



3.Causality- It is about the cause & effect of relationships, example if x variable changes y variable also changes. So, the relationships should be interpreted judiciously to avoid mistakes.

Testing numerical Y and categorical X- Establishing a relationship between numerical Y variable (CTQ) and categorical influence factors (X variables).

4.Introduction to ANOVA- It stands for analysis of variance. It is used to study the relationships between numerical Y and categorical X variable. It consists of 2 steps, 1. Organize data, 2. ANOVA and 3. Residuals. The two assumptions of ANOVA are 1. The distribution should be normal and there will not be any outliers.

5.ANOVA analysis – The hypothesis test using p-value is done to find the significant relationship between the variables. The R-square value gives the relevancy of the influence factor.

6.ANOVA residual analysis- This is done to validate the assumptions underlying ANOVA. To validate the assumptions, it must be checked that the residuals are normally distributed and there are any outliers or other irregularities present.

7.Kruskal-Wallis Test- This is a non-parametric test used as an alternative to ANOVA when the assumptions are not met.

8.Two sample t-test – This is used to analyze the difference between the means of two groups. The P-value obtained can be used to calculate whether the mean difference is coincidental or truly significant.

9. Test for equality of variances-This is used to test the variability across groups as variation shows the consistency of the variables. The hypothesis test shows the consistency of the variance.

- [WEEK-5\(8Videos, 3 Explanation Quiz, 2 Practice Quiz, 1 Graded Quiz\)](#)

Testing: numerical Y and numerical X- Statistical tests to relate a numerical Y variable (CTQ) and numerical X variable (influence factor).

1. Correlation- It shows the strength of the relationship between two numerical variables. It is always between the value -1 and +1. A negative correlation shows that the variables are correlated in the opposite direction. Correlation of 0 means there is no relation between the variables.

2. Regression- This is a statistical method to test whether two numerical variables are related or not by calculating the best fitting line. Regression analysis is about finding the values of a and b from the formula $y = a + bX$. Regression analysis consists of 4 steps respectively

- a. Make a fitted line plot to visualize the data,
- b. Perform main Regression analysis,
- c. Perform residual analysis,
- d. Calculating the prediction interval.

3. Regression Analysis- The hypothesis shows the significant relation and the R square shows the strength of the relationship.

4. Regression Residual analysis- If the residuals are normally distributed and show no outliers or irregularities then the assumptions can be proved. If not, then the quadratic regression model can be used.

5. Regression prediction interval- This can be used to determine the level of influence factor, which ensures a certain CTQ performance.

6. Quadratic Equation- This is used when the linear regression analysis is not meeting the assumption. A curved line fits the data instead of a straight line.

Testing categorical Y- The testing relationship between a Y and X variable, when Y variable (CTQ) is categorical.

7. Chi-Square analysis- It is used to find the relation between a categorical Y and categorical X variables. This has two steps,

- a. Cross-tabulation of data,
- b. Chi-square analysis and p-value. The p-value shows the significance of the relationship between the variables.

8.Logistic Regression- It is used to find the relation between a categorical Y and numerical X variables. This consists of 3 steps,

a. Enter data in event/trial format

b. Make a fitted line plot,

c.P-value: The p-value shows the significance of the relationship between the variables.

Course completion overview

 Explore ▾

What do you want to learn? 

  akriti dubey ▾


Overview

Grades

Notes

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Messages

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Course Info

 You passed this course! Your grade is 90.00%.

Item	Status	Due	Weight	Grade
 Graded quiz - Data and Lean Six Sigma Quiz	Passed	May 3 11:59 PM PDT	20%	90%
 Graded quiz - Understanding and visualizing data Quiz	Passed	May 10 11:59 PM PDT	20%	100%
 Graded quiz - Using probability distributions Quiz	Passed	May 17 11:59 PM PDT	20%	90%
 Graded quiz - Introduction to testing & Testing: nu... Quiz	Passed	May 24 11:59 PM PDT	20%	80%
 Graded quiz - Testing: numerical Y and numerical X... Quiz	Passed	May 31 11:59 PM PDT	20%	90%