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A STATISTICAL ANALYSIS ON RECOVERY CASES OF COVID19 IN INDIA

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ABSTRACT –

In this report the positive cases of Covid19 in India with effect from 7th September ,2020 to 25th October ,2020 are analysed for statistical relevance . The scattered data are used to find out a model equation correlating two variables number of recovered Covid –patient with an interval of regular seven days . The best fit regression analysis shows a significant correlation of Pearson coefficient (r) with standard error (s) with a probable lower mortality rate . **Finally the limitations of this analysis is discussed herewith .**

Keywords – Covid19, Best fit regression , Hyperbolic fit , Recovery rate , Reproducibity of research

INTRODUCTION :

The important statistical parameters used to explain an epidemiology like Covid19 better Known as mortality rate(MR) , case fatality rate (CFR), Infection fatality rate(IFR)**[1,2 ,4]** . The mathematical model like Susceptibity – Infectivity – Recovery (SIR) **[3]**used mostly to quantify the different epidemiological stages . The stages are namely viral inoculation , spreading of viral infection and finally recovery from Covid19 . The statistical models from best fit data analysis also used to explain the above epidemiological parameters (MR , CFR , IFR) are nonlinear regression modelling like hyperbolic regression , nth order polynomial regression , MMF regression , logistic or sigmoid regression . In this article the final stage of SIR modelling, Recovery stage**[3]** is analysed by best fit regression .

METHODS AND DISCUSSION [6]:

1. Data Availability – a set of data (**Figure – I**) of number of days with seven days interval vs number of recovered cases with effect from 7th September – 25th October ,2020 .

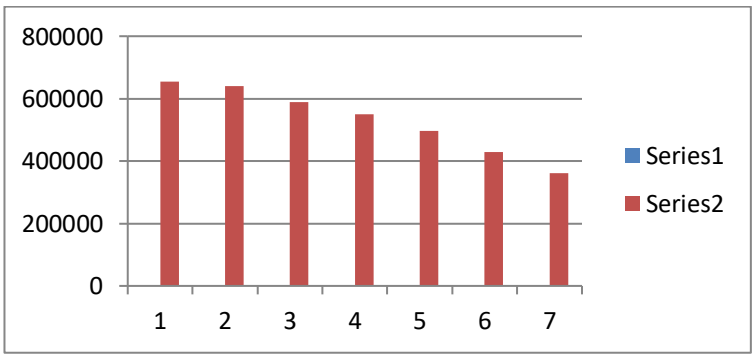

Figure – I

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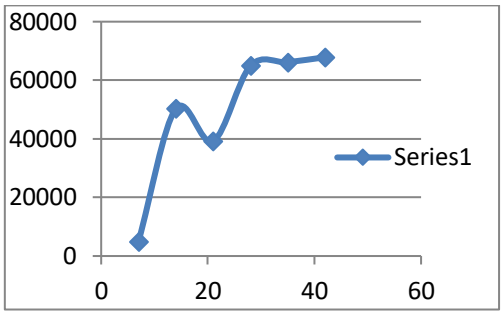
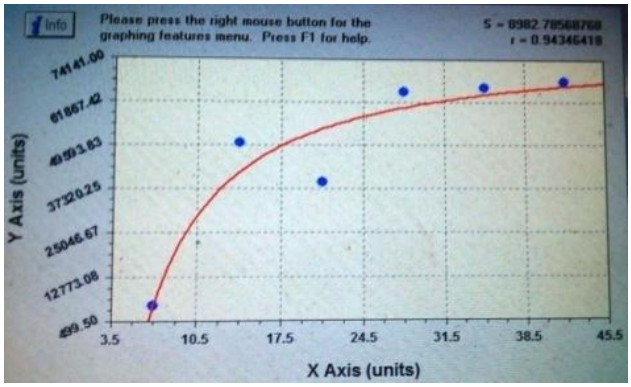


Figure – I : Excell plot of scattered data (**5**) of number of days with seven days interval (x-axis) vs number of positive Covid-cases (y-axis)

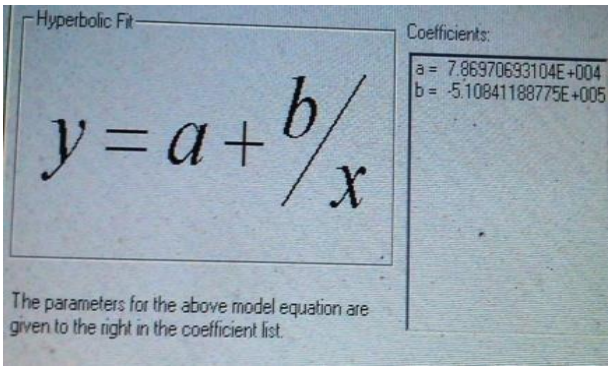
Data Informatics Tool: Standard Statistical Software **Curve Expert v.1.4**.

RESULTS AND DISCUSSIONS [7,8,9,10]: The results may be considered as output of the standard software analysed by a best fit regression methods to calculate the most important statistical parameters like model equation , Pearson coefficient (r) , standard error (s) , chi-sq relevance , covariance matrix and residual table.

The output of software after execution of dataset



(**Figure –II**)



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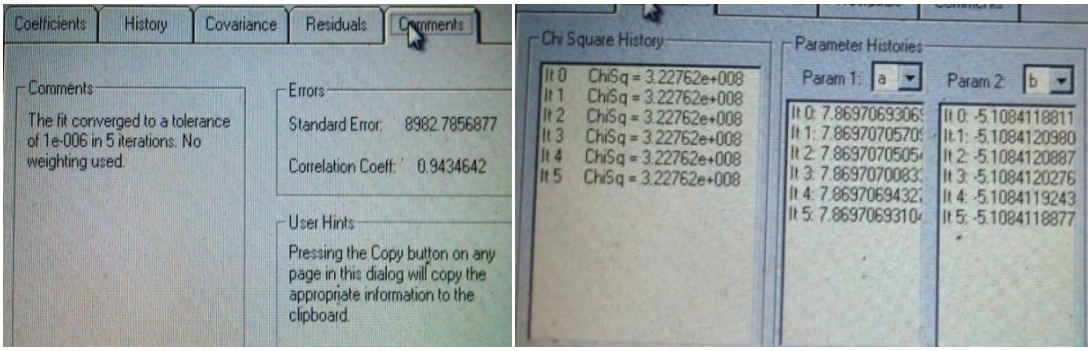

Figure –II : t –axis – time in number of days , n-axis – number of recovered cases in each seven days

interval .The model rate equation [time in days ,t = f (number of recovered cases ,n) can be executed as hyperbolic best fit**(2)** as follows :

t = 7.8697*10^ 4 – (5.1084*10^5 / n)_____(equation 1.0)

[Where a = 7.8697 * 10^ 4 , b= 5.1084*10^5 are called coefficient of hyperbolic fit]

CONCLUSION [9,10 ,11] :

The best fit statistical analysis of hyperbolic fit (equation 1.0) resumes a significant Pearson coefficient (r) , standard error (s) . The statistical data execution may be analysed as collection of Covid19 recovery data to fit in a standard statistical software like Curve Expert 1.4 to get the hyperbolic fit in **Figure –II** by calculating Chi-Sq hypothesis , covariance matrix -2x2 ,Residual mean , the final result of correlation coefficient (r) with a standard error, equal residuals , r= 0.9464 (0< r < 1) , S= standard error= 8983– 1* 10^(-6) iterative convergence] **.** Although the correlation signifies the relevant recovery rate with a **probably** low mortality rate **[4]** . The major limitations of this theoretical method is that lower frequency ,only six numbers of dataset with irregular scattered data explains **the poor biological reproducibility [11]of SARS-COV-2 mutants** to predict the relationship of long term recovery of active SARS-COV-2 patients naturally **very difficultly predict the mortality rate [4] .**

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