A Statewise Statistical Analysis on Covid19 Cases in India at Different Temperature

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Method Article

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Abstract

In this method the recent status of Covid19 cases throughout the India, statewise in November ,2020 is analysed statistically. The active, recovered and death frequency of Covid19 starting from northern, western, eastern and southern India at different temperature have been studied. The states covered under interest are Himachal Pradesh , Punjab, Haryana, Rajasthan, Uttar Pradesh, Maharashtra, Gujarat, Odisha, Westbengal, Karnataka and Andhrapradesh. In the each state the frequency datasets are analysed through best-fit regression shows the minimum infection trend of Covid19 in Himachal Pradesh with maximum in Maharashtra with increase in Temperature at different geographical locations.

Introduction

Earlier report (1) has been analysed statistically the Recovery cases of Covid19 in India with a regular interval of seven days. In the present report the best fit regression analysis is used as the most powerful tool for trend analysis combined with spreadsheet chart (for 2D-3D). It is a kind of epidemiological simulation applied to Covid19 pandemic (2) in India. It is a very stringent Indian challenge (2) to minimise the infection frequency (3) followed by death (4). The major objectives of this study is to represent a real picture of Indian population state wise affected with SARS-COV-2 and secondly the variation of epidemiological parameters like Infection and recovery frequencies with respect to death frequencies along with temperature. In European region a probabilistic research of SARS-COV-2 has been done by Aroon Chande et al (5) through GPRS tracking system.

Methods

Availability of Public Data – (REF : 6 and REF : 7, 8) .

Standard software used for best fit analysis – Curve Expert 1.4

TABLE - I (11x6) (6,7,8)

29330	1102	22161	0.0375	0.7557	21
140605	4428	130406	0.0314	0.927	22
197952	2011	176403	0.0106	0.8911	20
223633	2056	203524	0.0092	0.91	18.5
509903	7354	479182	0.0144	0.939	18
1744698	46881	1612314	0.027	0.9241	25
187078	3794	170894	0.02	0.9135	27.5
307906	1563	296516	0.00507	0.963	22
428498	7610	390096	0.01776	0.91	22
860082	11527	820590	0.0134	0.954	22
852955	6854	826344	0.008	0.9688	27.5

A data matrix (11 x 6) has been constructed from REF : 1 and REF : 2 , REF :3 considering the eleven number of states in eleven rows with six variables like Covid – active , death , recovered frequencies ,Recovered and Death fractions and finally temperatures of each states . Spreadsheet (Excel) distributions of state wise Death frequencies Vs Temperature . (PIE Representation of Death frequencies with state wise temperature . CHART –I to CHART IV (10) showing 2D representation (Column – 2 Vs Column – 6) . The 3D representation of the said matrix (Column – I to Column -6) variables with eleven number of columns represent Surface – Volume representation (CHART – V),Infection Contour (3) representation (CHART- VI ,VII) (10).

Results And Discussions

(9,11): The results may be considered as the execution of Excel 2007 (Spreadsheet) followed by Curve Expert 1.4 of the concerned data of TABLE – I .

A plot of column 1 (Frequency of Active cases ,X axis) vs Column 2 (Frequency of Death cases , Y axis) shows a Polynomial regression fit of 4th degree(11)(Fig-I).

A plot of Column 2 (Frequency of Death Cases , x axis) Vs Column 5 (Fraction of Recovered cases , Y –axis) shows an Exponential regression fit (11)(Fig-II).

Conclusion

(5, 9, 11-13)

The 2D parametric variation of Temperature Vs frequencies of death cases(mortality) shows a minimum in Himachal Pradesh (21 deg C) reaches a peak in Maharashtra and (27.5 deg C) then sharply lowering down in Odessa(22) and again having a rising trend in Westbengal (22) reaching maximum in South Indian states of Karnataka (22) and Andhrapradesh (27.5) with respect to mortality or frequencies of Death cases .(Spreadsheet **CHART –I to CHART – IV**).The composite 3D variation including Frequencies of active – death – recovered cases , Death and Recovered fractions of eleven Indian states showing a Surface –Volume change (**CHART-V**) and spreading of the Infection Contour (**CHART- VI – VII**) at different Temperature (**5, 10**).

The statistical analysis (**11-13**) of Frequencies of Active – Death – Cases , Recovery fractions at different temperature are relevant with a Correlation values (r) of 0.9906 – 0.9920[1×10^{-6} in 10 iterations] with Cov matrix (**12**) [4x4] , [2x2] , Chisq hypothesis , and final correlations of (r) and (s) respectively for the month of November,2020 . But the above statistical analysis may be made more prominent with much more frequencies starting from March ,2020 till date of Active – Death – Recovered cases with a variation of temperature are to be repeated with same methods of analysis . Although the higher temperature increases the infectivity of active cases followed by mortality fraction (**4**) but due to oscillatory nature of Covid19 mutants originate a great question about the reproducibility (**13**)of the said study as a limitation of this work .

Declarations

Link data and Coding: 14,15 (JSON EXPORT) .

CONFLICT OF INTEREST: I declare that I have no competing as well as conflict of interest .

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Charts

Figures

Figure 1

Polynomial Fit

Figure 2

Exponential Fit

Figure 3

Infection spreading contour

Figure 4

Surface -Vol distribution of Covid19 Infection Statewise in India

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [CHARTS.docx](#)
- [SupplimentarydataonIndianCovid19Cases.docx](#)