

Prediction of number of deaths due to Covid-19 Pandemic in India.

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Abstract –

Covid-19 is an infectious disease caused by a newly discovered coronavirus. This disease was first detected in Wuhan, China.

In India, cases of COVID-19 was seen from Feb’20 however death due to this was observed from Mar’20.

Corona is new pathogen of a previously known type hence named as Novel Corona Virus. This disease is suspected to originate from an animal host (zoonotic origin) followed by human-to-human transmission

In this article, we have taken data of day wise deaths in India and used Nonlinear Regression tool to predict number of deaths by May’20. This analysis will help to take necessary preventive actions to control spread of disease.

Key Words:MS-Excel, Nonlinear regression method, Scatter Plot, Simple bar Chart.

1.Introduction

COVID-19 is the infectious disease caused by the most recently discovered coronavirus. This new virus and disease were unknown before the outbreak began in Wuhan, China, in December 2019.

The most common symptoms of COVID-19 are fever, tiredness, and dry cough. Some patients may have aches and pains, nasal congestion, runny nose, sore throat or diarrhea. These symptoms are usually mild and begin gradually. Some people become infected but don’t develop any symptoms and don’t feel unwell. Most people (about 80%) recover from the disease without needing special treatment

As of 12-Apr-20 5PM below are the count of Corona affected in India

Active Cases – 7409; Cured/Discharged – 764; Deaths - 273

India as of current data, mortality rate is around 3.6%

2.Methodology

For analysis, I have taken data of number of deaths in India till date & try to predict number of deaths in near future using regression. Data is plotted as scatter plot & fit the correct regression model. As per analysis, second level Polynomial curve is applied.

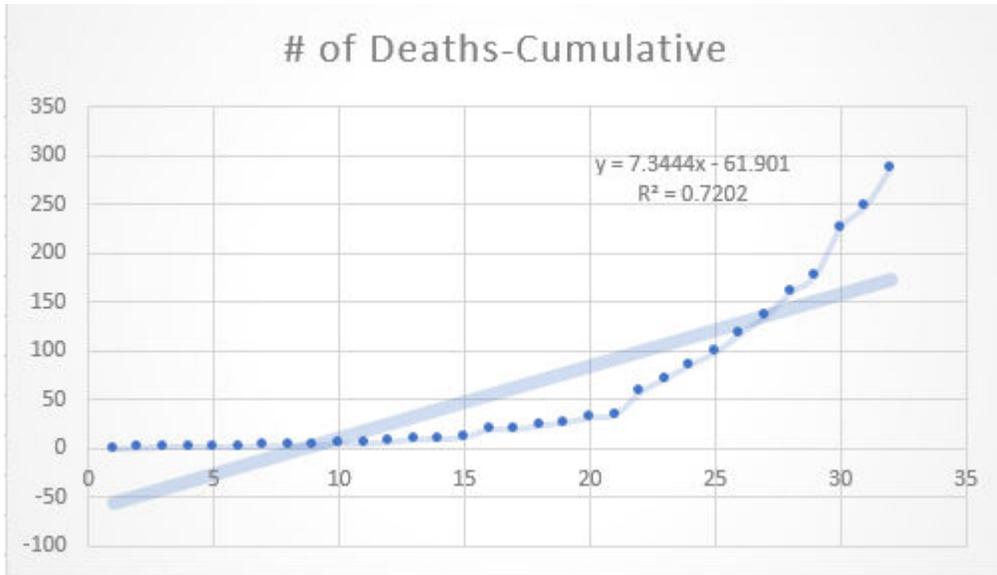
Data taken as below –

Date	# of days	# of Deaths-Cumulative	# of Deaths-Daily
12-Mar	1	1	1
13-Mar	2	2	1

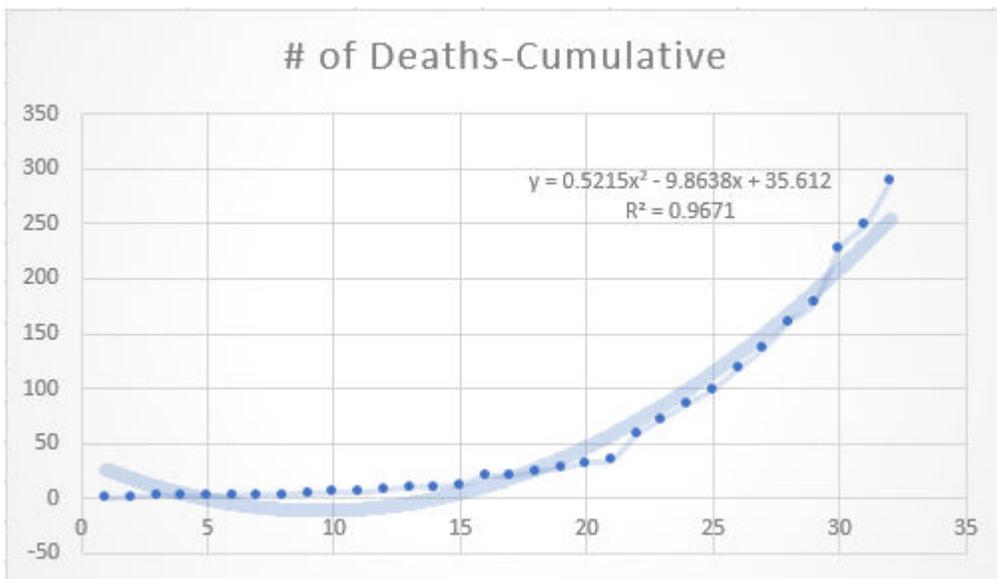
14-Mar	3	2	0
15-Mar	4	2	0
16-Mar	5	2	0
17-Mar	6	3	1
18-Mar	7	3	0
19-Mar	8	4	1
20-Mar	9	5	1
21-Mar	10	5	0
22-Mar	11	7	2
23-Mar	12	10	3
24-Mar	13	10	0
25-Mar	14	12	2
26-Mar	15	20	8
27-Mar	16	20	0
28-Mar	17	24	4
29-Mar	18	27	3
30-Mar	19	32	5
31-Mar	20	35	3
1-Apr	21	58	23
2-Apr	22	72	14
3-Apr	23	86	14
4-Apr	24	99	13
5-Apr	25	118	19
6-Apr	26	136	18
7-Apr	27	160	24
8-Apr	28	178	18
9-Apr	29	227	49
10-Apr	30	249	22
11-Apr	31	288	39

MS-Excel Analysis –

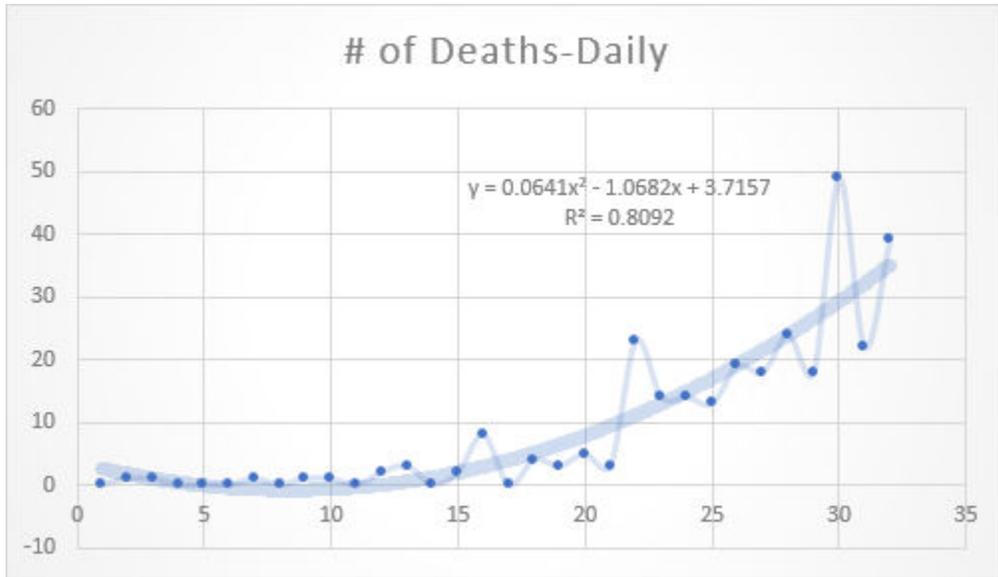
Linear Trend – R square value as 0.7202



Second level Polynomial Trend – R square value as 0.9671



Similarly, trend plotted for daily deaths as below



With this we have used 2nd level Polynomial regression as R square value is higher than Linear model. Second degree nonlinear model has equation as $Y=a+bx+cx^2$ where

Y = # of Cumulative Deaths as a dependent variable

X = Days as an independent variable

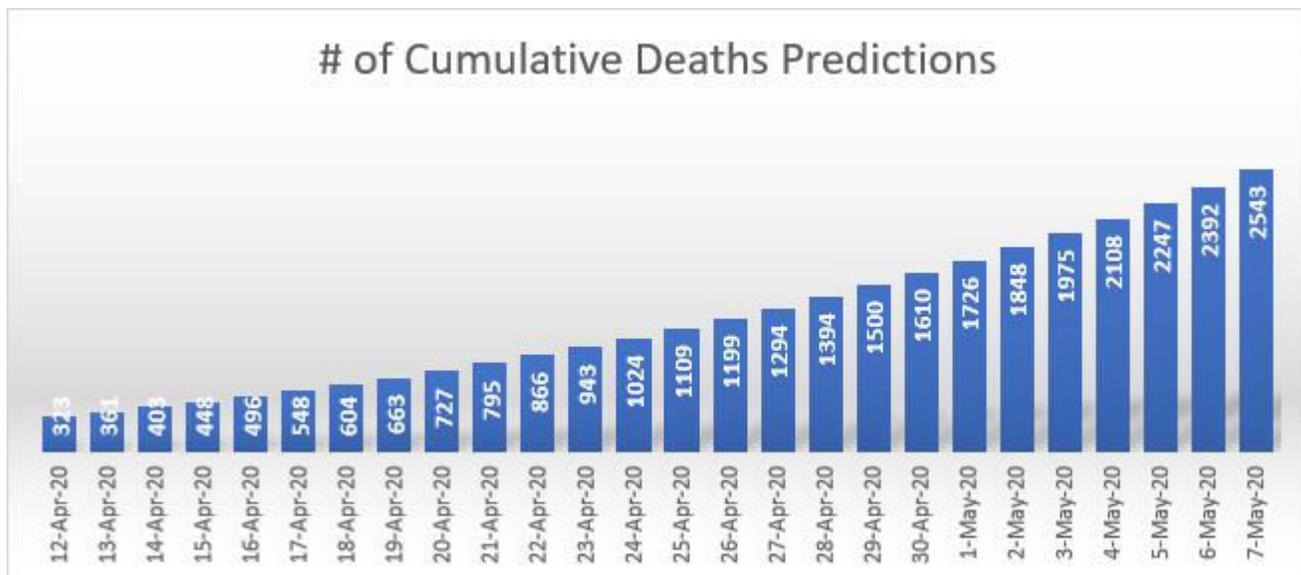
a, b, c – constants of the equation

Below table summarize use of equation for predicting # cumulative deaths in next 25 days as below

Equation	→	$0.0641x^2 - 1.0682x + 3.7157$	$0.5215x^2 - 9.8638x + 35.612$
Date	# of Days	# of Daily Deaths Predictions	# of Cumulative Deaths Predictions
12-Apr-20	32	35	323
13-Apr-20	33	38	361
14-Apr-20	34	41	403
15-Apr-20	35	45	448
16-Apr-20	36	48	496
17-Apr-20	37	52	548
18-Apr-20	38	56	604
19-Apr-20	39	60	663
20-Apr-20	40	64	727
21-Apr-20	41	68	795
22-Apr-20	42	72	866
23-Apr-20	43	76	943
24-Apr-20	44	81	1024
25-Apr-20	45	85	1109
26-Apr-20	46	90	1199
27-Apr-20	47	95	1294
28-Apr-20	48	100	1394

29-Apr-20	49	105	1500
30-Apr-20	50	111	1610
1-May-20	51	116	1726
2-May-20	52	121	1848
3-May-20	53	127	1975
4-May-20	54	133	2108
5-May-20	55	139	2247
6-May-20	56	145	2392
7-May-20	57	151	2543

Chart for predicted Death numbers –



3. Conclusion

With this regression analysis, data concludes that by 7-May-20, # of expected deaths are tentative 2500+ This data will help to bring awareness in people to strictly follow directives given by Indian Government to reduce impact due to spread of Corona Virus epidemic.

4. References:

1. <https://www.who.int/news-room/q-a-detail/q-a-coronaviruses>
2. <https://www.worldometers.info/coronavirus/country/india/>
3. <https://www.mygov.in/covid-19/?cbps=1>
4. <https://en.wikipedia.org/wiki/Polynomial>