Asian Journal of Research in Computer Science

11(2): 16-28, 2021; Article no.AJRCOS.71539
ISSN: 2581-8260

An Effective Prediction on COVID-19 Prevalence for India and Japan using Fbprophet Model

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: 10.9734/AJRCOS/2021/v11i230258
Editor(s):
(1) Dr. R. Gayathri, Anna University, India.
(2) Prof. Manish Mahajan, CGC College of Engineering, India.
(3) Dr. Dariusz Jacek Jakóbczak, Koszalin University of Technology, Poland.
Reviewers:
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(4) Veena Gode SwamyRao, Visvesvaraya Technological University, India.
Complete Peer review History: https://www.sdiarticle4.com/review-history/71539

Original Research Article

Received 09 July 2021
Accepted 09 August 2021
Published 19 August 2021

ABSTRACT

Coronavirus has become a significant concern for the whole world. It has had a substantial influence on our social and economic life. The infection rate is rapidly increasing at every moment throughout the world. At present, predicting coronavirus has become one of the challenging issues for us. As the pace of COVID-19 detection increases, so does the death rate. This research predicts the number of coronavirus detection and deaths using Fbprophet, a tool designed to assist in performing time series forecasting at a large scale. Two major affected countries, India and Japan, have been taken into consideration in our approach. Using the prophet model, a prediction is performed on the number of total cases, new cases, total deaths and new deaths. This model works considerably well, and it has given a satisfactory result that may help the authority in taking early and appropriate decisions depending on the predicted COVID situation.

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Keywords: COVID-19; prediction model; Fbprophet; time series analysis.

1. INTRODUCTION

Coronavirus is a respiratory virus triggered by a plain intense respiratory disease that causes infections to humans and animals. The novel coronavirus disease (COVID-19) is a new virus discovered throughout the whole world. None of us is ready to fight against this. The deadly pandemic has caused millions of deaths worldwide by establishing itself as the world's worst incubus. However, the first Covid-19 case was identified in Wuhan, China, in December 2019 [1]. COVID-19 spread from individual to individual over the respiratory stretch after coughing, sneezing, or breathing of an infected person. A new infection occurs when inhaled droplets or aerosols from an infected person enter the mouth, nose, or eyes in close contact with an infected person [2]. By the end of May 2021, the number of COVID-19 patients identified globally has reached about 160 million, and more than 3.5 million people have already died [3].

In an attempt to monitor the expanse of the virus, governments worldwide have taken several close observations, such as social distances and clothing masks, surgical masks, respirators, or other facial coatings to control stem infections.

Predictive analysis of COVID-19 has already become a popular research area. Besides, modelling and predicting the day-to-day expanse of the virus can help frontline healthcare professionals prepare for the compromise of an impending number of patients. Accurately predicting the disease is a matter of concern because it can affect government policies and control rules, health systems, and social life. In this circumstance, we introduce the predictive capabilities using the Fbprophet forecasting model. This paper proposes a predictive model that uses the Fbprophet framework and probability to forecast outcomes, and Time-series analysis is also performed here. This model has been used to predict new cases, total cases, new deaths, and total deaths of people in India and Japan. The main objective of our proposed model is to help the authority in making decisions by predicting the upcoming affected and death number due to COVID-19.

This model will play an essential role in handling the COVID-19 pandemic in India and Japan in the upcoming waves. The author also thought that it might be possible to determine coronavirus outbreaks in future events with this model.

2. LITERATURE REVIEW

Various research work is underway to assess and capture the global catastrophe of COVID-19 on the human race. The research studies include predictions about future cases and an analysis of moving liable for the Covid tract. Chintalapudi et al. [4] adopted a seasonal Arima model to predict data from 19 cases in Covid-Italy, until March 2020. They analyzed the impact of the two-month lockdown in Italy and observed a decrease in the number of cases recovered due to the lockdown and a reduction in confirmed cases. Alibi et al. [5] have used the Fbprophet model to predict the spread of COVID-19, where they represented the number of confirmed and predicted deaths, and their model was accurate near 79.6%. Ribeiro et al. [6] studied predictive assessments of models using COVID-19 day-level cases from ten states in Brazil. Conferring to the authors, the piling ensemble and SVR achieved better than the Arima, Cubist, Ridge and RF models for the accepted standards. Fanelli et al. [7] established and studied the Arima (P, D, Q) model of the COVID-19 epidemic trend in three countries; Spain, Italy, and France. They suggested that the Arima models are suitable for forecasting the spread of COVID-19 for the coming days. Parikshit et al. [8] predicted using COVID-19's treatment perspective by Fbprophet model because of the open-source algorithm, accuracy, and fast data fitting. Using the prophet model, they forecast 1.6 million infected patients worldwide by May 2020 and 2.3 million by June 2020. Aditya et al. [9] used a humble hitherto active mathematical model to forecast the futurity of India using standing data. They also valued the result of social separation through time-dependent coefficients of the model. The model study with the correct odds indicates that the epidemic will be at its peak in late June or the first week of July. About 108k Indians are likely to be infected when the lockdown will be relaxed after three months. Wynants et al. [10] focused on studies involving the diagnosis of COVID-19 and the number of predictions that may be transmitted in the future. The authors recommended that investigation based COVID-19 data have to be made publicly available to inspire more precisely designed recognition and prediction models. Pandey et al. [11] operated two arithmetic algorithms to

estimate and forecast the spreading of COVID-19 in India. They applied a dataset reclaimed from the John Hopkins University source. Kumar et al. [12] forecast the COVID-19 blowout in the 15 most transited countries with the model of ARIMA. The product of their prediction shows that circumstances would deteriorate in Iran and Europe, mainly in Italy, Spain, and France. Likewise, their prediction showed that more constant cases were found in mainland China and South Korea.

3. METHODOLOGY

Numerous outbreak prediction models for COVID-19 are castoff by officials around the world to make resolutions and implement relevant control measures. Among the standard models for the COVID-19 global pandemic forecast, we used the Fbprophet model to predict the covid cases.

3.1 Predictive Model

Predictive analyzes are branches of advanced analysis that are used to make predictions toward incognito future events. It uses many methods of data mining, statistics, modelling, machine learning and artificial intelligence to investigate current data to predict the future. This is an effective way to add intelligence to our application for predicting consequences alongside new data. In our approach, we used the Fbprophet model with Python language for making a predictive model for COVID-19 case prediction.

3.2 Fbprophet Model

Fbprophet is an uncluttered source framework for Facebook to predict the time series [13]. This is a prediction process applied to Python that offers quick and fully automated predictions that data scientists and analysts can manually tune in and use to predict the results for future observations. It provides spontaneous parameters that are tranquil to tune. Even somebody who deficiencies the skills of time series forecasting models can use it to produce expressive predictions.

3.3 Time Series Forecasting

A time series is an instruction at data points that are recorded at reserved time points most of the time at fixed intermissions (seconds, hours, days, months, etc.). Each corporation produces a large quantity of data every day for its auctions statistics, pays, circulation, or operating expenditures. Time series can create valued evidence for data mining, long-term business choices, yet they work in most companies. Below is a list of possible ways to take advantage of time series datasets: Trend Analysis: Only plotted data against time can generate a lot of strong insight. Very early use of data only understands the temporal pattern/trend measuring [14]. It can even give an initial indication of the overall direction of a general business hoop in business. Predictions: Predicting future values using historical data is a general method for data extrapolation. Predictive Analysis like advanced statistical analyzes, such as panel data models heavily rely on multi-variant longitudinal datasets [15]. This type of analysis helps predict business, identify explanatory variables, or understand connections between the properties of a dataset. In our case, the predictive analysis is performed to predict the future situation of COVID-19 epidemic and show the gap that affects the whole world.

3.4 Data Source and Research Material

The large dataset of COVID-19 was collected from a publicly available repository of Kaggle. The dataset link is provided here: https://www.kaggle.com/bolkonsky/covid19. The workplace that we have used for implementation is GoogleColab, where the scripting language is Python3. Matplotlib is used for data visualization.

3.5 Research Design

Here in Fig. 1, the research design is represented in the form of a flowchart.

At first, we collect the dataset from Kaggle that reports new COVID-19 cases and total cases, new death, and total deaths for India and Japan. Then we import the dataset in GoogleColab and create a date frame for convert the given series object to date frame. Then data is split for training and testing, 80% data is for training and 20% for testing. Next, we create our model and fit the model with train data. We used this model because fully automated forecasting techniques can be fragile [16], and they are often not too complicated to include proper guesses or heuristics. After that it makes a future date and made the prediction with that. Afterwards, we show a visualization of the comparison between predicted data and original data. The effect of COVID-19 is shown on a weekly, yearly basis through visualization.

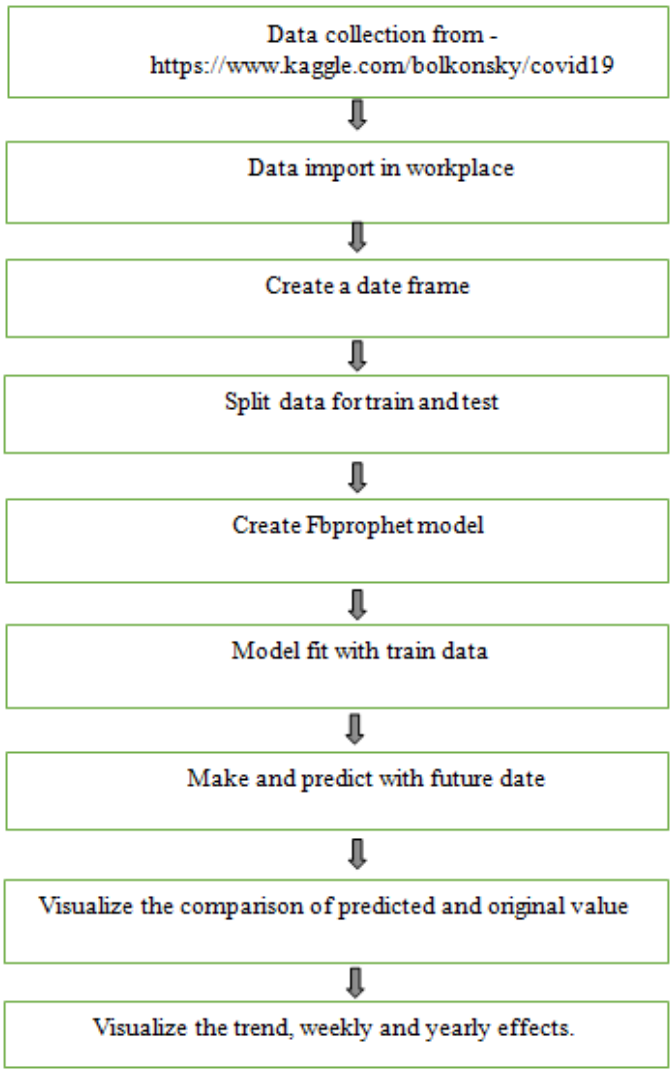

Fig. 1. Flowchart of research design

4. PREDICTIVE MODELING

4.1 Forecasting of COVID-19 Cases for India with Prophet based model

Table 1 displays COVID-19 new cases of India that forecast Yhat (indicating the accurate prediction), yhat_lower (minimum forecast) and yhat_upper (maximum forecast). Here, the standard prediction value is 46913, minimum and maximum prediction values are 34768 and 59161, respectively.

Fig 2 indicates the relationship between the black dotted line, which marks the predicted value and the solid line as the actual value in the new case of COVID-19 in India. The predictions and key values we see in Fig. 9 run the same way. Here, we see some errors that the effects of the coronavirus were getting worse at the moment.

Table 2 shows the COVID-19 forecast of India, where yhat indicating the accurate prediction, yhat_lower is the minimum forecast, and yhat_upper is the maximum forecast for the next 60 days. So based on the table above, the number of new death till 2021-04-06 is increasing to 108. We imbibe from Table 2 that people are affected day after day, and it increases both the actual value and the predicted value significantly. The predicted values will increase slightly compared to the actual values.

Table 1. Forecasting of new cases

	Date	yhat	yhat_lower	yhat_upper
426	2021-03-31	45988.905232	33331.119869	58772.268267
427	2021-04-01	45904.084206	34317.240120	57849.267510
428	2021-04-02	46665.877903	34199.683831	58524.455565
429	2021-04-03	47917.355130	36006.815581	60012.879981
430	2021-04-04	46586.293051	34466.093271	59377.519147
431	2021-04-05	43124.592240	31466.280872	55356.148018
432	2021-04-06	46913.739800	34768.394670	59161.419776

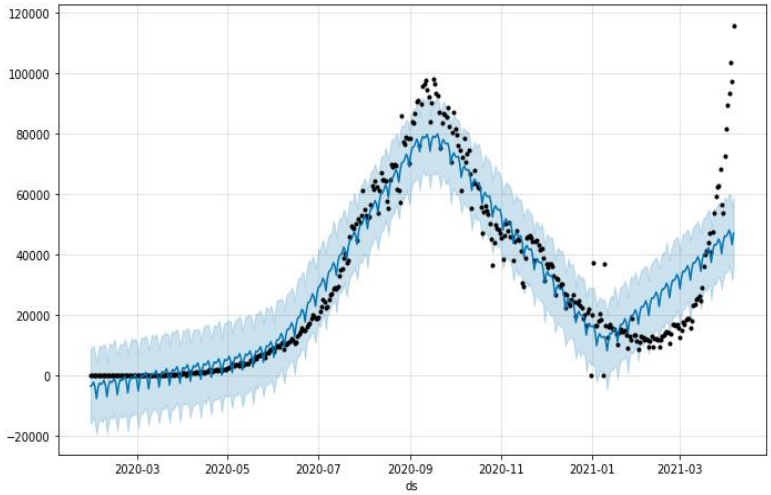

Fig. 2. Predicted value vs Actual value for new cases

Table 2. Forecasting of new deaths

	Date	yhat	yhat_lower	yhat_upper
426	2021-03-31	101.345369	-66.955130	245.077139
427	2021-04-01	93.844757	-65.718594	238.597509
428	2021-04-02	88.521151	-58.640266	245.467072
429	2021-04-03	84.765906	-63.921418	237.964912
430	2021-04-04	49.006681	-100.815293	208.166026
431	2021-04-05	28.808199	-126.289107	178.316326
432	2021-04-06	107.801444	-50.314030	257.061117

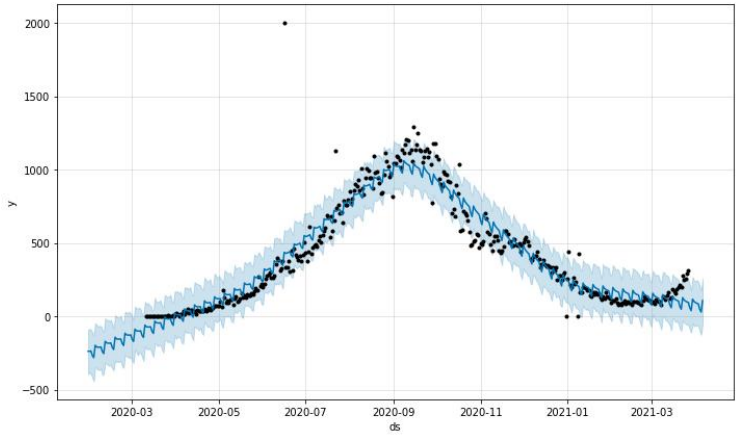

Fig. 3. Predicted value vs Actual value for new death

Fig 3 indicates the relationship between the black dotted line, which specify the predicted value and the solid line referred to as the actual values of the confirmed case of COVID-19 in India. Almost predicted, and the original values run the same as we saw in Fig 3. Similarly, graph of total deaths and total cases matches exactly with Fig. 3.

4.2 Forecasting of COVID-19 Cases Japan with Prophet based Model

From Table 3 on the 2020-11-27, the prediction result for Total cases with covid infection in japan was 1151882.minimum prediction value was 112861 and maximum prediction value 117871.so based on the table above, the number of Total cases is increasing.

From this figure, we can see black scattered line specify the prediction outcome, and the hard blue line indicated the actual value. Both values in an identical track, this model fit well in Fig. 4.

From Table 4 on the 2021-04-06, the prediction result for new cases with covid infection in japan was 1145. Minimum and maximum prediction value was 131 and 2107.

We can see scattered black outlines signposts prediction outcome, and blue hard-line indicates actual value from this figure. Both values in an identical track, this model fit well in Fig. 5.

The Table 5 overhead displays COVID-19 virus Predicting of new deaths in Japan yhat representative the precise prediction, yhat_lower is the smallest forecast and yhat_upper is the maximum forecast. So founded on the table beyond the amount of total death till 2021-04-07 is cumulative to 44.

From this Fig. 6 we can see black scattered line specify predication outcome and blue hard line indicated actual value. Both values in identical track, here we can see some error that's mainly counting error.

Similarly graph of total deaths matches exactly with Fig. 4.

Table 3. Forecasting of total cases

	Date	yhat	yhat_lower	yhat_upper
304	2020-11-21	112066.113963	110863.2784382	113436.276043
305	2020-11-22	112502.313643.	111173.608387	114055.397039
306	2020-11-23.	112901.793776	111298.578982	114585.316030
307	2020-11-24	113413.835491	111713.906782	115464.387527
308	2020-11-25.	112968.037660	112208.006383	116196.723629
3093	2020-11-26.	114580.019943	112487 .260699	117046.205274
310	2020-11-27	115182.474312	1128661.066538	117871.951980

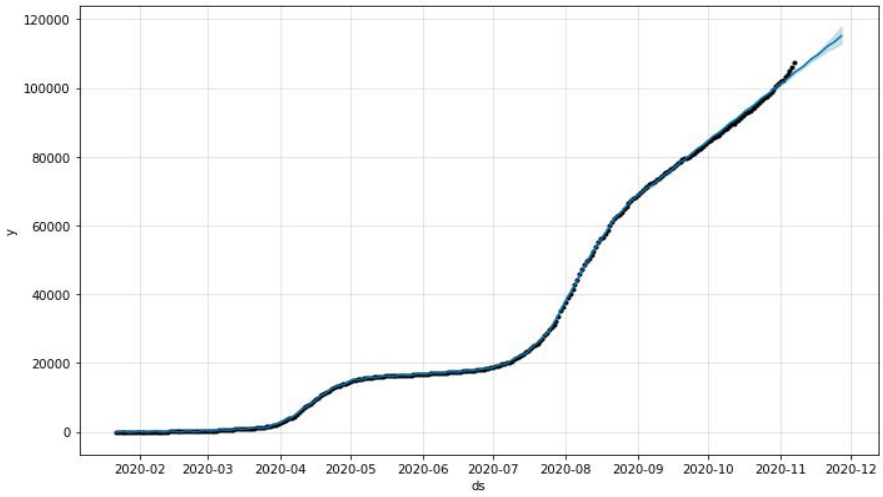

Fig. 4. Predicted value vs Actual value for total cases

Table 4. Forecasting of new cases

	Date	yhat	yhat_lower	yhat_upper
434	2021-03-31	1439.281794	428.180817	2378.757268
435	2021-04-01	1523.823363	535.685250	2614.734557
436	2021-04-02	1447.977863	491.043398	2372.297914
437	2021-04-03	1434.134168	486.040438	2489.417169
438	2021-04-04	1191.198777	226.646797	2167.333333
439	2021-04-05	889.915080	-116.530941	1926.768635
440	2021-04-06	1145.511665	-131.226715	2107.182476

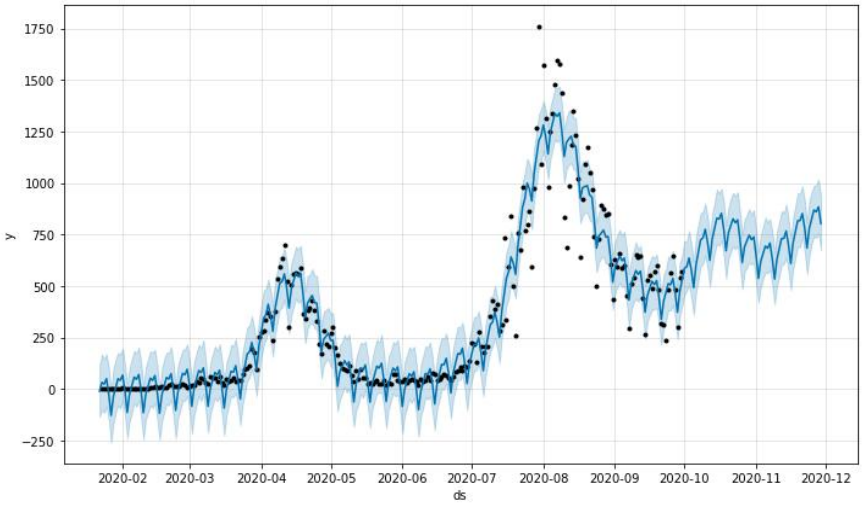

Fig. 5. Predicted value vs actual value for new cases

Table 5. Forecasting of new deaths

	Date	yhat	yhat_lower	yhat_upper
435	2021-04-01	42.938365	23.732355	61.748345
436	2021-04-02	47.903292	26.855199	67.837511
437	2021-04-03	38.385619	18.995403	58.456150
438	2021-04-04	35.289575	16.841006	55.066479
439	2021-04-05	39.321817	19.438198	60.836823
440	2021-04-06	43.854992	24.767389	64.986767
441	2021-04-07	43.581328	21.903581	62.781666

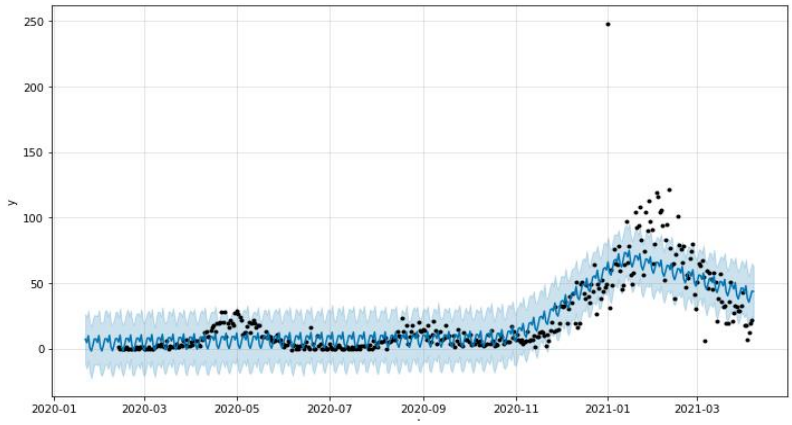

Fig. 6. Predicted value vs. Actual value for new death

5. RESULTS AND DISCUSSION

5.1 Experimental Result for India

For total cases from these two tables, we can see the prediction result and the actual result are matched 98.01%. This model has given good results. On the 17-12-2020, the total number of cases was 9956557 that we got from Table 6 beside the number of Predicted results 10157898 that we get from Table 7. Observing this result, we can assume that the model fits well.

For new cases from these two tables, we can see the prediction result and the actual result are matched by 89.93%. On 06-04-2021, the new cases were 1788 that we got from Table 9 results of Wikipedia, which is subtracted with the result of 29-11-2020 to 28-11-2020 beside for new cases, predicted result was 1988 that we get from Table 8. The actual result matched with the yhat_lower value that indicated minimum prediction result. Perceiving this consequence, we can expect that the model fits quite well.

Similarly, we can see that for total deaths and new deaths, on 06-01-2021, the total number of deaths was 150114 that we got from Table 11 beside the number of Predicted result 167724 that we get from Table 10. It has achieved an accuracy of 89.50%. Again, for new deaths on 06-04-2021, the new death was 446 from Table 13 results of wikipedia, which is subtracted with the result of 06-04-2021 to 05-04-2021. And for the new cases, the predicted outcome was 257 that we get from Table 9. Here we can see it has reached 57.6%. Here, model performance cannot be considered well.

Live Source: https://en.wikipedia.org/wiki/COVID-19_pandemic_in_India

Table 6. Prediction result for total cases

	Date	yhat	yhat_lower	yhat_upper
313	2020-12-08	1.098752e+07	1.072042e+07	1.123218e+07
314	2020-12-09	1.105772e+07	1.076820e+07	1.131163e+07
315	2020-12-10	1.112728e+07	1.083712e+07	1.138160e+07
316	2020-12-11	1.119691e+07	1.089775e+07	1.146167e+07
317	2020-12-12	1.126702e+07	1.096384e+07	1.156753e+07
318	2020-12-13	1.134405e+07	1.102900e+07	1.163638e+07
319	2020-12-14	1.147722e+07	1.106616e+07	1.172711e+07

Table 7. Live covid result from Wikipedia

Date	Deaths	Recoveries	Active cases	#of cases	#of deaths
2020-12-14	143355	9388159	352586	9,884,100(+0.27%)	143,355(+0.23%)
2020-12-15	143709	9422636	339820	9,906,165(+0.22%)	143,709(+0.25%)
2020-12-16	144096	9456449	332002	9,932,547(+0.27%)	144,096(+0.27%)
2020-12-17	144451	9489740	322366	9,956,557(+0.24%)	144,451(+0.25%)

Table 8. Prediction result for new cases

	Date	yhat	yhat_lower	yhat_upper
426	2021-03-31	101.345369	-66.955130	245.077139
427	2021-04-01	93.844757	-65.718594	238.597509
428	2021-04-02	88.521151	-58.640266	245.467072
429	2021-04-03	84.765906	-63.921418	237.964912
430	2021-04-04	49.006681	-100.815293	208.166026
431	2021-04-05	28.808199	-126.289107	178.316326
432	2021-04-06	107.801444	-50.314030	257.061117

Table 9. Live covid result from Wikipedia

Date	Deaths	Recoveries	Active cases	#of cases	#of deaths
2021-04-03	164110	11569241	658909	12,392,260(+0.72%)	164,110(+0.44%)
2021-04-04	164623	11629289	691597	12,485,509(+0.75%)	164,623(+0.31%)
2021-04-05	165101	11682136	741830	12,589,067(+0.83%)	165,101(+0.29%)
2021-04-06	165547	11732279	788223	12,686,049(+0.77%)	165,547(+0.27%)

Table 10. Prediction result for total deaths

	Date	yhat	yhat_lower	yhat_upper
426	2021-03-31	101.345369	-66.955130	245.077139
427	2021-04-01	93.844757	-65.718594	238.597509
428	2021-04-02	88.521151	-58.640266	245.467072
429	2021-04-03	84.765906	-63.921418	237.964912
430	2021-04-04	49.006681	-100.815293	208.166026
431	2021-04-05	28.808199	-126.289107	178.316326
432	2021-04-06	107.801444	-50.314030	257.061117

Table 11. Prediction result for new deaths

	Date	yhat	yhat_lower	yhat_upper
336	2020-12-31	173930.166187	164824.819397	183315.666754
337	2021-01-01	174746.887996	164919.390284	184490.837009
338	2021-01-02	175539.156068	165424.797256	185829.658692
339	2021-01-03	176422.827846	166018.941470	186725.574019
340	2021-01-04	177185.239846	166431.445708	187828.747032
341	2021-01-05	178050.176531	167185.945491	188700.068731
342	2021-01-06	178888.717514	167724.371060	190134.882407

Table 12. Live covid result from for total deaths Wikipedia

Date	Deaths	Recoveries	Active cases	#of cases	#of deaths
2021-01-02	149218	9906387	250183	10,305,788(+0.19%)	149,218(+0.15%)
2021-01-03	149435	9927310	247220	10,323,965(+0.18%)	149,435(+0.15%)
2021-01-04	149649	9946867	243953	10,340,469(+0.16%)	149,649(+0.14%)
2021-01-05	149850	9975958	231036	10,356,844(+0.16%)	149,850(+0.13%)

Table 13. Live Covid result for new deaths from Wikipedia

Date	Deaths	Recoveries	Active cases	#of cases	#of deaths
2021-04-03	164110	11569241	658909	12,392,260(+0.72%)	164,110(+0.44%)
2021-04-04	164623	11629289	691597	12,485,509(+0.75%)	164,623(+0.31%)
2021-04-05	165101	11682136	741830	12,589,067(+0.83%)	165,101(+0.29%)
2021-04-06	165547	11732279	788223	12,686,049(+0.77%)	165,547(+0.27%)

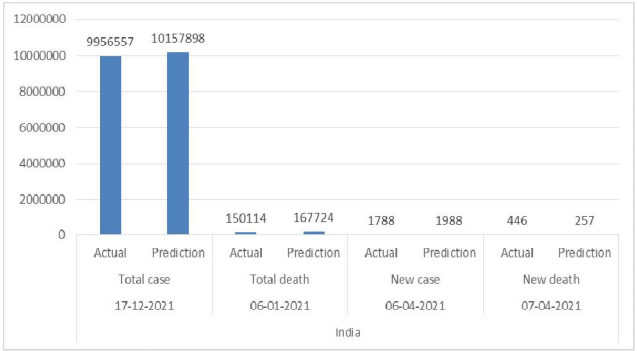

Fig. 7. Comparison between the actual and predicted value of India

Fig. 7 showed the comparison between the actual and predicted value of India by a randomly selected date. This graph indicated that there was no enormous difference between the actual and predicted value. So it can be said that the model that we used was suitable for the prediction of Covid-19.

5.2 Experimental Result for Japan

For total cases from these two tables, we can see the prediction result and the actual result are matched (84.50%). This model has given a very good result. On 27-11-2020, the total number of cases was 139491 that we got from table 15 beside the number of Predicted results 115182 that we obtain from table 14. Observing this result, we can assume that the model fits well.

We can see the predicted result and the actual result match 94.55% for total deaths from these two tables. This model has given good results. On 29-03-2021, the total number of cases was 9061 that we got from Table 17 beside the number of predicted results 9583 that we get from Table 16. Observing this result, we can expect that the model fits too.

For new cases and new deaths, on 06-04-2021, the number of new cases was 2220 that we got from Table 3, which is subtracted with the result of 06-04-2021 to 05-04-2021 beside the number of predicted result 2107 that we get from Table 18.

It achieved 95.99% accuracy beside new deaths on the 07-04-2021 the new Deaths was 30 that we got from Table 20 results of Wikipedia. And for the new deaths, the predicted result was 21 that we get from Table 19. Here we can see it reached 73.33%.

Live result Source**:** https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Japan#Timeline

Table 14. Prediction result for total cases

	Date	yhat	yhat_lower	yhat_upper
304	2020-11-21	112066.113963	110863.278482	113436.276048
305	2020-11-22	112502.313843	111173.608387	114055.397039
306	2020-11-23	112901.793776	111298.578982	114585.316030
307	2020-11-24	113413.835491	111713.906782	115464.387527
308	2020-11-25	113968.037660	112208.006383	116196.723629
309	2020-11-26	114580.019943	112487.260699	117046.205274
310	2020-11-27	115182.474312	112861.086538	117871.951980

Table 15. Live covid result from Wikipedia

Date	Deaths	Recoveries	Active cases	#of cases	#of deaths
2020-11-22	1974	111163	17042	130,179(+2,514)	1,974(+11)
2020-11-23	1981	112269	18108	132,358(+2,179)	1,981(+7)
2020-11-24	1989	113340	18600	133,929(+1,571)	1,989(+8)
2020-11-25	2001	114725	18674	135,400(+1,471)	2,001(+12)
2020-11-26	2022	116378	18861	137,261(+1,861)	2,022(+21)
2020-11-27	2051	118135	19305	139,491(+2,230)	2,051(+29)

Table 16. Prediction result for total deaths

	Date	yhat	yhat_lower	yhat_upper
426	2021-03-23	9303. 664653	9173.547639	9440 588717
427	2021-03-24	9375. 380776	9230.944984	9509 8f 6763
428	2021-03-25	9445. 266719	9295.625063	9560.347772
429	2021-03-26	9519. 857558	9388.010905	9657 078930
430	2021-03-27	9565. 346158	9443.101573	9720 666362
431	2021-03-25	9658. 248266.	9521.536505	9798.694676
432	2021-03-29	9725. 764538	9553 638394	9661.648231

Table 17. Live COVID result from Wikipedia

Date	Deaths	Recoveries	Active cases	#of cases	#of deaths
2021-03-24	8908	436463	13672	459,043(+1,289)	8,908(+47)
2021-03-25	8938	437702	14257	460,897(+1,854)	8,938(+30)
2021-03-26	8967	438879	14994	462,840(+1,943)	8,967(+29)
2021-03-27	8998	440200	15668	464,866(+2,026)	8,998(+31)
2021-03-28	9031	441237	16581	466,849(+1,983)	9,031(+33)
2021-03-29	9061	442369	17187	468,614(+1,765)	9,061(+30)

Table 18. Prediction result for new cases

	Date	yhat	yhat_lower	yhat_upper
434	2021-03-31	1439.281794	428.180817	2378.757268
435	2021-04-01	1523.823363	535.685250	2614.734557
436	2021-04-02	1447.977863	491.043398	2372.297914
437	2021-04-03	1434.134168	486.040438	2489.417169
438	2021-04-04	1191.198777	226.646797	2167.333333
439	2021-04-05	889.915080	-116.530941	1926.768635
440	2021-04-06	1145.511665	131.226715	2107.182476

Table 19. Prediction result for new deaths

	Date	yhat	yhat_lower	yhat_upper
435	2021-04-01	42.936365	23.F732355	61.746345
436	2021-04-02	47.903292	26.855199	67.837511
437	2021-04-03	33.385619	13.995403	58.456150
438	2021-04-04	35.269575	16.841006	55.066479
439	2021-04-05.	39.321817	19.436193	60.3836823
440	2021-04-06	43.854992	24 7E7TSEO	64986767
441	2021-04-07	43.581323	21.903581	62.781666

Table 20. Live COVID result from Wikipedia

Date	Deaths	Recoveries	Active cases	#of cases	#of deaths
2021-04-01	9162	446416	19195	474,773(+2,661)	9,162(+49)
2021-04-02	9185	447515	20558	477,458(+2,685)	9,185(+23)
2021-04-03	9213	449091	21861	480,165(+2,707)	9,213(+28)
2021-04-04	9221	450624	23022	482,867(+2,702)	9,221(+8)
2021-04-05	9231	452155	23939	485,325(+2,458)	9,231(+10)
2021-04-06	9249	454055	24241	487,545(+2,220)	9,249(+18)
2021-04-07	9279	455382	24915	489,576(+2,031)	9,279(+30)

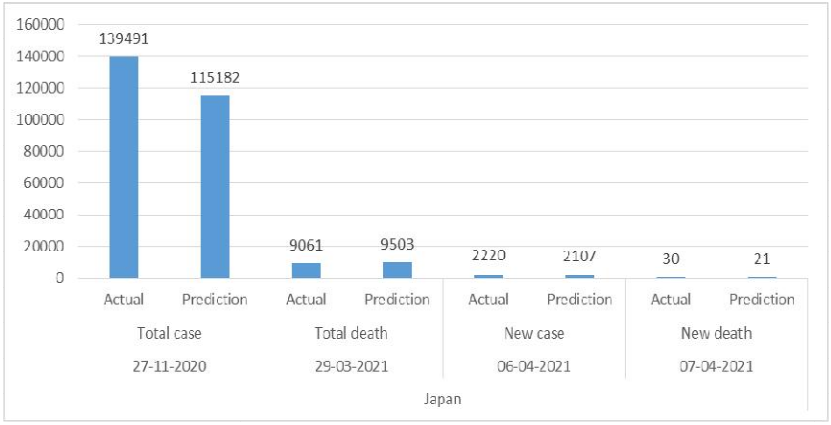

Fig. 8. Comparison between the actual and predicted value of Japan

Fig. 8 showed the comparison between the actual and predicted value of Japan by a randomly selected date. This graph showed that there was no massive difference between the actual and predicted value. So it can be said that the model that we used was appropriate for the prediction of Covid 19.

6. CONCLUSION

This paper presents the forecasting and analysis of new COVID-19 cases. It shows the number of cases, based on the total number of deaths, total cases and new cases of COVID-19, and the case time series based on current information. Although various studies have been published, it have been noticed that there are still limited applications and contributions to the predictions of the series during this war. These are partly due to the limited availability of data about COVID-19. In the case of time series forecasting methods, it is usually necessary to learn computer models and gain a lot of data. This paper provides satisfactory results about the prevalence of COVID-19 for the last 60 days, where graphical analysis is presented using the time-series analysis in case of death.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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Peer-review history:
The peer review history for this paper can be accessed here:
https://www.sdiarticle4.com/review-history/71539