



Covid-19 Analysis & Forecast

May-2020

Process

Step 1

- Total Countries = 185

Step 2

- 1st Cut = Countries above 1000 cases till 12/04/2020
- Confirmed cases = 75

Step 3

- 2nd Cut= Correlation matrix with correlation coefficient above 70%
- Confirmed cases= 25

Step 2

- Principle component Analysis
- Clustering
- 1st cluster 5 countries for time series analysis

Step 3

- Time series analysis
- Forecasting

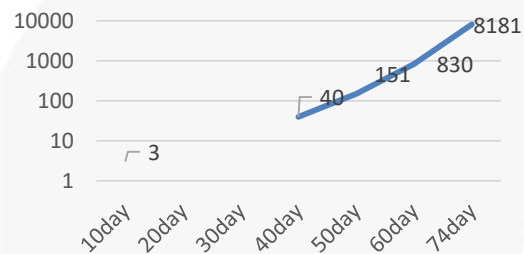
1

Plot of 25 highly correlated countries with India with correlation coefficient above 70%

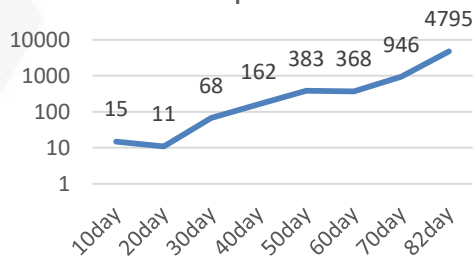
Log Plots

Since 1st confirmed Case

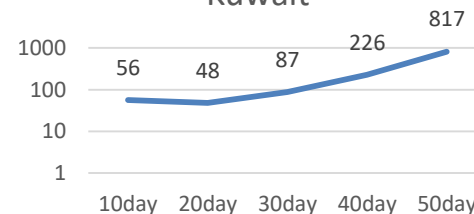
India



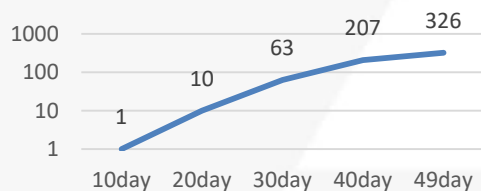
Japan



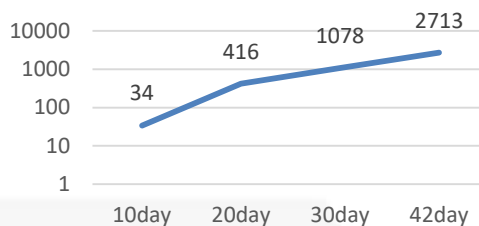
Kuwait



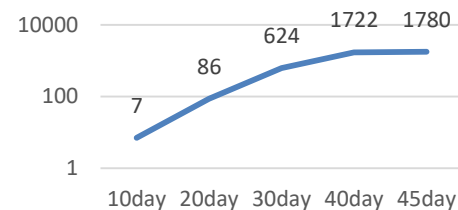
Afganishtan



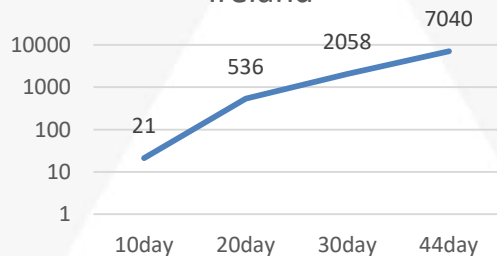
Indonesia



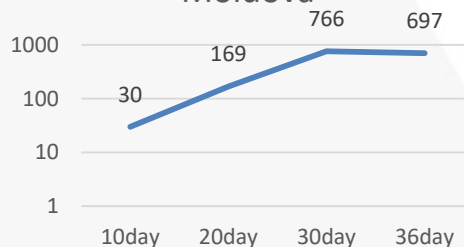
Mexico



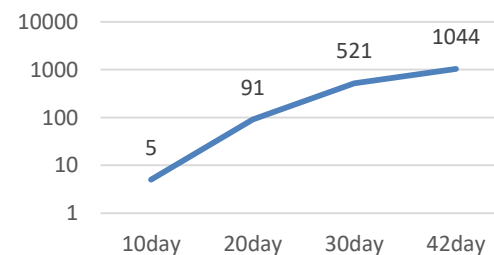
Ireland



Moldova



Morocco



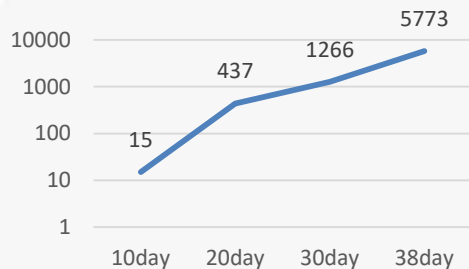
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Plot of 25 highly correlated countries with India with correlation coefficient above 75%

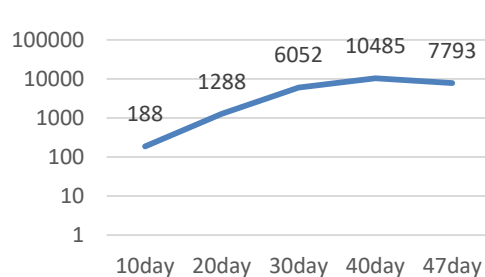
Log Plots

Since 1st confirmed Case

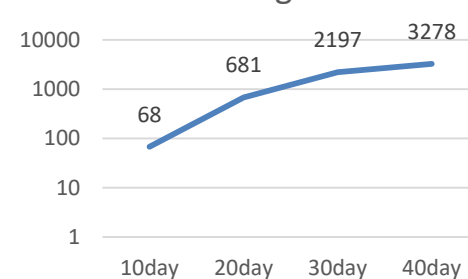
Peru



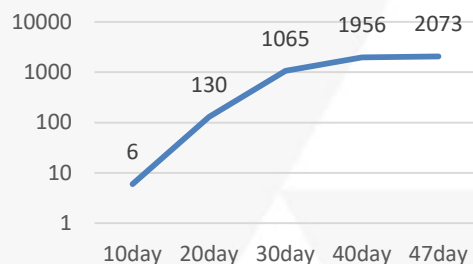
Netherland



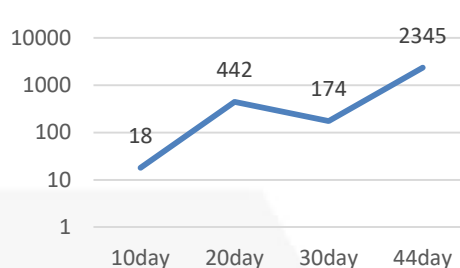
Portugal



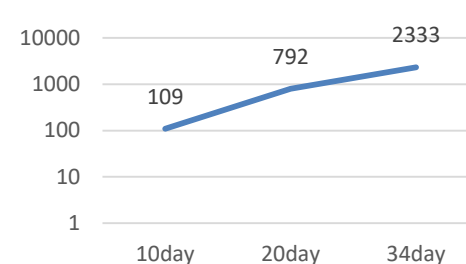
Pakistan



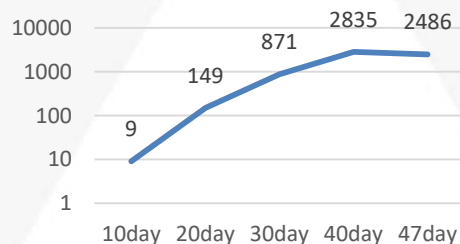
Qatar



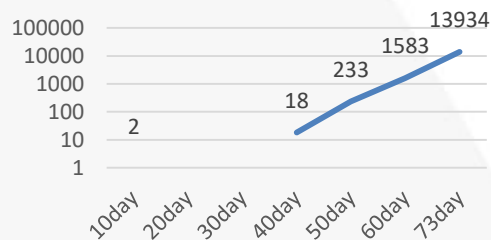
Panama



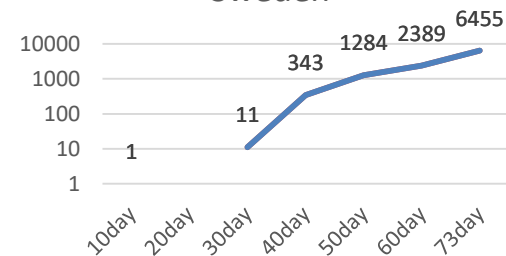
Romania



Russia



Sweden



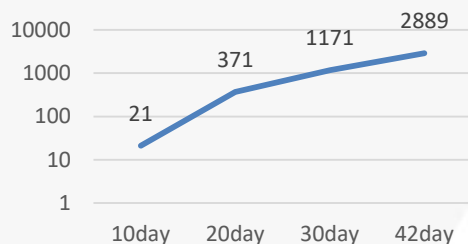
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Plot of 25 highly correlated countries with India with correlation coefficient above 75%

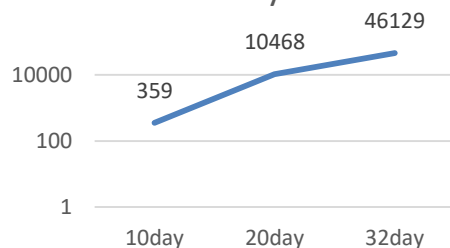
Log Plots

Since 1st confirmed Case

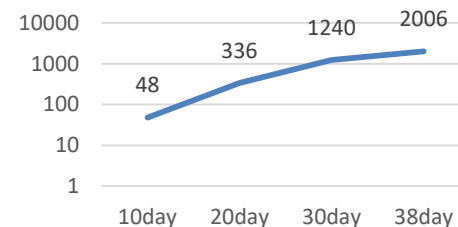
Saudi Arabia



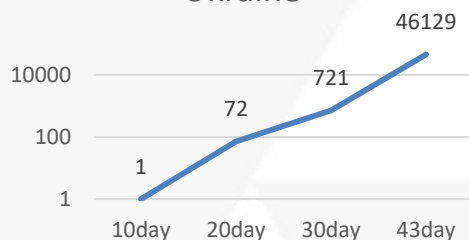
Turkey



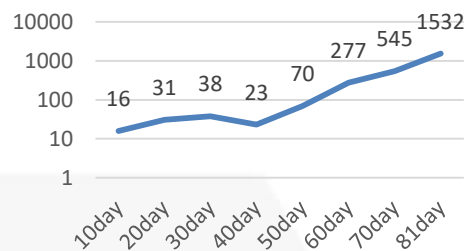
Serbia



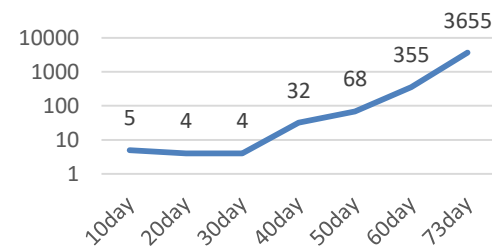
Ukraine



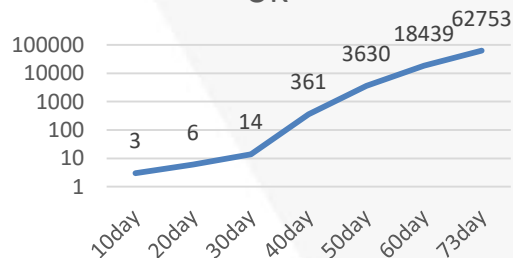
Singapore



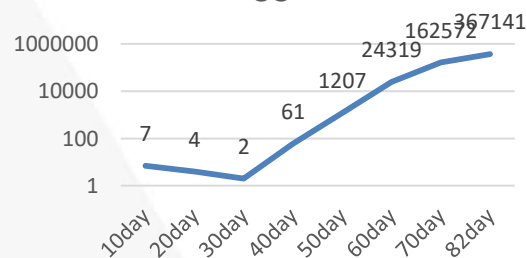
UAE



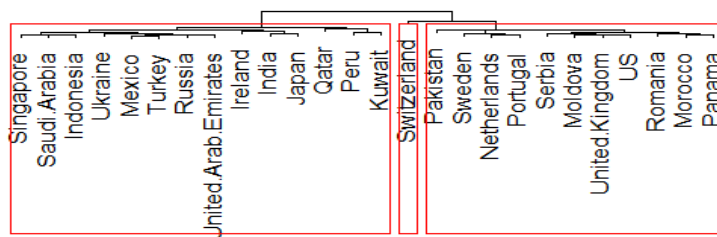
UK



US

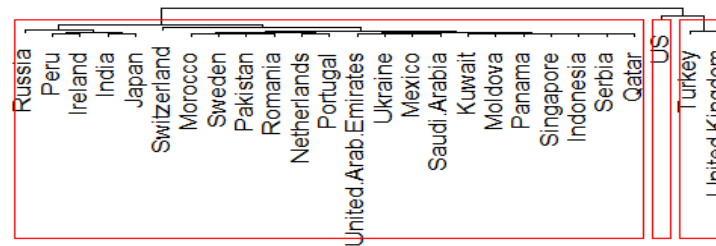


Correlation



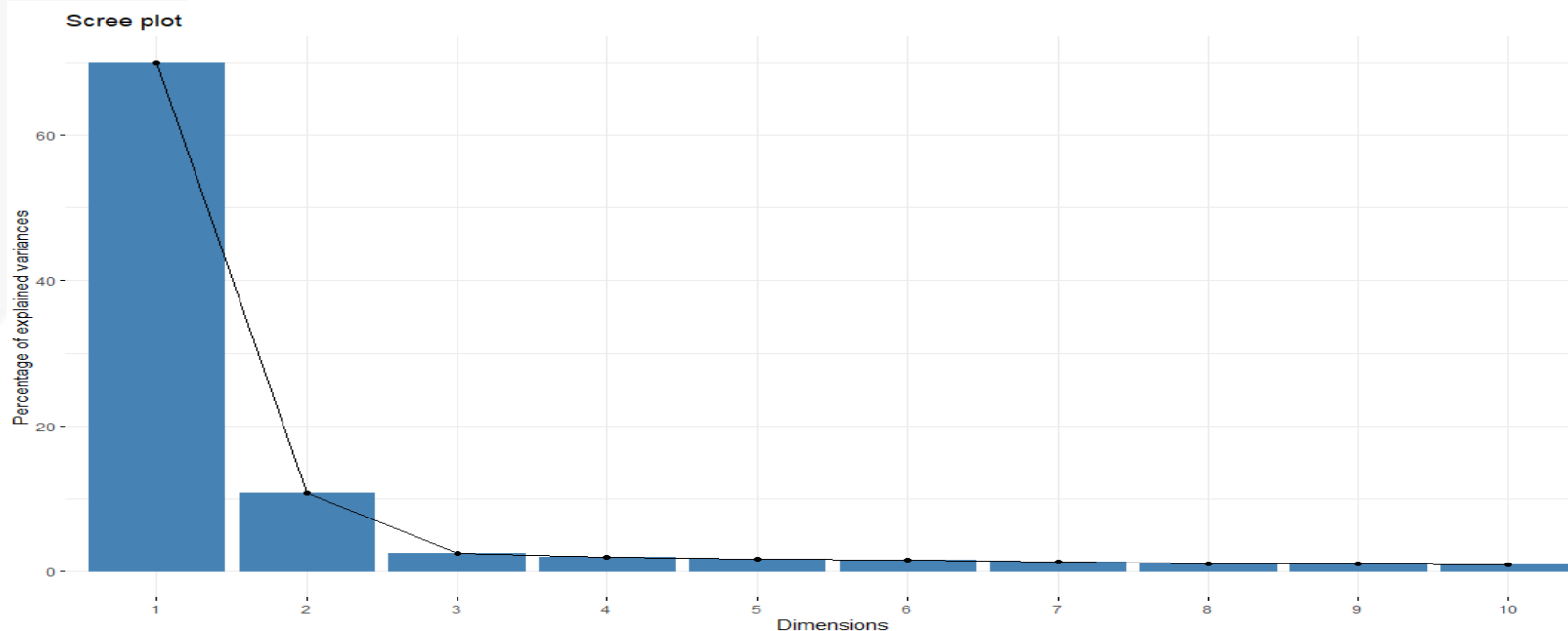
Correlation plot shows 14 highly correlated countries in cluster 1

Comp 1/2



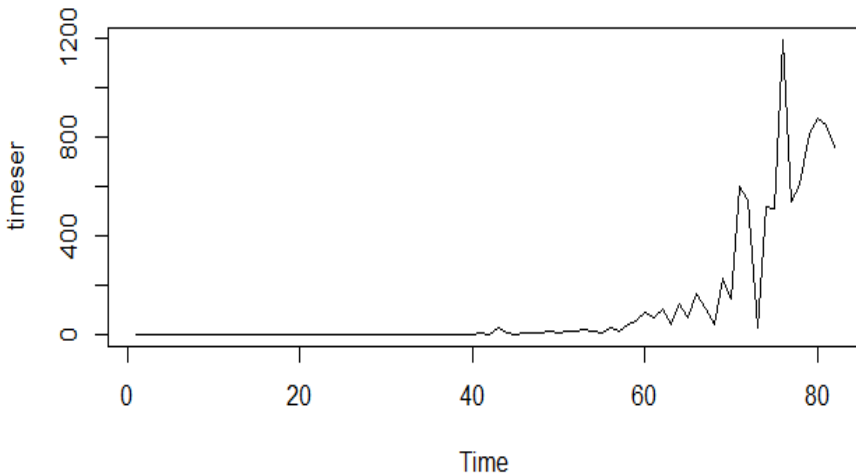
Cluster 1 contains 5 countries – Russia, Peru, Japan, Ireland, India

PCA with 87% variability explained by pc1 and pc2

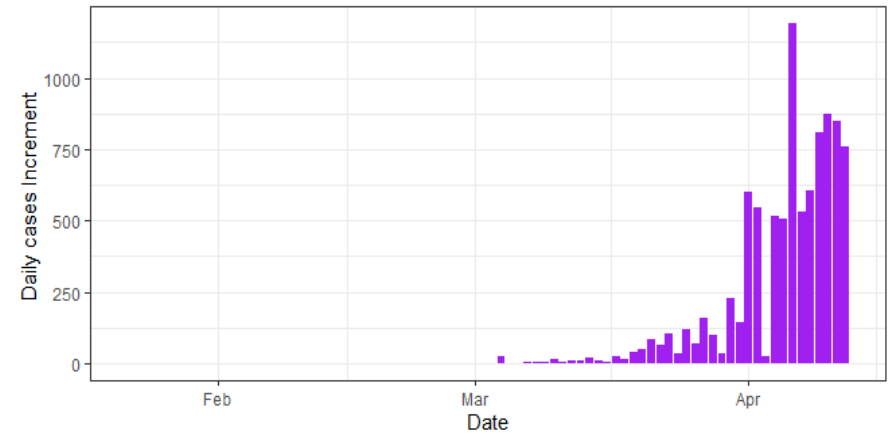


2 Time Series Analysis & Forecasting

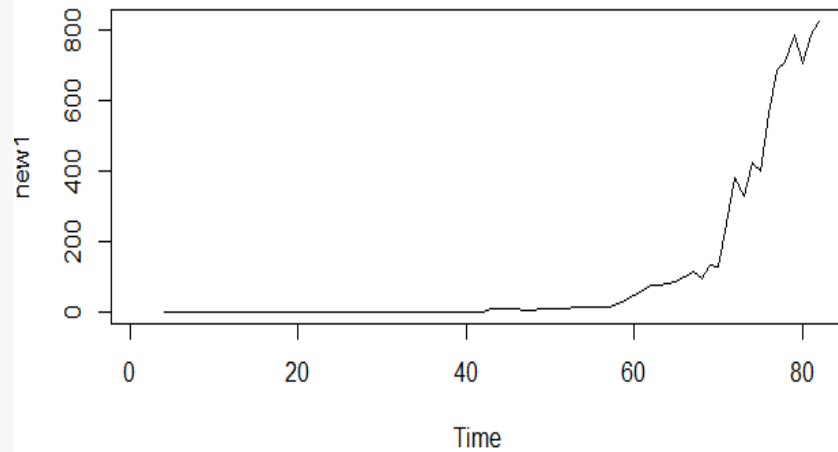
India covid cases time plot



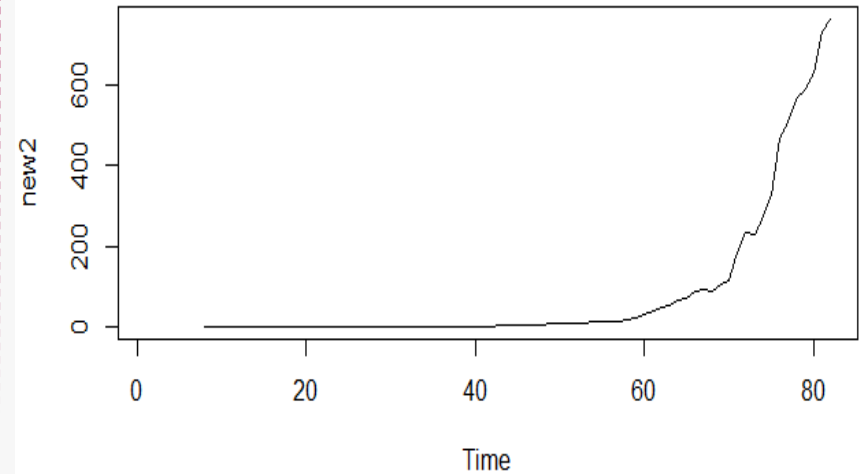
Total daily cases India
2020

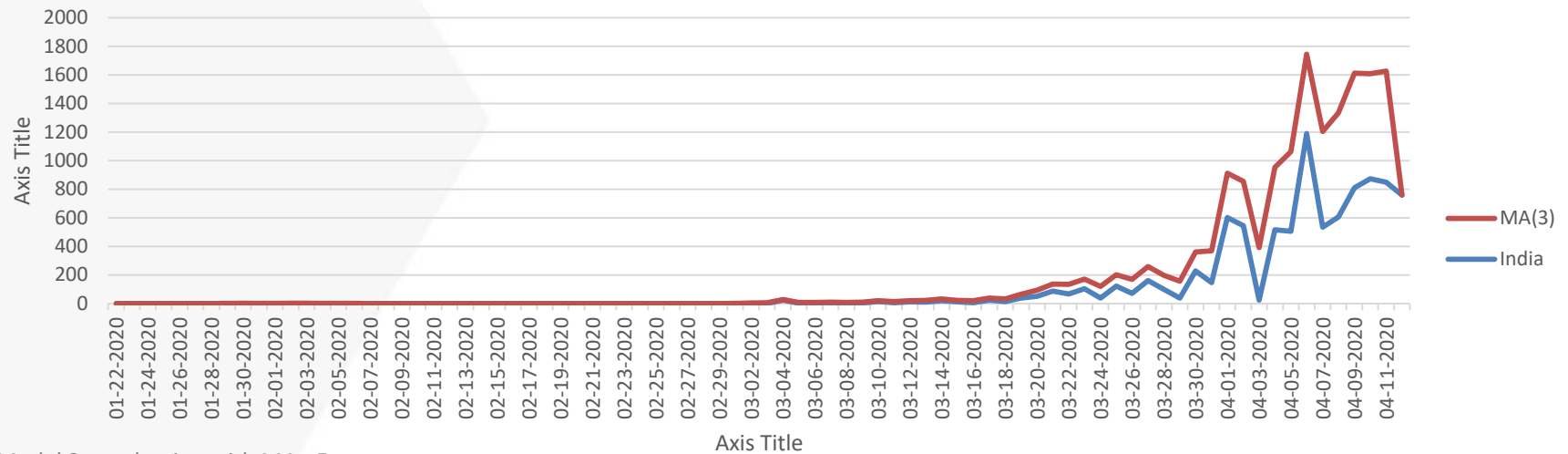


SMA India at MA= 4



SMA India at MA= 5

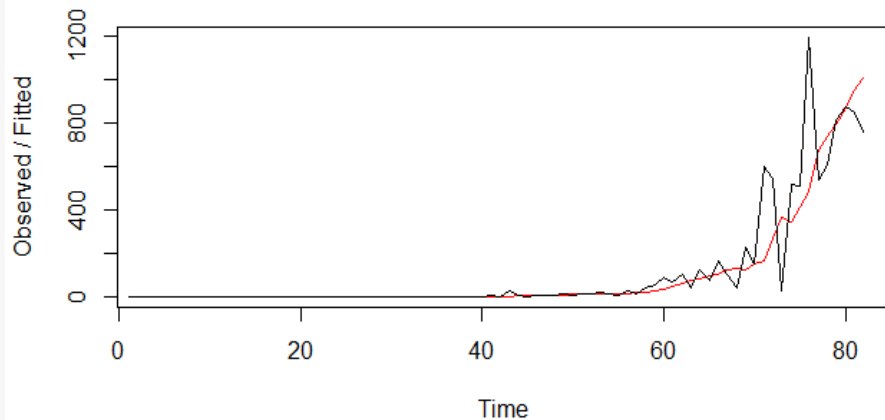




Model Smoothing with MA= 5

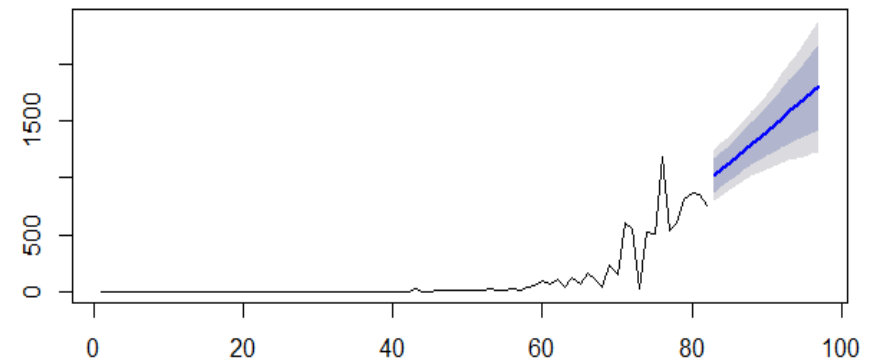
Holt's Exponential Smoothing

Holt-Winters filtering



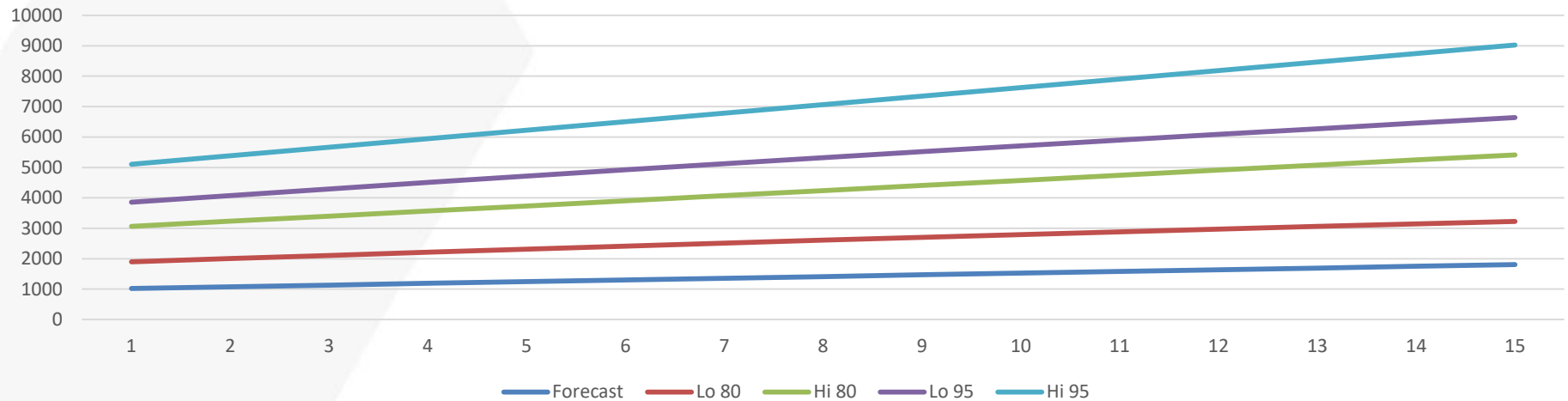
Holt's Exponential Smoothing Forecast

Forecasts from HoltWinters

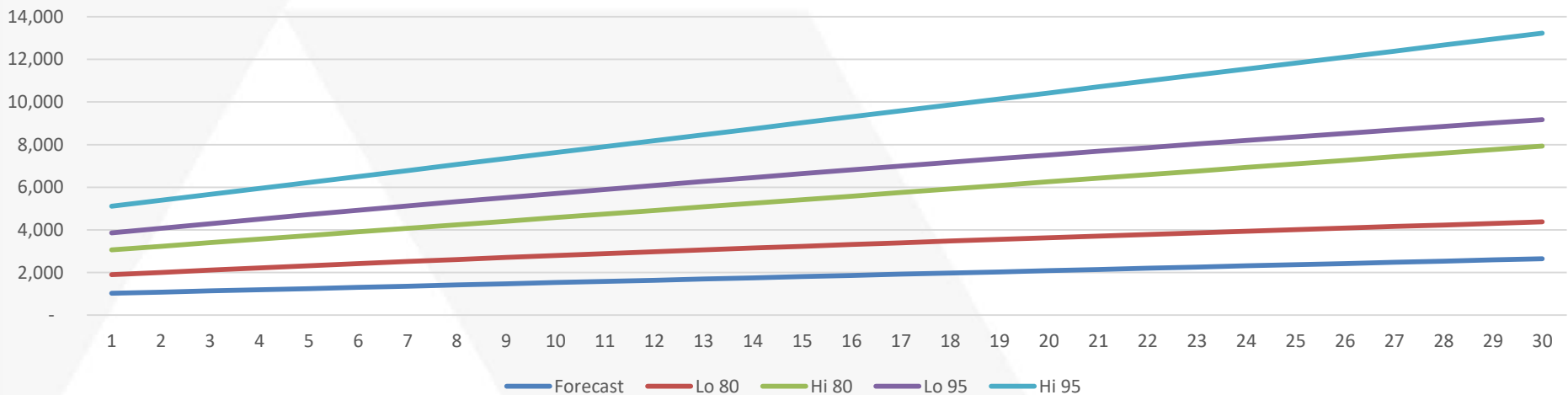


2 Time series Forecast for next 15-30days

Next 15 days Forecast



Next 30 Days Forecast





Thank You