

Forecasting of coronavirus COVID19 epidemic (SIR model)

DISCLAIMER: The model may fail in some situations. In particular, the model may fail in the initial phase and in when additional epidemic stages or outbreaks (not described by SIR model) are encountered. Use it at your own discretion.

Report

```
fprintf('Date: %s\n',datestr(date))
```

Date: 23-Mar-2020

```
aut = fitVirusCV19(@getDataNYState,'prn','on');
```

Epidemic modeling by susceptible-infected-recovered (SIR) model

Country	New York State
Day	19
Estimated the SIR model parameters	
Contact rate (beta)	1.035 (1/day)
Removal rate (gamma)	0.493 (1/day)
Population size (N)	41343
Initial number of cases (I0)	0
Basic reproduction number (R0)	2.101
Final state	
Final number of cases	33996
Final number of susceptibles	7346
Daily forecast for 23-Mar-2020	
Total	19017
Increase	3849
Estimated logistic model parameters	
Epidemic size (K)	28431 (cases)
Epidemic rate (r)	0.542476 (1/day)
Initial doubling time	1.3 (day)
Estimated duration (days)	
Turning day	18
Acceleration phase	4 (days)
Deacceleration phase	5 (days)
Total duration	8 (days)
Estimated datums	
Outbreak	04-Mar-2020
Start of acceleration	18-Mar-2020
Turning point	22-Mar-2020
Start of steady growth	27-Mar-2020
Start of ending phase	04-Apr-2020
Statistics	
Number of observations	19
Degrees of freedom	15
Root Mean Squared Error	414.606
R-Squared	0.992
Adjusted R-Squared	0.99
F-statistics vs. zero model	647.707
p-value	4.37718e-16

Method

Total cases weight	0.5
Infection rate weight	0.5
Objective function value	1924.48
Exit condition (1=OK)	0

