

# Esmating Covid-19 Rt

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This is a self-learning project from the following tutorial on datacamp: <https://www.datacamp.com/community/tutorials/replicating-in-r-covid19>

## Bettencourt & Ribeiro

### Modeling arrivals

Using Poisson Distribution to model the ‘arrival’ process of infections. Let  $\lambda$  be the average rate of infections per day, then the probability of  $k$  new cases on a day is given by

$$P(k|\lambda) = \frac{\lambda^k e^{-\lambda}}{k!}$$

### Code setup

```
library(tidyverse)

## Warning: package 'tidyverse' was built under R version 3.4.2
## -- Attaching packages ----- tidyverse 1.2.1 --
## v ggplot2 3.1.1      v purrr   0.3.2
## v tibble  2.1.1      v dplyr  0.8.0.1
## v tidyr   0.8.0      v stringr 1.2.0
## v readr   1.1.1      v forcats 0.4.0

## Warning: package 'tibble' was built under R version 3.4.4
## Warning: package 'tidyr' was built under R version 3.4.3
## Warning: package 'purrr' was built under R version 3.4.4
## Warning: package 'dplyr' was built under R version 3.4.4
## Warning: package 'forcats' was built under R version 3.4.4

## -- Conflicts ----- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()     masks stats::lag()
```



#### References:

<http://systrom.com/blog/the-metric-we-need-to-manage-covid-19/>  
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0002185>