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REAL-TIME DATA ANALYTICS AND PREDICTION OF THE COVID-19 PANDEMIC¹

(PERIOD TO MARCH 28TH, 2020)

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Abstract

This brief paper is versioned 3 in a series of short papers that describe a set of descriptive and predictive analytics of the pandemic COVID-19 around the world. We exceptionally propose this new and uncommon way of publications because of the current emergency circumstances where Data are gathered and analyzed directly day by day. Because of the new behavior regarding the spread speed and the contagion features of this virus, we opted by comparative analytics based on demographic characteristics in localities and countries for prediction, without using historical data in epidemiology. The test proofs of our findings are done day by day with the real figures reported from the Data. To feed our models in algorithms, we refer to the reported cases from the Data of the World Health Organization (WHO). Because of the current circumstances of emergency, this paper is brief and will be succeeded with a series of versions until the end of the pandemic. The full paper will be published afterward with more details about the functions, the model, and the variables included in our algorithms.

Model of Relative Contagion Factor (RCF)

Our predictive algorithm discovers a correlative coefficient that affects directly the epidemic curve in countries. We name this coefficient “the Relative Contagion Factor (RCF)” as a function of the following parameters:

- The population density in countries or localities (pDensity),
- The containment effort in the country or locality (cEffort),
- The incubation period, averaged to 12 (iPeriod).

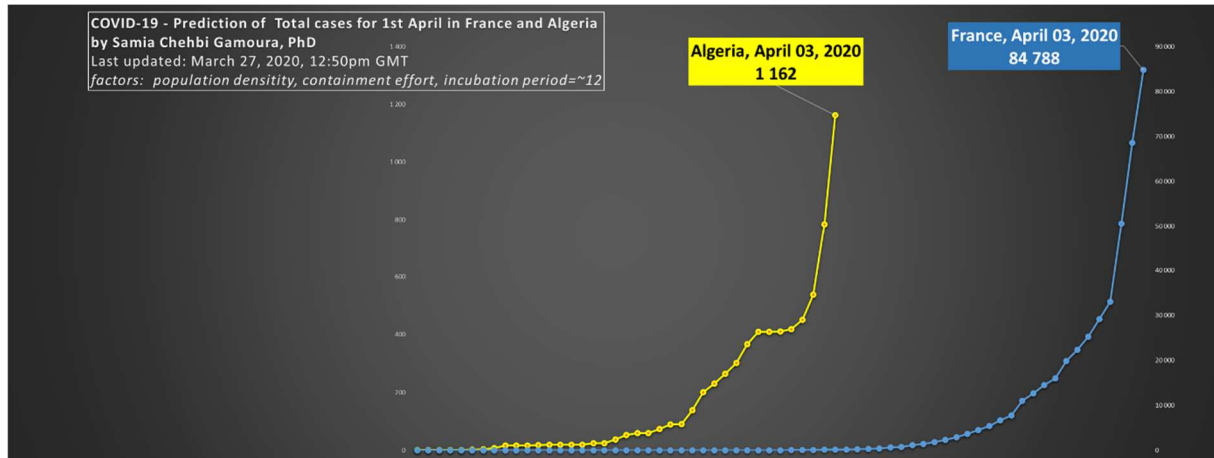
$$\text{Relative Contagion Factor} = f(\text{pDensity}, \text{cEffort}, \text{iPeriod})$$

Our algorithm computes this factor automatically from the Dataset that is changing every day. The factor is adapted day by day depending on the progress of the Dataset.

This factor is different from the contagion coefficient “RO” widely used in epidemiology.

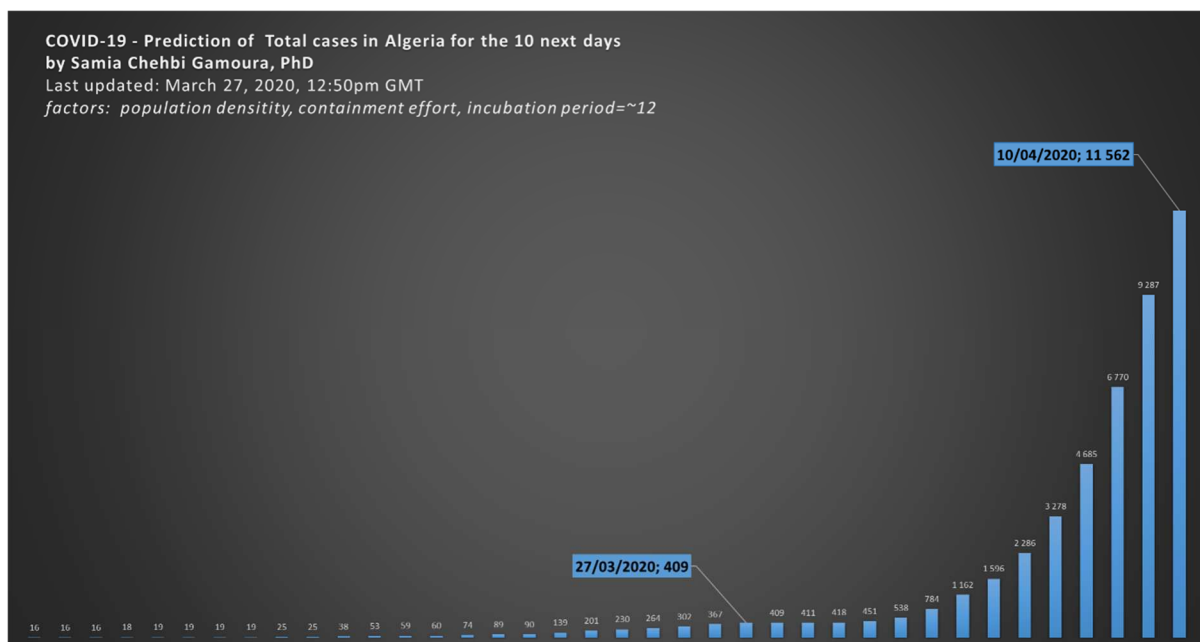
¹ Date of publication : March 26, 2020

Findings 1: Prediction of total cases in Algeria and France for the next week (April 03rd, 2020)



In applying on actual total cases of yesterday March 27th, the algorithm predicts 1 162 total cases for Algeria and 84 788 in France next week on the day April 03rd, 2020. Even, France with this huge number starts slowing as starting the peak epidemic period.

Findings 2: Prediction of total cases in Algeria for the next 10 days (April 10th, 2020)



In applying on actual total cases of yesterday March 27th in Algeria, the algorithm predicts achieving a total cases of 11 562 within 10 days (on April 10th, 2020).