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

(PERIOD TO APRIL 2ND, 2020)

SAMIA CHEHBI GAMOURA

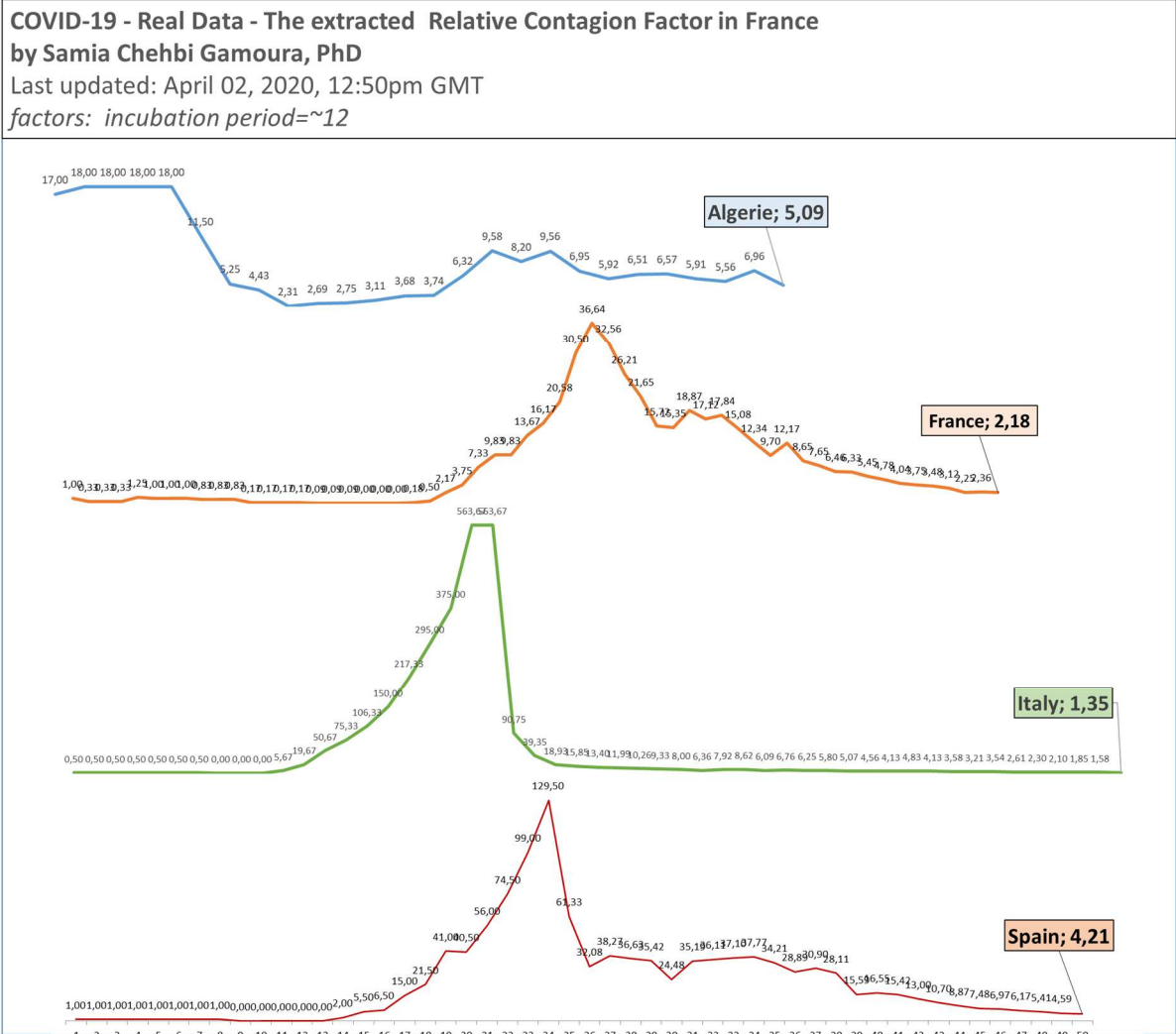
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Abstract

This brief paper is versioned 4 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.

Findings 1: Prediction of epidemic peak by extracting the Relative Contagion Factor in real Dataset of France, Italy, Spain, and Algeria



These charts represent the real Relative Contagion Factor (RCF) computed by our algorithm in four countries: France, Italy, Spain, and Algeria. The Dataset in these charts is updated to yesterday 1 April 2020.

In the algorithm, a peak of epidemic in a country is interpreted by a value of RCF less than 2 (< 2.00). It means one infected person did not infect others in the period of the recent incubation period last days (averaged by the algorithm to ~ 12).

The increase or decrease in the RCF value depends directly on the containment effort in the country.

Besides, we observed the following: If we suppose that the containment effort in the country is respected, the value of RCF decreases -1.00 every ten days.

Deduction and prediction of the peak date from the charts to today April 2, 2020:

- In France, the last value of RCF is 2.18 of yesterday April 1st, 2020 (more than 1). This means France is not yet in the peak of the epidemic cycle. The algorithm predicts France will get the peak within two more days (on 03 or 04 April, 2020).

Prediction of RCF in France		
01/04/2020	2,18	
02/04/2020	2,08	Today
03/04/2020	1,98	Peak

- In Italy, the last value of RCF is 1.35 of yesterday April 1st, 2020 (less than 1). This means Italy is inside the peak of the epidemic cycle. The algorithm discovered Italy reached the peak on March 30, 2020.

Prediction of RCF in Italy		
29/03/2020	2,10	
30/03/2020	1,85	Peak
31/03/2020	1,58	Peak
01/04/2020	1,35	Peak (today)

- In Spain, the last value of RCF is 4.21 of yesterday April 1st, 2020 (more than 1). This means Spain is far from the peak of the epidemic cycle. The algorithm predicts Spain will get the peak on April 24, 2020.

Prediction of RCF in Spain		
01/04/2020	4,21	
02/04/2020	4,11	Today
03/04/2020	4,01	
04/04/2020	3,91	
05/04/2020	3,81	
06/04/2020	3,71	
07/04/2020	3,61	
08/04/2020	3,51	
09/04/2020	3,41	
10/04/2020	3,31	
11/04/2020	3,21	
12/04/2020	3,11	
13/04/2020	3,01	
14/04/2020	2,91	
15/04/2020	2,81	
16/04/2020	2,71	
17/04/2020	2,61	
18/04/2020	2,51	
19/04/2020	2,41	
20/04/2020	2,31	
21/04/2020	2,21	
22/04/2020	2,11	
23/04/2020	2,01	
24/04/2020	1,91	Peak

- In Algeria, the last value of RCF is 5.09 of yesterday April 1st, 2020 (more than 1). This means Algeria is far from the peak of the epidemic cycle. The algorithm predicts Algeria will get the peak on May 2, 2020.

Prediction of RCF in Algeria		
01/04/2020	5,09	
02/04/2020	4,99	Today
03/04/2020	4,89	
04/04/2020	4,79	
05/04/2020	4,69	
06/04/2020	4,59	
07/04/2020	4,49	
08/04/2020	4,39	
09/04/2020	4,29	
10/04/2020	4,19	
11/04/2020	4,09	
12/04/2020	3,99	
13/04/2020	3,89	
14/04/2020	3,79	
15/04/2020	3,69	
16/04/2020	3,59	
17/04/2020	3,49	
18/04/2020	3,39	
19/04/2020	3,29	
20/04/2020	3,19	
21/04/2020	3,09	
22/04/2020	2,99	
23/04/2020	2,89	
24/04/2020	2,79	
25/04/2020	2,69	
26/04/2020	2,59	
27/04/2020	2,49	
28/04/2020	2,39	
29/04/2020	2,29	
30/04/2020	2,19	
01/05/2020	2,09	
02/05/2020	1,99	Peak