When will Brazil overtake other countries in numbers
of confirmed cases and deaths in this pandemic?

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Abstract – We calculated when Brazil, which today it is in the eighth position in the ranking of confirmed cases, but has the highest growth rate of this disease among the first 11 countries, will overtake the USA, today in first place in the ranking of confirmed cases and deaths by COVID-19. We did the same with the other 6 countries.

Keywords – Brazil, coronavirus, COVID-19, pandemic.

Yesterday, Mother's Day, saddened me to know that so many mothers were away from their children, to know that there are so many deaths because of this pandemic, to realize that Europe, the cradle of Western culture, is a continent with its population in decline, with more deaths than births, perhaps causing their own euthanasia, something like a loss of vitality.

Today is no different. Mothers, fathers, sons and daughters, family and friends who often need to keep their distance and live longing for loved ones, in addition to having all the difficulties to work and survive.

In this unpretentious and naive article, with data from *Wikipedia* about the pandemic of COVID-19, we calculated when Brazil, which today it is in the eighth position in the ranking of confirmed cases, but has the highest growth rate of this disease among the first 11 countries, will overtake the USA, today in first place in the ranking of confirmed cases and deaths by COVID-19. We did the same with the other 6 countries. This disease started in China and today it seems to be completely stable and controlled there. Ranking (table 1) given by the Johns Hopkins University in this morning (May 11, 2020).

For this calculation we will adopt the basic hypothesis that both the number of confirmed cases and the number of deaths by COVID-19 obey different geometric progressions, the ratio of which will be calculated by the average of the growth percentages given in tables 2 to 9, each for a specific country, countries that currently occupy the first 8 positions in the

ranking of the number of confirmed cases of the disease. Data extracted from *Wikipedia* in May 11, 2020.

Over time, we will be admitting that these ratios remain constant, without being influenced by any other factor and no birth or other deaths will be taken into account.

The final results are shown in table 10. A more accurate estimate will be given in the next article. Fortunately we can see that the growth rates have been decreasing in the last few days, most likely due to greater control of social distance, hygiene practice and the use of medications.

Ranking	Country	Confirmed Cases
1	US	1,329,799
2	Spain	224,350
3	Russia	221,344
4	United Kingdom	220,449
5	Italy	219,070
6	France	177,094
7	Germany	171,879
8	Brazil	162,699
9	Turkey	138,657
10	Iran	107,603
11	China	84,010

Table 1 – Number of confirmed cases by COVID-19 for 11 firsts classifications. Date: May 11, 2020. Time 6:32:34 AM.

Date (DD/MM/YYYY)	# of cases	# of deaths
25/04/2020	933,698 (+3.9%)	47,916 (+4.0%)
26/04/2020	960,582 (+2.9%)	49,077 (+2.4%)
27/04/2020	982,668 (+2.3%)	50,314 (+2.5%)
28/04/2020	1,007,097 (+2.5%)	52,518 (+4.4%)
29/04/2020	1,033,001 (+2.6%)	55,054 (+4.8%)
30/04/2020	1,062,675 (+2.9%)	57,137 (+3.8%)
01/05/2020	1,095,682 (+3.1%)	58,931 (+3.1%)
02/05/2020	1,126,250 (+2.8%)	60,599 (+2.8%)
03/05/2020	1,151,643 (+2.3%)	61,716 (+1.8%)
04/05/2020	1,172,921 (+1.8%)	62,593 (+1.4%)
05/05/2020	1,195,173 (+1.9%)	65,028 (+3.9%)
06/05/2020	1,220,032 (+2.1%)	67,729 (+4.2%)
07/05/2020	1,247,567 (+2.2%)	69,700 (+2.9%)
08/05/2020	1,274,681 (+2.2%)	71,395 (+2.4%)
09/05/2020	1,300,243 (+2.0%)	72,950 (+2.2%)
10/05/2020	1,320,621 (+1.6%)	73,891 (+1.3%)

Table 2 – Confirmed cases and deaths by COVID-19
in the United States of America.
Source: https://en.wikipedia.org/wiki/COVID-19_pandemic_in_the_United_States

Date (DD/MM/YYYY)	# of cases	# of deaths
25/04/2020	228,610 (+1.2%)	23,190 (+1.3%)
26/04/2020	231,236 (+1.1%)	23,521 (+1.4%)
27/04/2020	234,156 (+1.3%)	23,822 (+1.3%)
28/04/2020	237,615 (+1.5%)	24,275 (+1.9%)
29/04/2020	240,743 (+1.3%)	24,543 (+1.1%)
30/04/2020	243,991 (+1.3%)	24,824 (+1.1%)
01/05/2020	246,449 (+1.0%)	25,100 (+1.1%)
02/05/2020	248,028 (+0.64%)	25,264 (+0.65%)
03/05/2020	249,120 (+0.44%)	25,428 (+0.65%)
04/05/2020	251,081 (+0.79%)	25,613 (+0.73%)
05/05/2020	254,050 (+1.2%)	25,857 (+0.95%)
06/05/2020	256,855 (+1.1%)	26,070 (+0.82%)
07/05/2020	260,117 (+1.3%)	26,299 (+0.88%)
08/05/2020	262,783 (+1.0%)	26,478 (+0.68%)
09/05/2020	264,670 (+0.72%)	26,621 (+0.54%)
10/05/2020	268,143 (+1.3%)	26,744 (+0.46%)

Table 3 – Confirmed cases and deaths by COVID-19 in Spain.
Source: https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Spain

Date (DD/MM/YYYY)	# of cases	# of deaths
25/04/2020	74,588 (+8.7%)	681 (+11%)
26/04/2020	80,949 (+8.5%)	747 (+9.7%)
27/04/2020	87,147 (+7.7%)	794 (+6.3%)
28/04/2020	93,558 (+7.4%)	867 (+9.2%)
29/04/2020	99,399 (+6.2%)	972 (+12%)
30/04/2020	106,498 (+7.1%)	1,073 (+10%)
01/05/2020	114,431 (+7.4%)	1,165 (+8.6%)
02/05/2020	124,054 (+8.4%)	1,222 (+4.9%)
03/05/2020	134,687 (+8.6%)	1,280 (+4.7%)
04/05/2020	145,268 (+7.9%)	1,356 (+5.9%)
05/05/2020	155,370 (+7%)	1,451 (+7%)
06/05/2020	165,929 (+6.8%)	1,537 (+5.9%)
07/05/2020	177,160 (+6.8%)	1,625 (+5.7%)
08/05/2020	187,859 (+6%)	1,723 (+6%)
09/05/2020	198,676 (+5.8%)	1,827 (+6%)
10/05/2020	209,688 (+5.5%)	1,915 (+4.8%)

Table 4 – Confirmed cases and deaths by COVID-19 in Russia.
Source: https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Russia

Date (DD/MM/YYYY)	Cases (% rise)	Deaths (% rise)
25/04/2020	148,377 (3.4%)	24,055 (1.8%)
26/04/2020	152,840 (3.0%)	24,393 (1.4%)
27/04/2020	157,149 (2.8%)	25,302 (3.7%)
28/04/2020	161,145 (2.5%)	26,097 (3.1%)
29/04/2020	165,221 (2.5%)	26,771 (2.6%)
30/04/2020	171,253 (3.7%)	27,510 (2.8%)
01/05/2020	177,454 (3.6%)	28,131 (2.3%)
02/05/2020	182,260 (2.7%)	28,446 (1.1%)
03/05/2020	186,599 (2.4%)	28,734 (1.0%)
04/05/2020	190,584 (2.1%)	29,427 (2.4%)
05/05/2020	194,990 (2.3%)	30,076 (2.2%)
06/05/2020	201,101 (3.1%)	30,615 (1.8%)
07/05/2020	206,715 (2.8%)	31,241 (2.0%)
08/05/2020	211,364 (2.2%)	31,587 (1.1%)
09/05/2020	215,260 (1.8%)	31,855 (0.8%)
10/05/2020	219,183 (1.8%)	32,065 (0.7%)

Table 5 – Confirmed cases and deaths by COVID-19
in the United Kingdom.
Source: https://en.wikipedia.org/wiki/COVID-19_pandemic_in_the_United_Kingdom

Date (DD/MM/YYYY)	# of cases	# of deaths
25/04/2020	195,351 (+1.2%)	26,384 (+1.6%)
26/04/2020	197,675 (+1.2%)	26,644 (+1.0%)
27/04/2020	199,414 (+0.88%)	26,977 (+1.2%)
28/04/2020	201,505 (+1.0%)	27,359 (+1.4%)
29/04/2020	203,591 (+1.0%)	27,682 (+1.2%)
30/04/2020	205,463 (+0.92%)	27,967 (+1.0%)
01/05/2020	207,428 (+0.96%)	28,236 (+0.96%)
02/05/2020	209,328 (+0.92%)	28,710 (+1.7%)
03/05/2020	210,717 (+0.66%)	28,884 (+0.61%)
04/05/2020	211,938 (+0.58%)	29,079 (+0.68%)
05/05/2020	213,013 (+0.51%)	29,315 (+0.81%)
06/05/2020	214,457 (+0.68%)	29,684 (+1.3%)
07/05/2020	215,858 (+0.65%)	29,958 (+0.92%)
08/05/2020	217,185 (+0.61%)	30,201 (+0.81%)
09/05/2020	218,268 (+0.50%)	30,395 (+0.64%)
10/05/2020	219,814 (+0.34%)	30,739 (+0.59%)

Table 6 – Confirmed cases and deaths by COVID-19 in Italy.
Source: https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Italy

Date (DD/MM/YYYY)	# of cases	# of deaths
25/04/2020	124,114 (+1.3%)	22,614 (+1.7%)
26/04/2020	124,575 (+0.37%)	22,856 (+1.1%)
27/04/2020	125,770 (+1.0%)	23,293 (+1.9%)
28/04/2020	126,835 (+0.85%)	23,660 (+1.6%)
29/04/2020	128,442 (+1.3%)	24,087 (+1.8%)
30/04/2020	129,581 (+0.89%)	24,376 (+1.2%)
01/05/2020	130,185 (+0.47%)	24,594 (+0.89%)
02/05/2020	130,979 (+0.61%)	24,760 (+0.67%)
03/05/2020	131,287 (+0.24%)	24,895 (+0.55%)
04/05/2020	131,863 (+0.44%)	25,201 (+1.2%)
05/05/2020	132,967 (+0.84%)	25,531 (+1.3%)
06/05/2020	137,150 (+3.14%)	25,809 (+1.1%)
07/05/2020	137,779 (+0.46%)	25,987 (+0.69%)
08/05/2020	138,421 (+0.47%)	26,230 (+0.94%)
09/05/2020	138,854 (+0.31%)	26,310 (+0.30%)
10/05/2020	139,063 (+0.15%)	26,380 (+0.27%)

Table 7 – Confirmed cases and deaths by COVID-19 in France.
Source: https://en.wikipedia.org/wiki/COVID-19_pandemic_in_France

Date (DD/MM/YYYY)	# of cases	# of deaths
25/04/2020	152,438 (+1.37%)	5,500 (+3.4%)
26/04/2020	154,175 (+1.14%)	5,640 (+2.6%)
27/04/2020	155,193 (+0.66%)	5,750 (+2.0%)
28/04/2020	156,337 (+0.74%)	5,913 (+2.8%)
29/04/2020	157,641 (+0.83%)	6,115 (+3.4%)
30/04/2020	159,119 (+0.94%)	6,288 (+2.8%)
01/05/2020	160,758 (+1.03%)	6,481 (+3.1%)
02/05/2020	161,703 (+0.59%)	6,575 (+1.5%)
03/05/2020	162,496 (+0.49%)	6,649 (+1.1%)
04/05/2020	163,175 (+0.42%)	6,692 (+0.65%)
05/05/2020	163,860 (+0.42%)	6,831 (+2.1%)
06/05/2020	164,807 (+0.58%)	6,996 (+2.4%)
07/05/2020	166,091 (+0.78%)	7,119 (+1.8%)
08/05/2020	167,300 (+0.73%)	7,266 (+2.1%)
09/05/2020	168,551 (+0.75%)	7,369 (+1.4%)
10/05/2020	169,218 (+0.40%)	7,395 (+0.35%)

Table 8 – Confirmed cases and deaths by COVID-19 in Germany.
Source: https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Germany

Date (DD/MM/YYYY)	# of cases	# of deaths
25/04/2020	58,509 (+10.4%)	4,016 (+9.4%)
26/04/2020	61,888 (+5.8%)	4,205 (+4.7%)
27/04/2020	66,501 (+7.5%)	4,543 (+8.0%)
28/04/2020	71,886 (+8.1%)	5,017 (+10.4%)
29/04/2020	78,162 (+8.7%)	5,466 (+8.9%)
30/04/2020	85,380 (+9.2%)	5,901 (+8.0%)
01/05/2020	91,589 (+7.3%)	6,329 (+7.3%)
02/05/2020	96,559 (+5.4%)	6,750 (+6.7%)
03/05/2020	101,147 (+4.8%)	7,025 (+4.1%)
04/05/2020	107,780 (+6.6%)	7,321 (+4.2%)
05/05/2020	114,715 (+6.4%)	7,921 (+8.2%)
06/05/2020	125,218 (+9.2%)	8,536 (+7.8%)
07/05/2020	135,106 (+7.9%)	9,146 (+7.1%)
08/05/2020	145,328 (+7.6%)	9,897 (+8.2%)
09/05/2020	155,939 (+7.3%)	10,627 (+7.4%)
10/05/2020	162,699 (+4.3%)	11,123 (+4.7%)

Table 9 – Confirmed cases and deaths by COVID-19 in Brazil.
Source: https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Brazil

Ranking	Country	Confirmed Cases	Average Growth % in 16 days	Days for overtake	Deaths	Average Growth % in 16 days	Days for overtake
1	US	1,329,799	2.44	47	79,528	2.99	50
2	Spain	224,350	1.07	6	26,383	0.97	15
3	Russia	221,344	7.24	826	2,009	7.36	0
4	United Kingdom	220,449	2.67	8	31,930	1.93	22
5	Italy	219,070	0.79	6	30,560	1.03	18
6	France	177,094	0.80	2	26,383	1.08	16
7	Germany	171,879	0.74	2	7,569	2.09	0
8	Brazil	162,699	7.28	0	11,123	7.19	0

Table 10 – Number of days for that Brazil overtake other countries in COVID-19 pandemic.
Date $t = 0$: May 11, 2020.

Links of internet, all accessed in May 11, 2020:

1. https://en.wikipedia.org/wiki/Portal:Coronavirus_disease_2019

2. https://en.wikipedia.org/wiki/COVID-19_pandemic_in_the_United_States

3. https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Spain

4. https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Italy

5. https://en.wikipedia.org/wiki/COVID-19_pandemic_in_the_United_Kingdom

6. https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Russia

7. https://en.wikipedia.org/wiki/COVID-19_pandemic_in_France

8. https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Germany

9. https://en.wikipedia.org/wiki/COVID-19_pandemic_in_Brazil

10. https://gisanddata.maps.arcgis.com/apps/opsdashboard/index.html#/bda7594740fd40299423467b48e9ecf6