When will Brazil overtake other countries in numbers of confirmed cases and deaths in this pandemic?
Valdir Monteiro dos Santos Godoi
(valdir.msgodoi@gmail.com)

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.

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

Table 1 – Number of confirmed cases by COVID-19 for 11 firsts classifications. Date: May 11, 2020. Time 6:32:34 AM.
## 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](https://en.wikipedia.org/wiki/COVID-19_pandemic_in_the_United_States)

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

## Table 3 – Confirmed cases and deaths by COVID-19 in Spain.


<table>
<thead>
<tr>
<th>Date (DD/MM/YYYY)</th>
<th># of cases</th>
<th># of deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>25/04/2020</td>
<td>228,610 (+1.2%)</td>
<td>23,190 (+1.3%)</td>
</tr>
<tr>
<td>26/04/2020</td>
<td>231,236 (+1.1%)</td>
<td>23,521 (+1.4%)</td>
</tr>
<tr>
<td>27/04/2020</td>
<td>234,156 (+1.3%)</td>
<td>23,822 (+1.3%)</td>
</tr>
<tr>
<td>28/04/2020</td>
<td>237,615 (+1.5%)</td>
<td>24,275 (+1.9%)</td>
</tr>
<tr>
<td>29/04/2020</td>
<td>240,743 (+1.3%)</td>
<td>24,543 (+1.1%)</td>
</tr>
<tr>
<td>30/04/2020</td>
<td>243,991 (+1.3%)</td>
<td>24,824 (+1.1%)</td>
</tr>
<tr>
<td>01/05/2020</td>
<td>246,449 (+1.0%)</td>
<td>25,100 (+1.1%)</td>
</tr>
<tr>
<td>02/05/2020</td>
<td>248,028 (+0.64%)</td>
<td>25,264 (+0.65%)</td>
</tr>
<tr>
<td>03/05/2020</td>
<td>249,120 (+0.44%)</td>
<td>25,428 (+0.65%)</td>
</tr>
<tr>
<td>04/05/2020</td>
<td>251,081 (+0.79%)</td>
<td>25,613 (+0.73%)</td>
</tr>
<tr>
<td>05/05/2020</td>
<td>254,050 (+1.2%)</td>
<td>25,857 (+0.95%)</td>
</tr>
<tr>
<td>06/05/2020</td>
<td>256,855 (+1.1%)</td>
<td>26,070 (+0.82%)</td>
</tr>
<tr>
<td>07/05/2020</td>
<td>260,117 (+1.3%)</td>
<td>26,299 (+0.88%)</td>
</tr>
<tr>
<td>08/05/2020</td>
<td>262,783 (+1.0%)</td>
<td>26,478 (+0.68%)</td>
</tr>
<tr>
<td>09/05/2020</td>
<td>264,670 (+0.72%)</td>
<td>26,621 (+0.54%)</td>
</tr>
<tr>
<td>10/05/2020</td>
<td>268,143 (+1.3%)</td>
<td>26,744 (+0.46%)</td>
</tr>
</tbody>
</table>
### Table 4 – Confirmed cases and deaths by COVID-19 in Russia.


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

### Table 5 – Confirmed cases and deaths by COVID-19 in the United Kingdom.


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

Date | # of cases | # of deaths |
---|---|---|
25/04/2020 | 124,114 (+1.3%) | 22,614 (+1.7%) |
26/04/2020 | 124,575 (+0.37%) | 22,884 (+0.61%) |
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.
<table>
<thead>
<tr>
<th>Date</th>
<th># of cases</th>
<th># of deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>25/04/2020</td>
<td>152,438 (+1.37%)</td>
<td>5,500 (+3.4%)</td>
</tr>
<tr>
<td>26/04/2020</td>
<td>154,175 (+1.14%)</td>
<td>5,640 (+2.6%)</td>
</tr>
<tr>
<td>27/04/2020</td>
<td>155,193 (+0.66%)</td>
<td>5,750 (+2.0%)</td>
</tr>
<tr>
<td>28/04/2020</td>
<td>156,337 (+0.74%)</td>
<td>5,913 (+2.8%)</td>
</tr>
<tr>
<td>29/04/2020</td>
<td>157,641 (+0.83%)</td>
<td>6,115 (+3.4%)</td>
</tr>
<tr>
<td>30/04/2020</td>
<td>159,119 (+0.94%)</td>
<td>6,288 (+2.8%)</td>
</tr>
<tr>
<td>01/05/2020</td>
<td>160,758 (+1.03%)</td>
<td>6,481 (+3.1%)</td>
</tr>
<tr>
<td>02/05/2020</td>
<td>161,703 (+0.59%)</td>
<td>6,575 (+1.5%)</td>
</tr>
<tr>
<td>03/05/2020</td>
<td>162,496 (+0.49%)</td>
<td>6,649 (+1.1%)</td>
</tr>
<tr>
<td>04/05/2020</td>
<td>163,175 (+0.42%)</td>
<td>6,692 (+0.65%)</td>
</tr>
<tr>
<td>05/05/2020</td>
<td>163,860 (+0.42%)</td>
<td>6,831 (+2.1%)</td>
</tr>
<tr>
<td>06/05/2020</td>
<td>164,807 (+0.58%)</td>
<td>6,996 (+2.4%)</td>
</tr>
<tr>
<td>07/05/2020</td>
<td>166,091 (+0.78%)</td>
<td>7,119 (+1.8%)</td>
</tr>
<tr>
<td>08/05/2020</td>
<td>167,300 (+0.73%)</td>
<td>7,266 (+2.1%)</td>
</tr>
<tr>
<td>09/05/2020</td>
<td>168,551 (+0.75%)</td>
<td>7,369 (+1.4%)</td>
</tr>
<tr>
<td>10/05/2020</td>
<td>169,218 (+0.40%)</td>
<td>7,395 (+0.35%)</td>
</tr>
</tbody>
</table>

Table 8 – Confirmed cases and deaths by COVID-19 in Germany.

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

Table 9 – Confirmed cases and deaths by COVID-19 in Brazil.
<table>
<thead>
<tr>
<th>Ranking</th>
<th>Country</th>
<th>Confirmed Cases</th>
<th>Average Growth % in 16 days</th>
<th>Days for overtake</th>
<th>Deaths</th>
<th>Average Growth % in 16 days</th>
<th>Days for overtake</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>US</td>
<td>1,329,799</td>
<td>2.44</td>
<td>47</td>
<td>79,528</td>
<td>2.99</td>
<td>50</td>
</tr>
<tr>
<td>2</td>
<td>Spain</td>
<td>224,350</td>
<td>1.07</td>
<td>6</td>
<td>26,383</td>
<td>0.97</td>
<td>15</td>
</tr>
<tr>
<td>3</td>
<td>Russia</td>
<td>221,344</td>
<td>7.24</td>
<td>826</td>
<td>2,009</td>
<td>7.36</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>United Kingdom</td>
<td>220,449</td>
<td>2.67</td>
<td>8</td>
<td>31,930</td>
<td>1.93</td>
<td>22</td>
</tr>
<tr>
<td>5</td>
<td>Italy</td>
<td>219,070</td>
<td>0.79</td>
<td>6</td>
<td>30,560</td>
<td>1.03</td>
<td>18</td>
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<tr>
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<td>France</td>
<td>177,094</td>
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<td>2</td>
<td>26,383</td>
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<td>16</td>
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<td>Germany</td>
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<td>2</td>
<td>7,569</td>
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<tr>
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<td>Brazil</td>
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<td>0</td>
<td>11,123</td>
<td>7.19</td>
<td>0</td>
</tr>
</tbody>
</table>

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

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