Global trend: [2]

This will be my last Newsletter – and this is basically why:

The global death toll continues to fall, and is currently at less than a quarter of the peak value in February this year.
I think this is as good place to end my reporting as any!

If I extrapolate the excess-death study figures published in The Lancet [1] to today’s date, then over 20 million have died because of the COVID-19 pandemic (cf. the worldometer figure of 6.25 million).

National trends (selected countries)
As we have seen from The Lancet report [1], the reporting of COVID-19 deaths in Europe & the Americas has been far more reliable than that in Asia & Africa – and with very little dispersion between them:
So, this comparison of national death rates since the beginning of the year can be trusted:
Death rates are now falling everywhere, except in UK, Germany, Italy & France.

Normalized daily death rates (7-day moving mean) for the last 30 days. What I have done here is normalize the data to the initial data point at the beginning of the 30-day period.
The UK death rate stands out having doubled during the past month (again).
Death rates have been fairly constant for a middle group of countries: FR, IT, BE, PT & DE.
While in the bottom group of countries – NL, US, PE, BR & MX – death rates have dropped below half the rate at the beginning of the period.

Tendencies: Comparison of doubling times [4]

<table>
<thead>
<tr>
<th>Country</th>
<th>1st death</th>
<th>E/R Ratio</th>
<th>Doubling time (7-day fits)</th>
<th>23 Apr</th>
<th>16 Apr</th>
<th>09 Apr</th>
<th>02 Apr</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT</td>
<td>21 Feb 20</td>
<td>1.88</td>
<td></td>
<td>691 days</td>
<td>707 days</td>
<td>741 days</td>
<td>718 days</td>
</tr>
<tr>
<td>FR</td>
<td>15 Feb 20</td>
<td>1.25</td>
<td></td>
<td>626 days</td>
<td>701 days</td>
<td>805 days</td>
<td>713 days</td>
</tr>
<tr>
<td>ES</td>
<td>03 Mar 20</td>
<td>1.64</td>
<td></td>
<td>1136 days</td>
<td>1702 days</td>
<td>760 days</td>
<td>2496 days</td>
</tr>
<tr>
<td>US</td>
<td>29 Feb 20</td>
<td>1.33</td>
<td></td>
<td>1999 days</td>
<td>1861 days</td>
<td>1320 days</td>
<td>1185 days</td>
</tr>
<tr>
<td>UK</td>
<td>05 Mar 20</td>
<td>1.13</td>
<td></td>
<td>330 days</td>
<td>570 days</td>
<td>422 days</td>
<td>556 days</td>
</tr>
<tr>
<td>NL</td>
<td>06 Mar 20</td>
<td>2.13</td>
<td></td>
<td>1681 days</td>
<td>1198 days</td>
<td>1140 days</td>
<td>779 days</td>
</tr>
<tr>
<td>DE</td>
<td>09 Mar 20</td>
<td>1.80</td>
<td></td>
<td>405 days</td>
<td>492 days</td>
<td>292 days</td>
<td>322 days</td>
</tr>
<tr>
<td>BE</td>
<td>11 Mar 20</td>
<td>1.16</td>
<td></td>
<td>1101 days</td>
<td>790 days</td>
<td>720 days</td>
<td>935 days</td>
</tr>
<tr>
<td>BR</td>
<td>17 Mar 20</td>
<td>1.28</td>
<td></td>
<td>3871 days</td>
<td>3672 days</td>
<td>2537 days</td>
<td>1976 days</td>
</tr>
<tr>
<td>PT</td>
<td>16 Mar 20</td>
<td>2.13</td>
<td></td>
<td>773 days</td>
<td>797 days</td>
<td>687 days</td>
<td>709 days</td>
</tr>
<tr>
<td>IN</td>
<td>12 Mar 20</td>
<td>8.44</td>
<td></td>
<td>9479 days</td>
<td>32249 days</td>
<td>6807 days</td>
<td>7257 days</td>
</tr>
<tr>
<td>MX</td>
<td>19 Mar 20</td>
<td>2.67</td>
<td></td>
<td>9810 days</td>
<td>6272 days</td>
<td>3326 days</td>
<td>3307 days</td>
</tr>
</tbody>
</table>

- Deterioration for most European countries: UK, DE, FR, IT & PT.
- Worst case is now UK.
This is how doubling times have been evolving since the beginning of the year:

(Log y scale. Remember: Shorter doubling times equate to a faster evolution of the disease.)

UK & DE notably worst!

**EU Case-rate Comparisons** [5]
The dispersion in E/R ratios for the countries shown here is sufficiently small that this graph remains indicative of the comparative progress of COVID-19 in each country. (Especially since this is a log plot.)
Per-capita rates now falling virtually everywhere.

**Vaccinations against COVID-19** [6]
65.1% of the world population has received at least one dose of a vaccine. (65% last week)
11.52 billon doses have been administered globally. (11.45 billion last week)
11.52 million are now administered daily. (11.45 billion last week)
Only 15.2% of people in low-income countries have received at least one dose. (same as last week)
No changes in ranking.
No changes in ranking.

**US States’ Trends** [7]

**Warning**: Reporting by the different states has become increasingly erratic in the past month or so. The states with the most reliable reports are NJ, NY & PA; the worst are FL, AZ & TN. Daily death rates (7-day moving mean) for the last 30 days (FL, AZ & TN excluded):
Tendencies: Comparison doubling times [4]

Double digits, triple+shortening, triple, quadruple

<table>
<thead>
<tr>
<th>State</th>
<th>1st death</th>
<th>E/R Ratio</th>
<th>23 Apr</th>
<th>16 Apr</th>
<th>09 Apr</th>
<th>02 Apr</th>
</tr>
</thead>
<tbody>
<tr>
<td>AZ</td>
<td>20 Mar 20</td>
<td>1.31</td>
<td>1299 days</td>
<td>1013 days</td>
<td>348 days</td>
<td>368 days</td>
</tr>
<tr>
<td>CA</td>
<td>04 Mar 20</td>
<td>1.46</td>
<td>1299 days</td>
<td>1310 days</td>
<td>1266 days</td>
<td>915 days</td>
</tr>
<tr>
<td>GA</td>
<td>14 Mar 20</td>
<td>1.41</td>
<td>874 days</td>
<td>873 days</td>
<td>605 days</td>
<td>527 days</td>
</tr>
<tr>
<td>IL</td>
<td>17 Mar 20</td>
<td>1.40</td>
<td>3220 days</td>
<td>2821 days</td>
<td>1549 days</td>
<td>1390 days</td>
</tr>
<tr>
<td>MA</td>
<td>20 Mar 20</td>
<td>0.74</td>
<td>1416 days</td>
<td>2690 days</td>
<td>2406 days</td>
<td>1693 days</td>
</tr>
<tr>
<td>MI</td>
<td>18 Mar 20</td>
<td>1.15</td>
<td>2234 days</td>
<td>2069 days</td>
<td>1770 days</td>
<td>839 days</td>
</tr>
<tr>
<td>NJ</td>
<td>10 Mar 20</td>
<td>1.20</td>
<td>3900 days</td>
<td>3350 days</td>
<td>2542 days</td>
<td>4271 days</td>
</tr>
<tr>
<td>NY</td>
<td>14 Mar 20</td>
<td>1.30</td>
<td>3221 days</td>
<td>3387 days</td>
<td>5407 days</td>
<td>5828 days</td>
</tr>
<tr>
<td>OH</td>
<td>18 Mar 20</td>
<td>1.60</td>
<td>1987 days</td>
<td>1766 days</td>
<td>1468 days</td>
<td>743 days</td>
</tr>
<tr>
<td>PA</td>
<td>18 Mar 20</td>
<td>1.14</td>
<td>1743 days</td>
<td>2935 days</td>
<td>1621 days</td>
<td>1678 days</td>
</tr>
<tr>
<td>TN</td>
<td>22 Mar 20</td>
<td>1.28</td>
<td>1204 days</td>
<td>1204 days</td>
<td>244 days</td>
<td>1169 days</td>
</tr>
<tr>
<td>TX</td>
<td>16 Mar 20</td>
<td>1.50</td>
<td>1893 days</td>
<td>2673 days</td>
<td>1846 days</td>
<td>1325 days</td>
</tr>
</tbody>
</table>

Improvement everywhere and all states now green except GA.

This is how doubling times have been evolving since the beginning of the year:
(Log plot! – Remember, longer doubling times are preferable.)
General improvement is marked.

**New York Area update** [8]
Death rates since the beginning of the year are well down and staying down:
Today’s images: Earlier this week, Jo & I spent a couple of days in General de Gaulle’s home town: Colombey les Deux Églises

The house where he lived with his family is surprisingly, even touchingly, modest & simple.
Bought in 1934, it was the only home he ever owned.

He died there of an aneurysm on 3rd November 1970, while playing patience at his card table.
Despite the General’s express wishes, the Pompidou government raised a huge Cross of Lorraine as a memorial to him on the hillside overlooking the village:

There’s also an extensive museum beneath the cross dedicated to the General’s life & works.

Charkes de Gaulle is buried in a simple grave in the local cemetery, alongside his daughter, Anne (1928-1948), and his wife, Yvonne (1900-1979):
The inscription on his tomb reads (at his insistence) just this: Charles de Gaulle 1890-1970. The funeral was a local & family affair, no one outside that circle was permitted to attend the ceremony, except a number of compagnons de la libération.

Thanks!
In closing, I’d like to thank all those who have written to me with feedback, input & encouragement during this two-year-long endeavour, especially: Angela, Barbara, Bob, Desmond, Eleanor, Eddy, Giovanni, Hazel, Jane, Jeannie, Jerry, John H, Ladan, Laurence, Lynda, Marlowe, Paul, Russell, Shannon, Sue, Susan, Terry, Tony & Trevor.

Keep well & keep safe!
The statistics on COVID-19 mortality that I have been presenting in these newsletters are data that are based on individual deaths reported as they occur by various government agencies (reports that are analysed, validated and aggregated by worldometer). For a variety of reasons, mortality statistics collected in this way may not provide accurate figures of true COVID-19 mortality:

- Different countries use different definitions of what constitutes a COVID-19 death.
- The collection of mortality statistics may be incomplete in a country.
- Some countries may intentionally under report COVID-19 deaths for their own purposes.
- Simple errors such as oversights and typing errors may give misleading results.
- And so on... reliability of the statistics varies greatly between locations and over time.

An alternative way to estimate a potentially more accurate estimate of true COVID-19 mortality is to compare the total number of deaths during the pandemic (deaths from whatever cause) with the total number of deaths during a period prior to the pandemic: excess mortality.

On March 10th just such a study was published in The Lancet: Estimating excess mortality due to the COVID-19 pandemic: a systematic analysis of COVID-19-related mortality, 2020-21

This extremely authoritative study was the work of 96 authors from 36 institutions scattered throughout the world.

Many thanks to Bob for bringing this to my attention!

The only other study on this scale was one performed under the aegis of The Economist magazine: Tracking COVID-19 excess deaths across countries

Both studies agree remarkably well.

The national COVID-19 data are taken from the worldometer website which reproduces the data collected from Official Websites of Ministries of Health of other Governmental Institutions and Government authorities’ social media accounts.

- Different countries use different criteria in recording COVID-19 deaths, often distinguishing between probable and confirmed cause of death.
• Belgium appears to have the loosest criterion attributing any death to COVID-19 if there is any suspicion that COVID-19 could have been the cause.
• The UK definition: death occurring within 28 days of a positive test for COVID-19. (If the patient dies 29 days after the test, it wasn’t officially caused by COVID-19.)
• China has only reported 3 COVID-19 deaths since 17th May 2020! One occurred on 14th January 2021. This week (19th March) there were 2 more.

- Some countries, notably the US, regularly update the entire set of historical data provided to the website.

[3] Note on line graphs: The key on the right of all line graphs in this newsletter lists the entries in decreasing order of the value of the latest data points presented. This hopefully may help colour-blind readers to interpret the graph contents.

[4] The **doubling time** is a characteristic of exponential growth. It is the period of time over which the number doubles in value, and is an inverse measure of the gradient of the curve. A doubling time makes most sense when the curve to which it applies is close to an exponential, i.e., a straight line on a semi-logarithmic graph. For this reason, in order to follow the evolution in the number of cumulative deaths per country, I fit an exponential to the data at the end of the curve (7 days’ data) and extract from this a “doubling time”. The doubling time means what it says: If the exponential tendency persists unchanged, the numbers of deaths at the end of the doubling time will be double the current number. Example based on US data: On 29/08/2020 no. deaths was 188 900 and doubling time was 116 days. This implies no. deaths on 23/12/2020 (116 days later) will have doubled – to 377 800. The actual number on that date was 339 422, which reveals that there was a decline in the exponential tendency – but not by that much. Clearly, long doubling times are good; short ones are bad. The interest in presenting these doubling times is that they are to some degree predictive of future behaviour.

[5] Warning: National data on testing are not really comparable between countries, but do reveal trends in individual countries.

[6] Vaccinations against COVID-19: These data are collected from official reports by the **Our World in Data team** and can be found [here](https://ourworldindata.org/covid-vaccinations).

*Note:** The denominator in the metrics displayed in this section is the total population of the country, and not the population eligible for vaccination (the latter is the denominator most frequently used in data published by national authorities themselves).

[7] The states I originally selected for this section were the top 12 states by cumulative deaths:
- AZ, CA, FL, GA, IL, MA, MI, NJ, NY, OH, PA & TX.

In 2022 TN entered the Top 12 displacing MA, but, since I have not recorded TN historical data, I’ll continue to focus on the original Top 12.

[8] The sources of the NYC & Long Island data are **not the same** as the one used for national data: