

COVID-19 Biweekly Newsletter

Issue N° 79, Sunday, 2020-11-29

@ dr.david.lloydowen@gmail.com

Contents: Global overview / National comparisons / EU Test Comparisons / US States focus / Re-confinement... Social distancing in Ipswich / [Notes]

Global overview: [0]

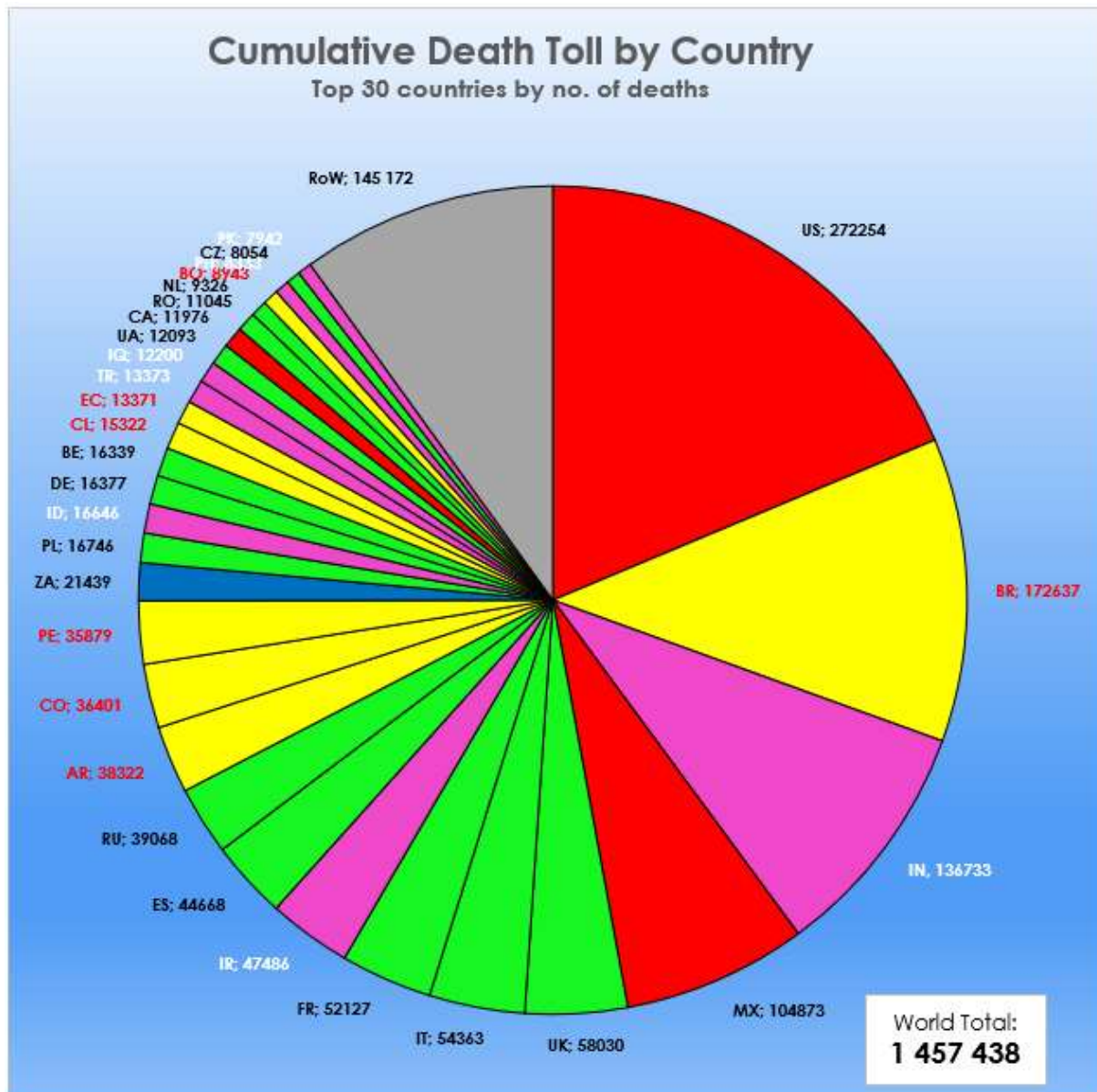
Since last time:

- The global death rate has been flat for the last 4 days.
Have we reached the peak of the 2nd wave? Time will tell...
- No new countries with >1000 COVID-19 deaths



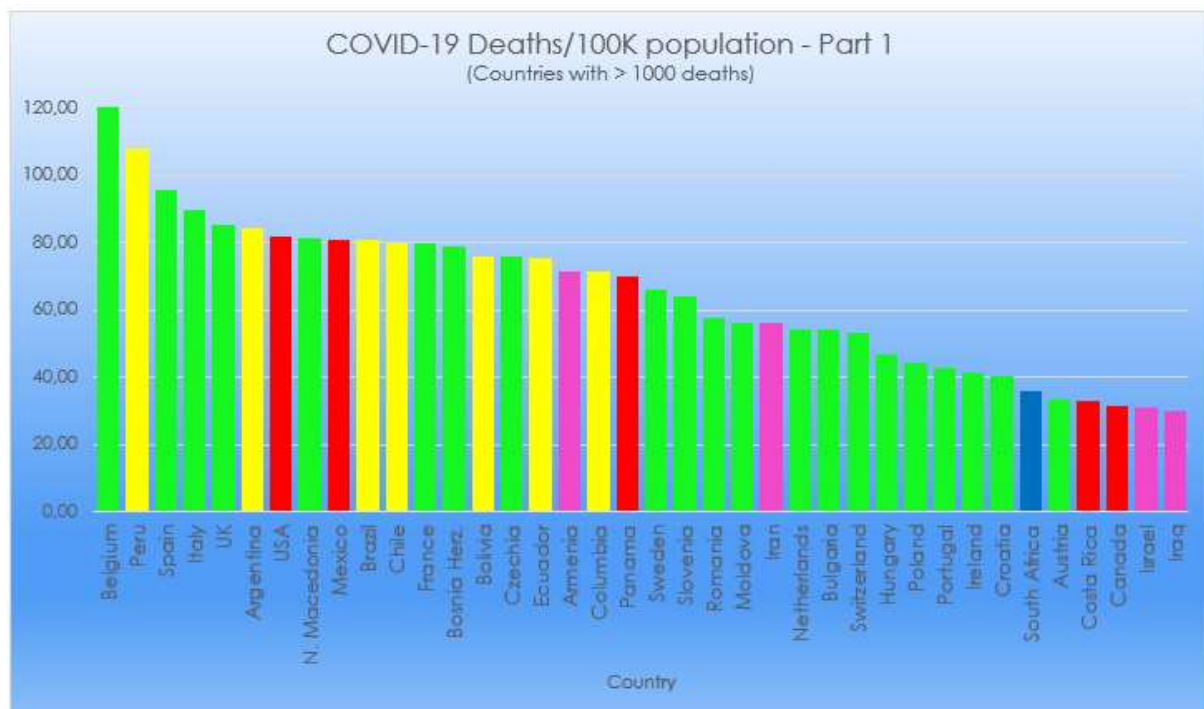
Cumulative death tolls for the top 30 countries [0]: **N. America**, **S. America**, **Europe**, **Asia**, & **Africa**

A resurgence of COVID-19 in European countries – notably Russia, Poland, Germany – is pushing Latin American countries (AR, CO, PE, CL & EC) down the ranking:

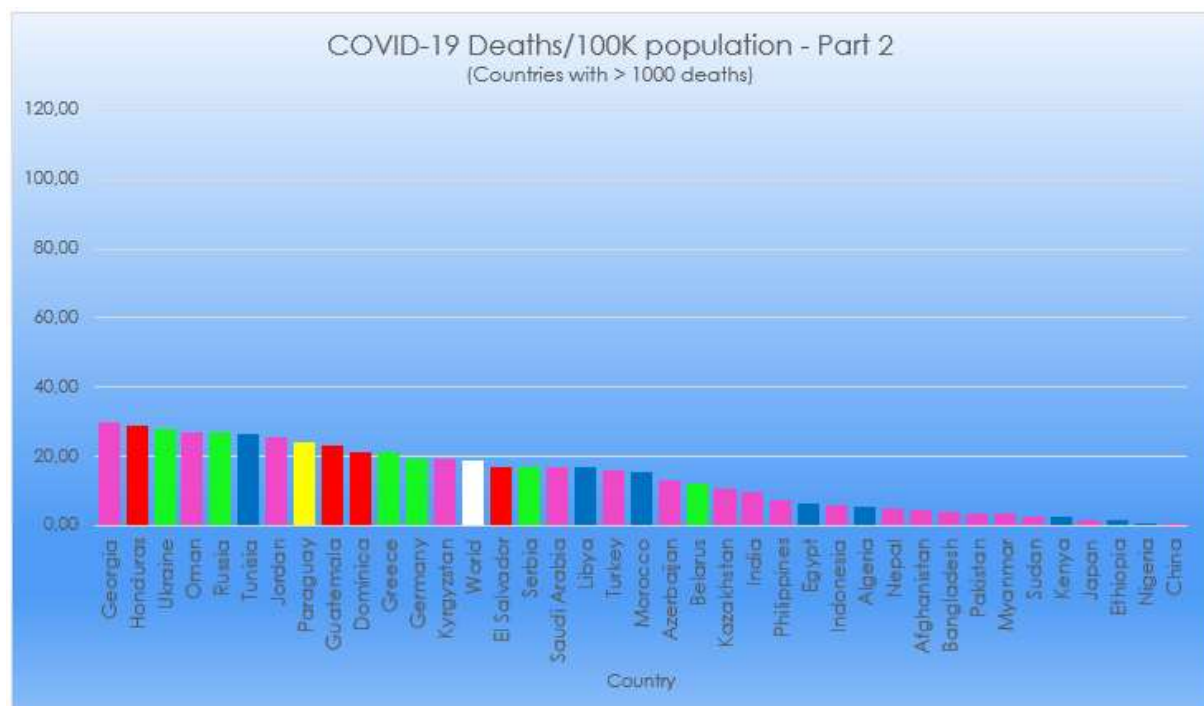


Amongst the other >1000-death countries not shown above, there is also a lot of movement – most notably for Austria, Greece (again), Serbia & Slovenia.

Per-capita death rates for all 76 countries with >1000 deaths:



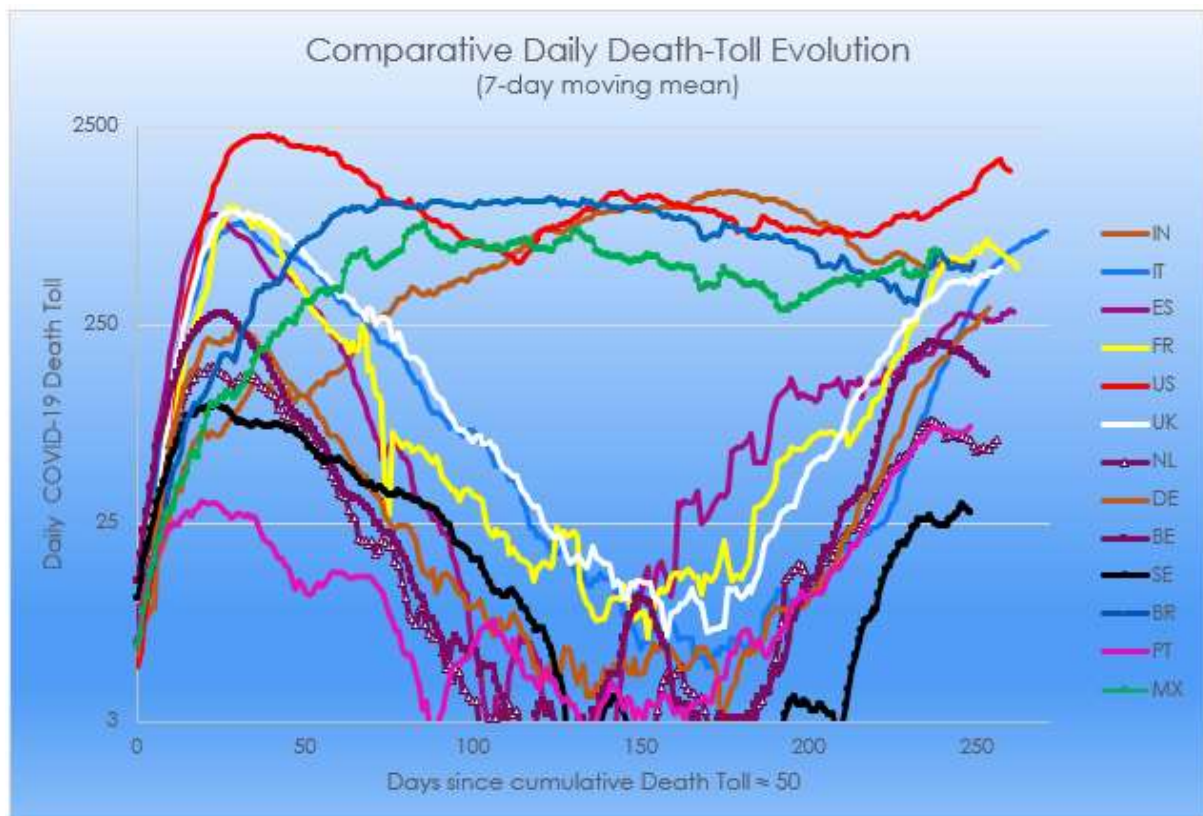
Lots of movement (again!): UK overtakes AR; North Macedonia overtakes MX, BR, CL, FR & BO; Mexico overtakes BR & CL; Czechia overtakes EC; Bosnia Herzegovina overtakes BO & EC; Czechia overtakes EC; Armenia overtakes CO & PA; Romania overtakes MD & IR; Poland overtakes PE & IE; Portugal overtakes IE; Croatia overtakes ZA; Canada overtakes IL, Austria overtakes CR, CA, IL, IR & HN.



Movement to the left in Part 2: Georgia, Ukraine, Jordan (again), Greece (again), Germany, Serbia, & Azerbaijan

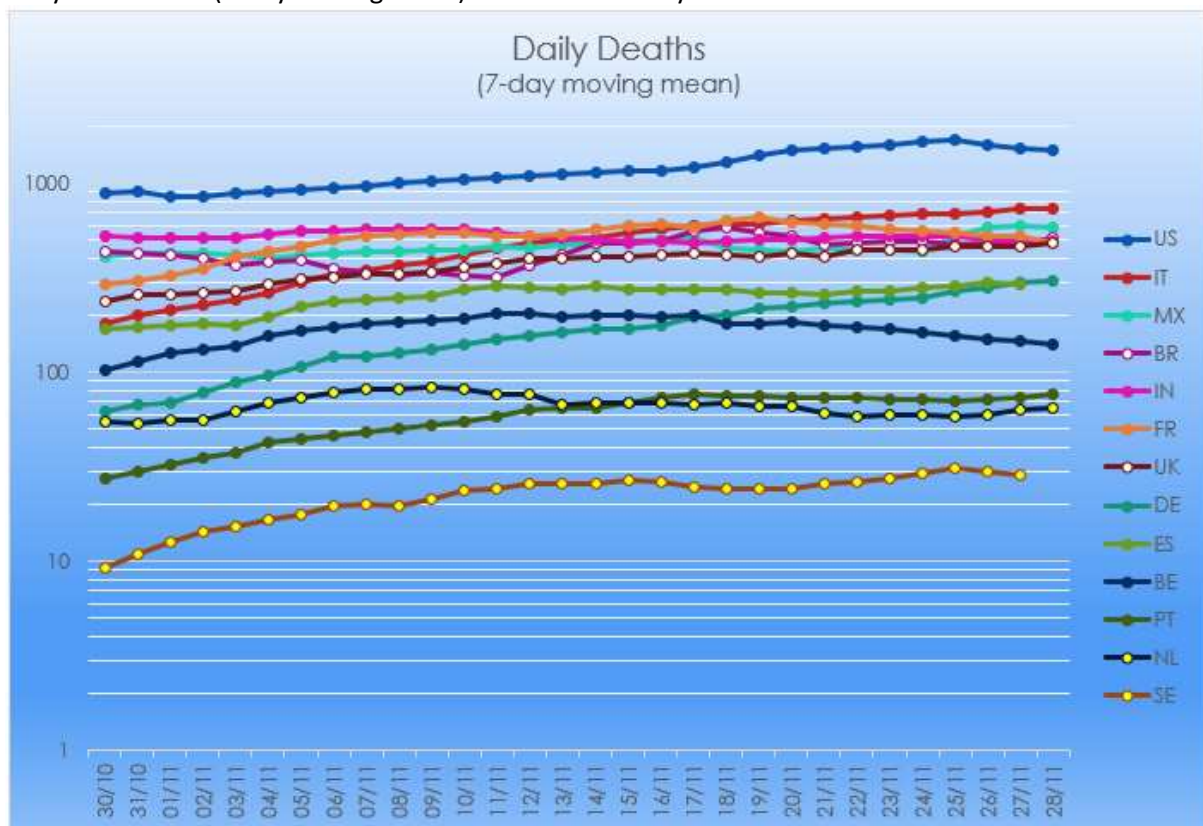
National comparisons (selected countries)

Here is the evolution in daily deaths rates (7-day moving mean) since each country's "Day0" [1]:



(Log y scale!)

Daily death rates (7-day moving mean) for the last 30 days:



(Log y scale!)

Comments apply to both of the above graphs:

- US daily death rate has finally started to fall since last time.
- Italy continues to rise.
- The next group – MX, BR, IN, FR & UK - are approximately stable.
- Germany continues to rise; Spain is stable; Belgium is falling.
- Portugal & Netherlands rising slightly; Sweden falling last 2 days.

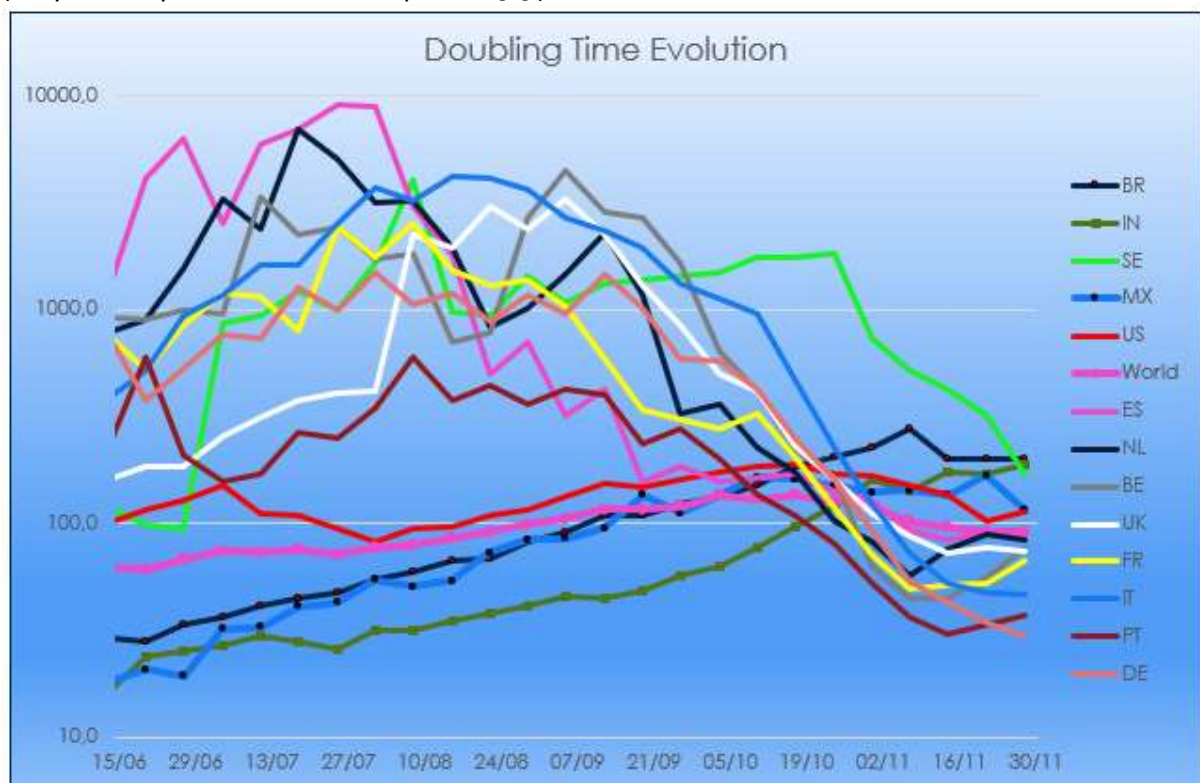
Tendencies: Comparison of time scales [2, 3]

Double digits, triple+shortening, triple, quadruple

Country	1st death	Days since 1st death	"Day0"	Days since "Day0"	Doubling time (7-day fits)		
					28 Nov	24 Nov	21 Nov
IT	21 Feb	281	02 Mar	271	47 days	51 days	48 days
FR	15 Feb	287	11 Mar	262	67 days	64 days	52 days
ES	03 Mar	270	11 Mar	262	84 days	120 days	91 days
US	29 Feb	273	13 Mar	260	113 days	120 days	102 days
UK	05 Mar	268	16 Mar	257	74 days	93 days	77 days
NL	06 Mar	267	17 Mar	256	84 days	120 days	89 days
DE	09 Mar	264	19 Mar	254	30 days	44 days	35 days
BE	11 Mar	262	20 Mar	253	78 days	70 days	56 days
SE	11 Mar	262	24 Mar	249	169 days	232 days	318 days
BR	17 Mar	256	24 Mar	249	200 days	288 days	201 days
PT	16 Mar	257	25 Mar	248	37 days	38 days	34 days
IN	12 Mar	261	26 Mar	247	189 days	178 days	170 days
MX	19 Mar	254	03 Apr	239	116 days	137 days	168 days
World	11 Jan	322	25 Jan	308	91 days	102 days	91 days

- Little change in the past week (compare 28/11 data with 21/11 data [3])
- Slight improvement, perhaps for IN, US, FR & BE.
- MX & SE shortening.

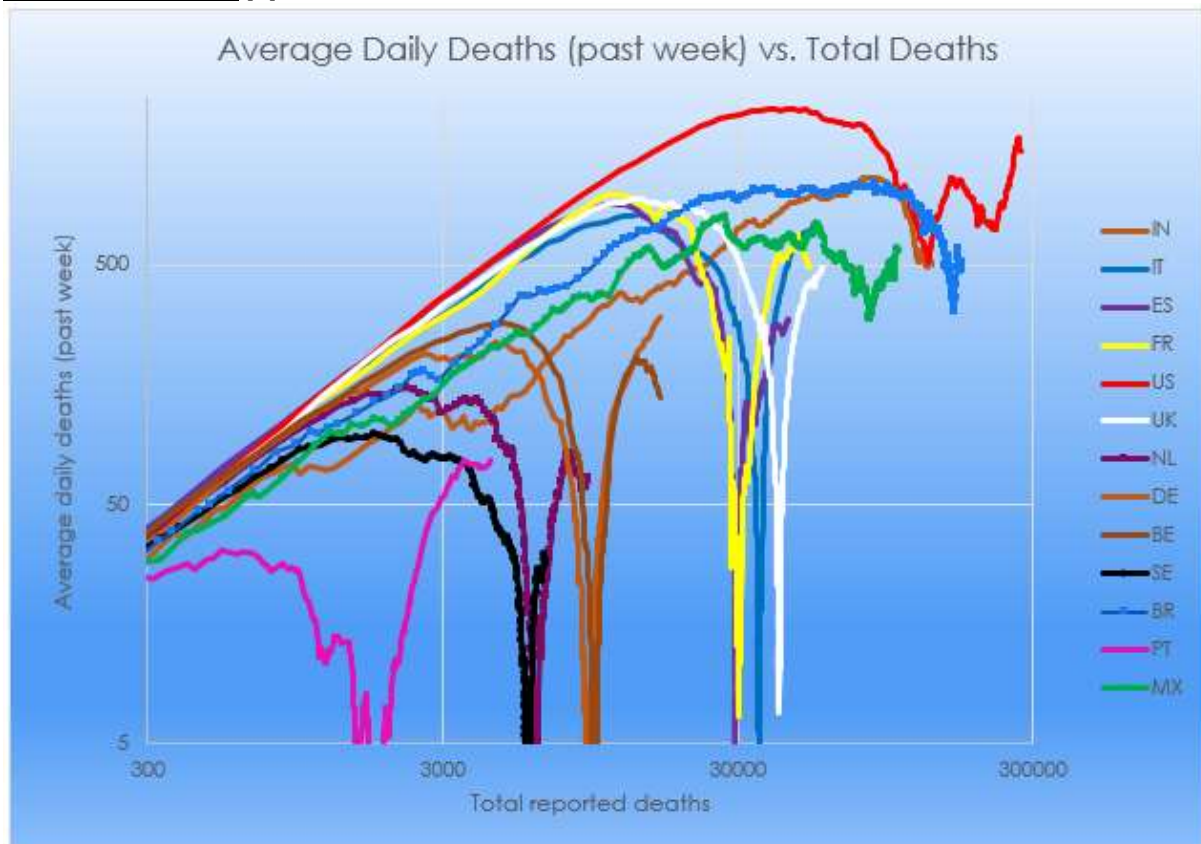
This is how doubling times have been evolving since mid-June:
(Only "Sunday" values have been plotted [3].)



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

Longest doubling time shown today is 200. Look how many doubling times were above 1000 in August!

Predictive statistics [4]

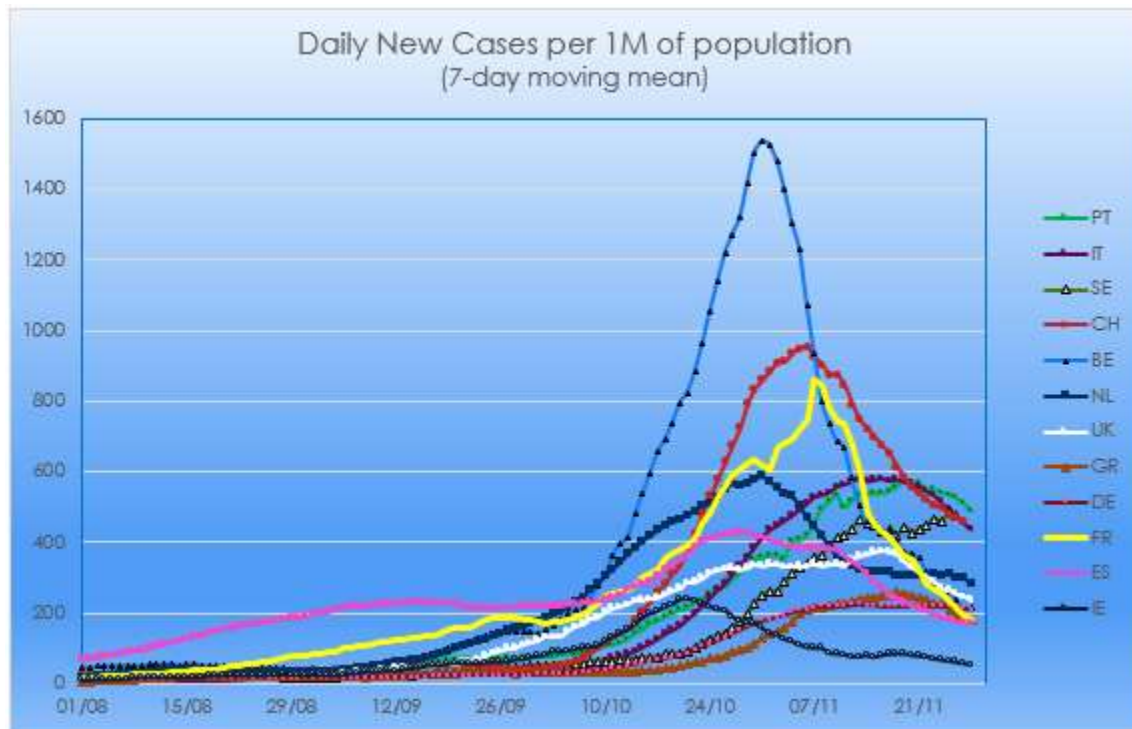


(Log-log graphic!)

Are FR, BE & NL starting to show signs of the dropping down we want to see?

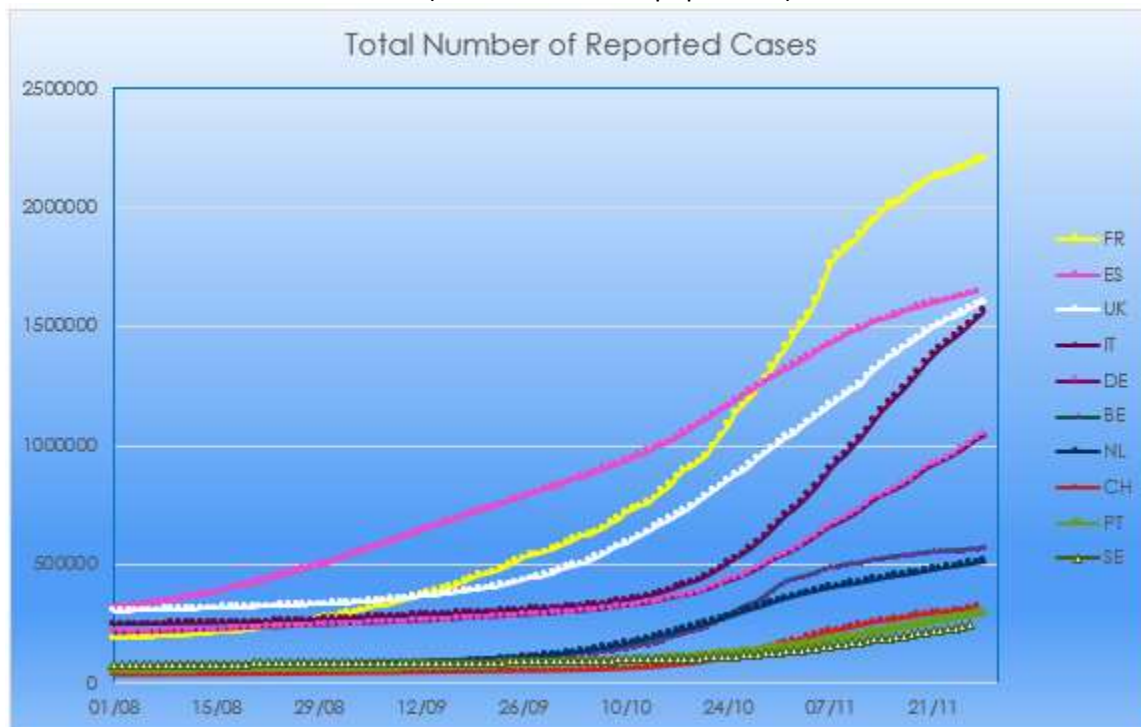
EU Test Comparisons

Warning: National data on testing are not really comparable [6].



Continued strong reduction in infection rates for many countries.
Sweden & Germany are the exceptions.

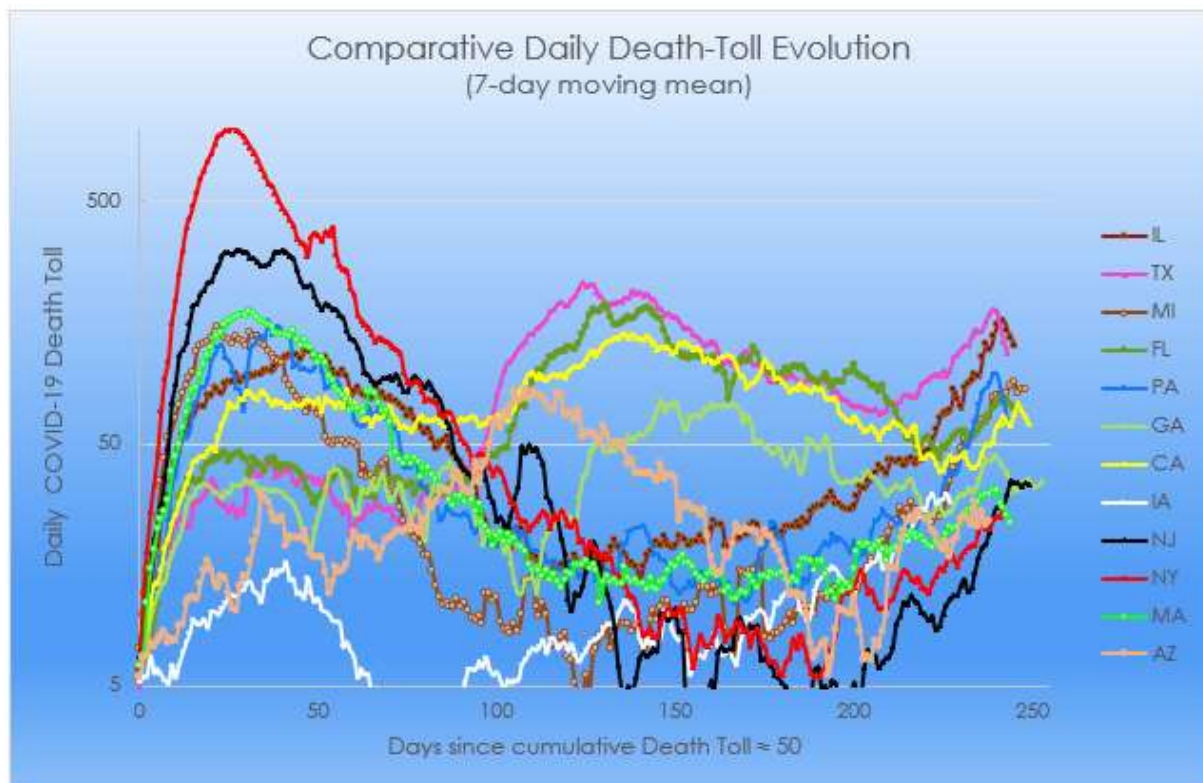
Here are the total number of cases (not normalized to population):



Spain; UK, Italy continue to converge (no significance in this, however).

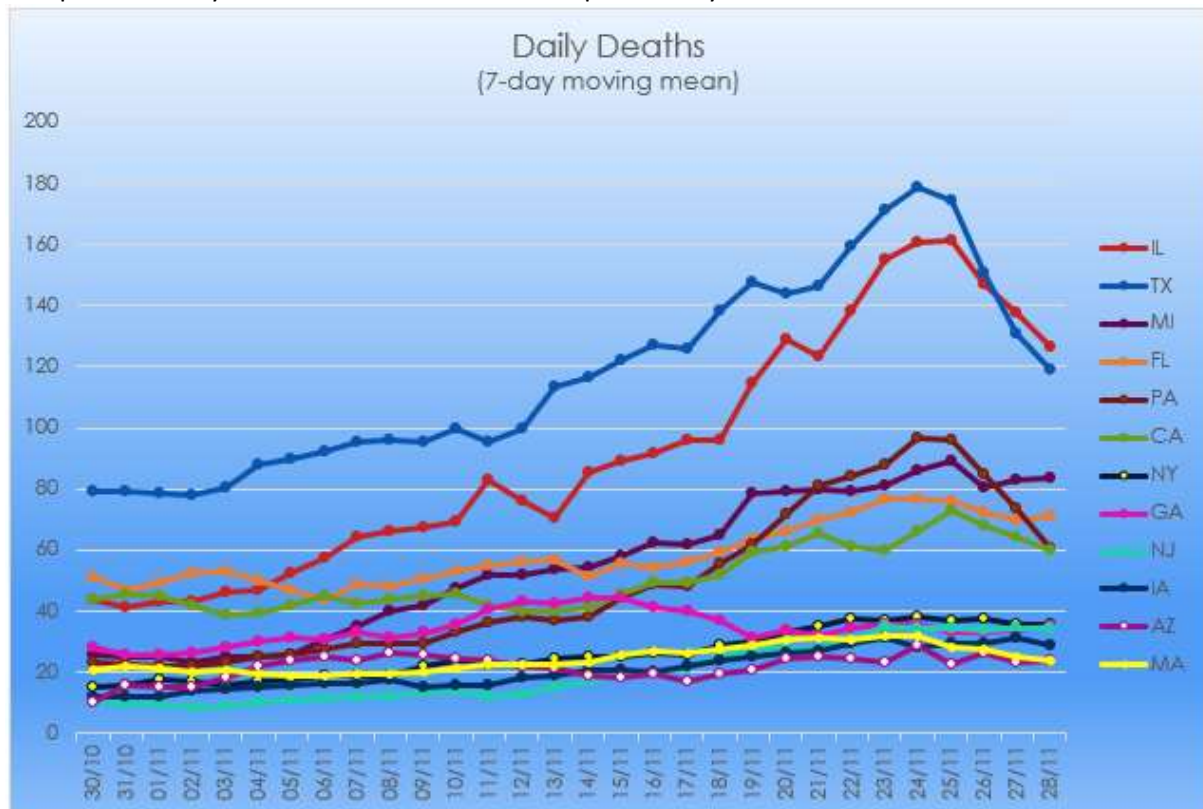
US States Focus (selected states)

Comparative Daily Death Toll evolution since each state's Day0 [1]:



(Log y scale!)

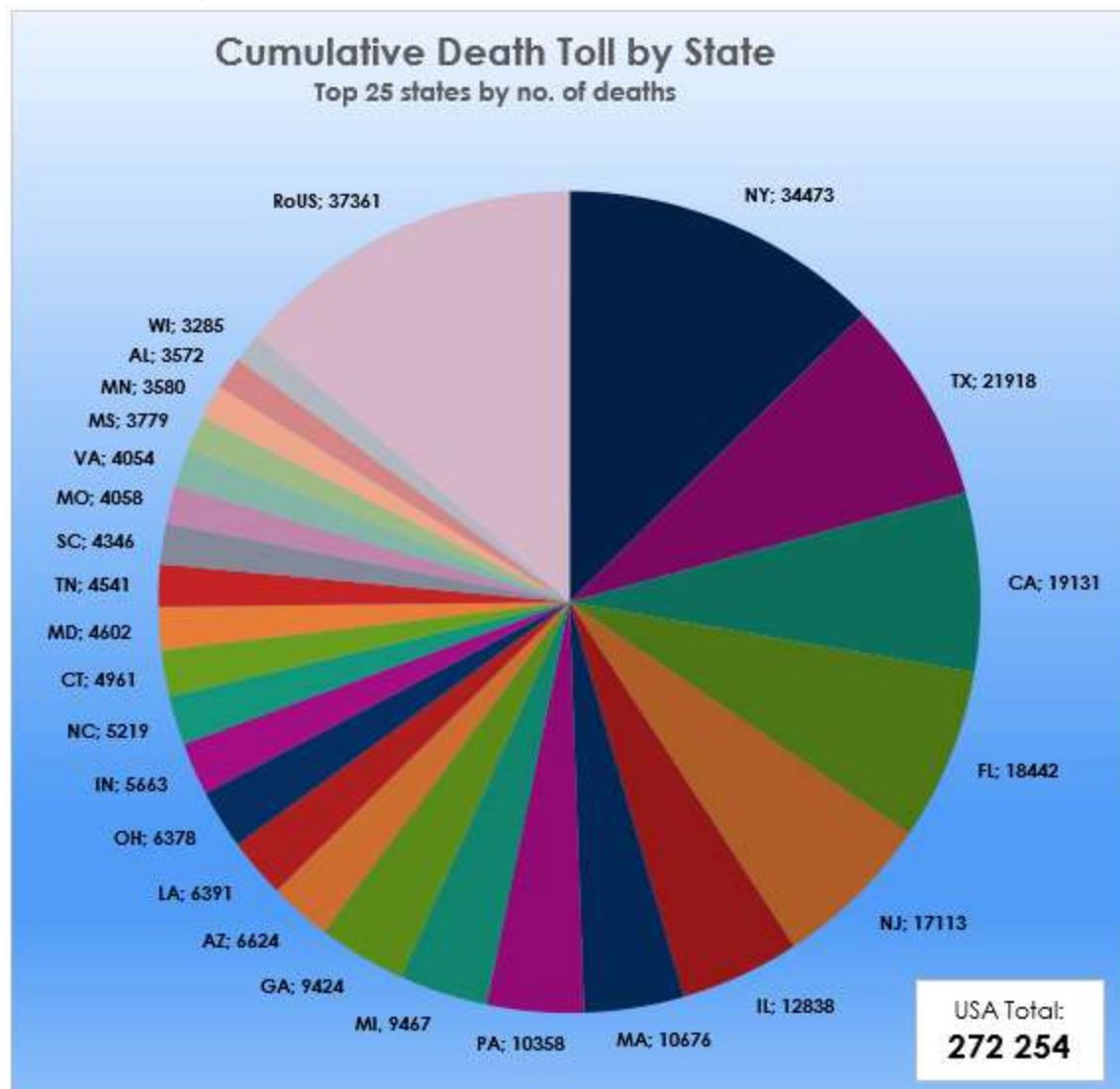
Comparative Daily Death Toll evolution over the past 30 days:



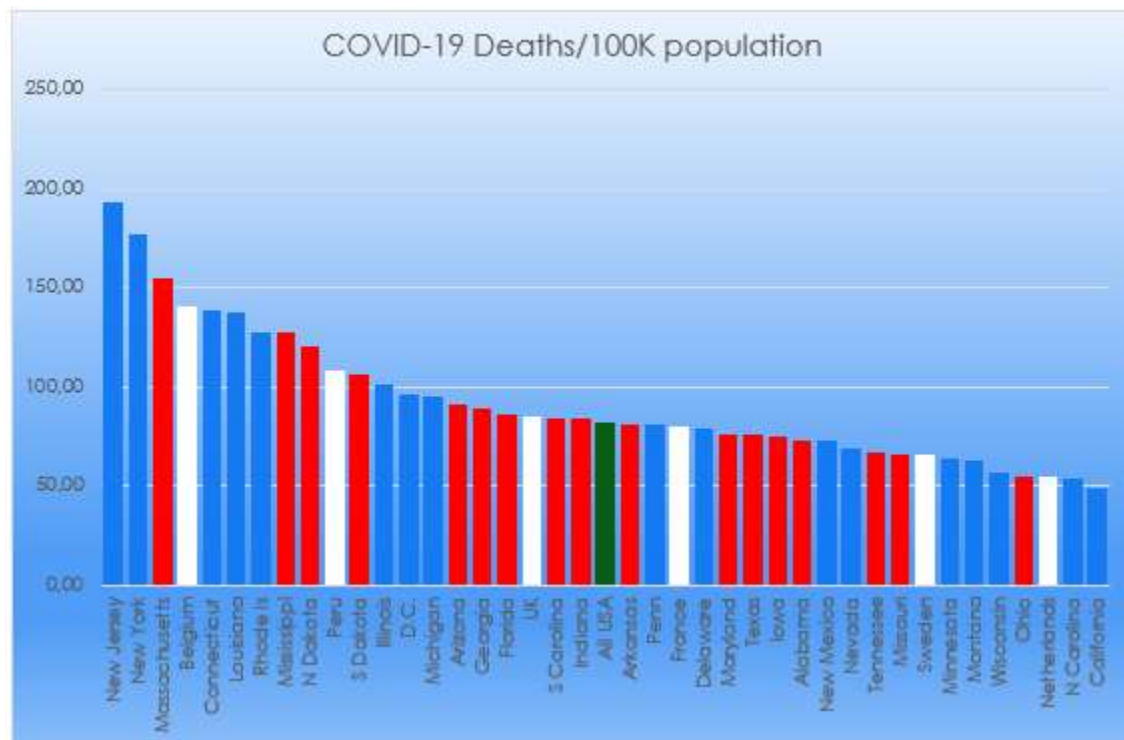
Comments apply to both of the above graphs:

- Illinois now leads Texas. Michigan & Florida follow.
- Pennsylvania & California are falling (esp. PA).
- Down at the bottom, NY, Georgia, NJ, Iowa, Arizona & Mass are relatively stable.

Cumulative death toll for the top 25 US states:
MI overtakes GA, MO overtakes VA & MN overtakes AL:



Per capita (includes all states in the Top 25 graph and any states with per-capita death rates higher than any member of that group):



Moving left are: RI, SD (again) & IA.

Tendencies: Comparison of time scales [2, 3]

Double digits, triple+shortening, triple, quadruple

State	1st death	Days since 1st death	"Day0"	Days since "Day0"	Doubling time (7-day fits)		
					28 Nov	24 Nov	21 Nov
AZ	20-mars	253	04 Apr	238	162 days	179 days	151 days
CA	04-mars	269	24 Mar	249	180 days	235 days	168 days
FL	06-mars	267	27 Mar	246	183 days	178 days	164 days
GA	14-mars	259	20 Mar	253	166 days	237 days	158 days
IA	24-mars	249	15 Apr	227	50 days	57 days	45 days
IL	17-mars	256	28 Mar	245	74 days	65 days	58 days
MA	20-mars	253	29 Mar	244	346 days	305 days	249 days
MI	18-mars	255	25 Mar	248	71 days	81 days	70 days
NJ	10-mars	263	24 Mar	249	354 days	442 days	370 days
NY	14-mars	259	20 Mar	253	661 days	700 days	641 days
PA	18-mars	255	30 Mar	243	114 days	88 days	79 days
TX	16-mars	257	30 Mar	243	134 days	108 days	84 days

- Only MI, IL & IA remain in double figures.
- Lengthening of doubling for almost all states.
(compare 21/11 with 14/11 values [3]).

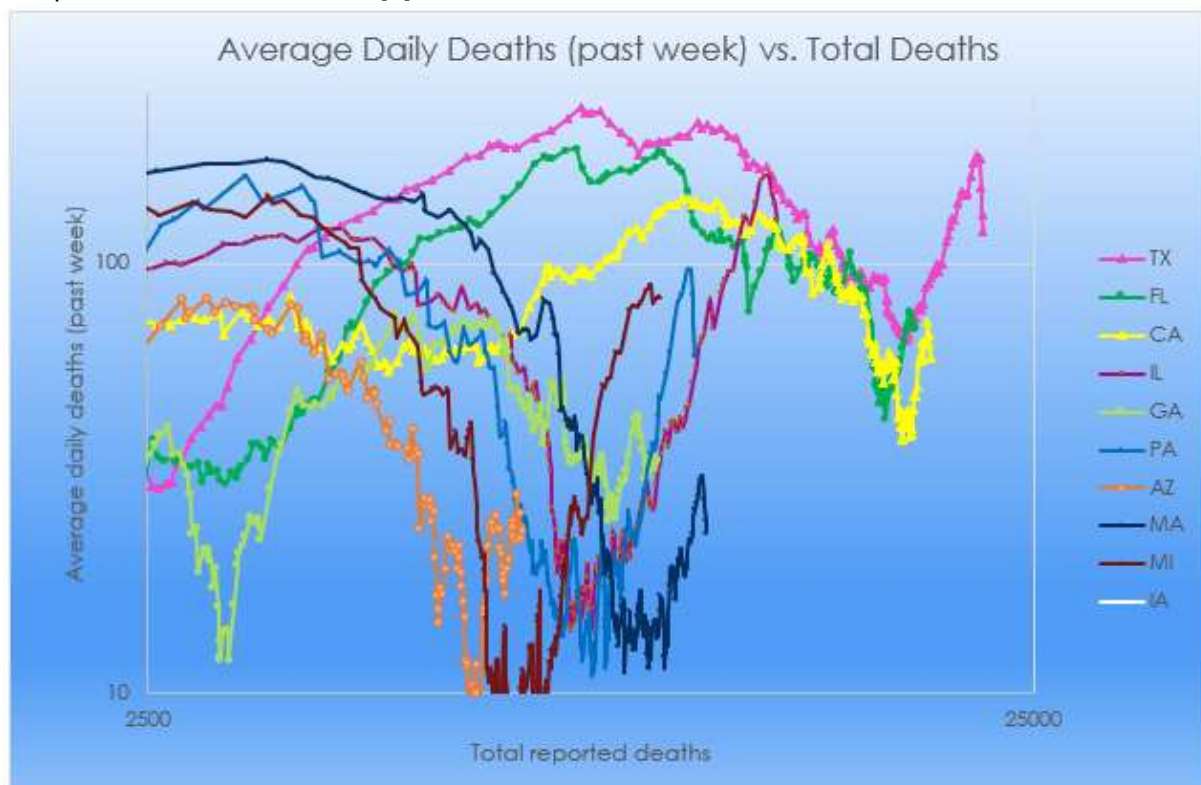
This is how doubling times have been evolving since mid-June:
(Only "Sunday" values have been plotted [3].)



(Log plot!)

All states lengthening...except for NJ.

The predictive view of the data [4]:



(Log-log plot; NJ & NY excluded to give prominence to the other states.)

Some good news:

- Many states have started to drop down in the last few days.

— IA is off scale (below & left).

Next update on Wednesday.

Keep well, keep safe, keep isolated!

David

Re-confinement: Social distancing UK-style in Christchurch Park, Ipswich. Thanks, **Susan**





Please send me your images for this space...

Notes

[0] The national COVID-19 data are taken from the [worldometer website](https://www.worldometers.info/) 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 recently changed the 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 not reported a single COVID-19 death since 17th May!

- Some countries, notably Sweden & Spain, regularly update the entire set of historical data provided to the website. Other countries, e.g., UK & USA, do the same but more rarely.

ISO two-letter country codes used in this Update							
All	World	CN	China	HR	Croatia	MK	North Macedonia
AF	Afghanistan	CO	Columbia	HU	Hungary	MM	Myanmar
AM	Armenia	CR	Costa Rica	ID	Indonesia	MX	Mexico
AR	Argentina	CZ	Czechia	IE	Ireland	NL	Netherlands
AT	Austria	DE	Germany	IL	Israel	NO	Norway
AZ	Azerbaijan	DK	Denmark	IN	India	NP	Nepal
BA	Bosnia Herzegovina	DO	Dominican Rep.	IQ	Iraq	OM	Oman
BD	Bangladesh	DZ	Algeria	IR	Iran	PA	Panama
BE	Belgium	EC	Ecuador	IT	Italy	PE	Peru
BG	Bulgaria	EG	Egypt	JO	Jordan	PH	Philippines
BO	Bolivia	ES	Spain	JP	Japan	PK	Pakistan
BR	Brazil	ET	Ethiopia	KE	Kenya	PL	Poland
BY	Belarus	FI	Finland	KG	Kyrgyzstan	PT	Portugal
CA	Canada	FR	France	LY	Libya	PY	Paraguay
CH	Switzerland	GR	Greece	MA	Morocco	RO	Romania
CL	Chile	GT	Guatemala	MD	Moldova	RoW	Rest of World
RS	Serbia						
RU	Russia						
SA	Saudi Arabia						
SD	Sudan						
SE	Sweden						
SI	Slovenia						
SV	El Salvador						
TN	Tunisia						
TR	Turkey						
UA	Ukraine						
UK	UK						
US	USA						
ZA	South Africa						

[1] For comparison purposes, the data of individual countries have been shifted horizontally so that a synchronization occurs at the same point on the horizontal (time) axis which I denote “Day0”. Day0 has been chosen to be the date on which the cumulative number of deaths was closest to **50** for the country concerned.

[2] The doubling time is a characteristic of exponential growth. It is the period of time over which the number of cases double, and is an inverse measure of the gradient of the curve. A doubling time makes sense when the curve 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.

Clearly, long doubling times are good; short ones are bad.

[3] Saw-tooth effect: Doubling times published in the Wednesday report (extracted from Wed-Tue datapoints) are systematically longer than doubling times published in the Sunday report (extracted from Sun-Sat datapoints). This is associated with weekend reporting delays.

[4] One of the characteristics of the exponential function is that the gradient (or rate of change), is proportional to the value of the function.

(For those who remember their calculus, the solution of $df(t)/dt = k f(t)$ is $f(t) = e^{kt}$.)

By plotting the change (number of deaths in a given period) on the y-axis against the total number of deaths on the x-axis, an exponential gives a straight line on a log-log graph. When the mortality rate stops being exponential, the country curve plummets down from the main sequence.

The points represent values on a succession of days, the end point being yesterday. The more closely spaced are the points (days), the slower the evolution; the greater the distance between points, the faster the evolution.

To give a clearer meaning to the y-axis data, we plot the average no. of deaths in the past 7 days vs. the cumulative no. of deaths on the x-axis.

This analysis was proposed by **Dr Aatish Bhatia**. An animated version of this graph can be viewed on his [website](#). (Use the panel on the right to configure for *Reported Deaths* and select the countries to be viewed.)

An entertaining video explaining this presentation of the data can be found [here](#).

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

Source for the 5 boroughs:

<https://github.com/nychealth/coronavirus-data/blob/master/totals/by-boro.csv>

Source for Nassau & Suffolk counties:

<https://www.nytimes.com/interactive/2020/us/coronavirus-us-cases.html#states>

[6] **Testing policies vary widely & unpredictably both regionally and in time.**

(The only reason I include these data is because they influence government policy for some govts.)