COVID-19 Biweekly Newsletter
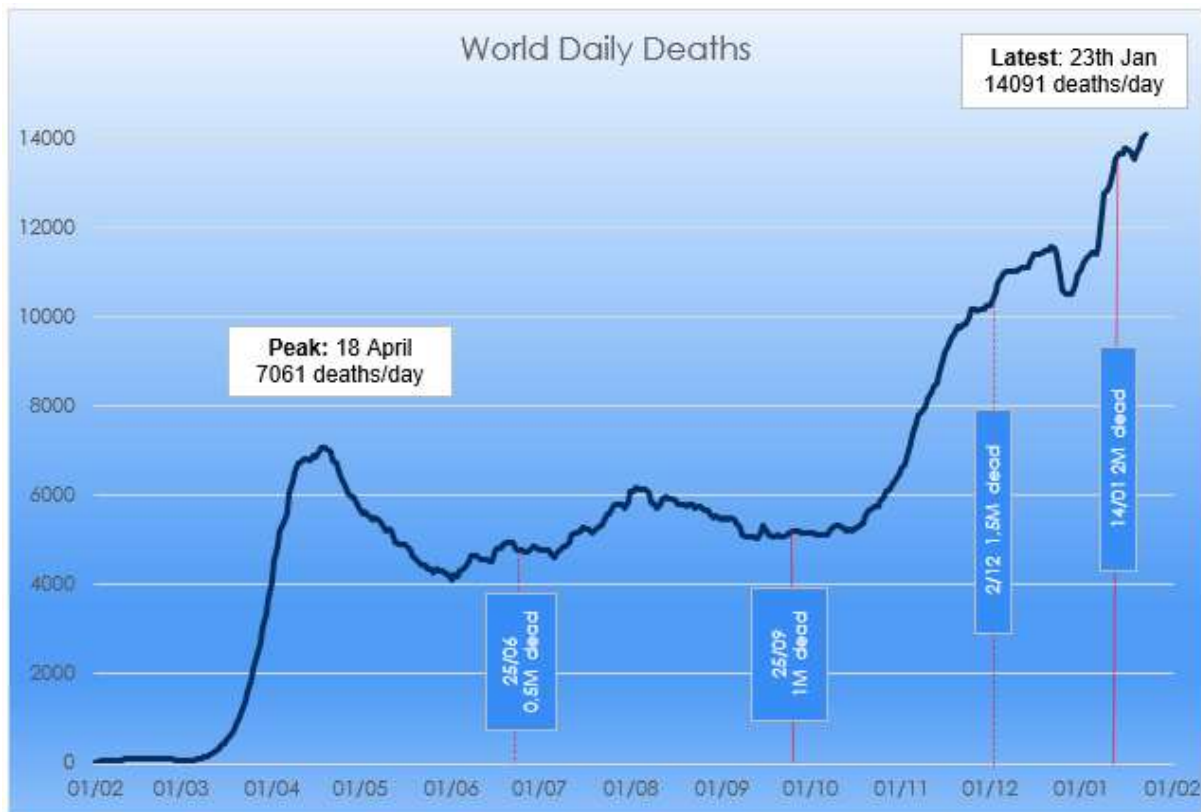Issue N° 95, Sunday, 2021-01-24
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Contents: Global overview / National comparisons / EU Test comparisons / US States focus / NYC&LI status / Today's images: Snow! / [Notes]

Global overview: [0]
Since last time:

- The average daily death toll is now double its peak Wave 1 value last April.
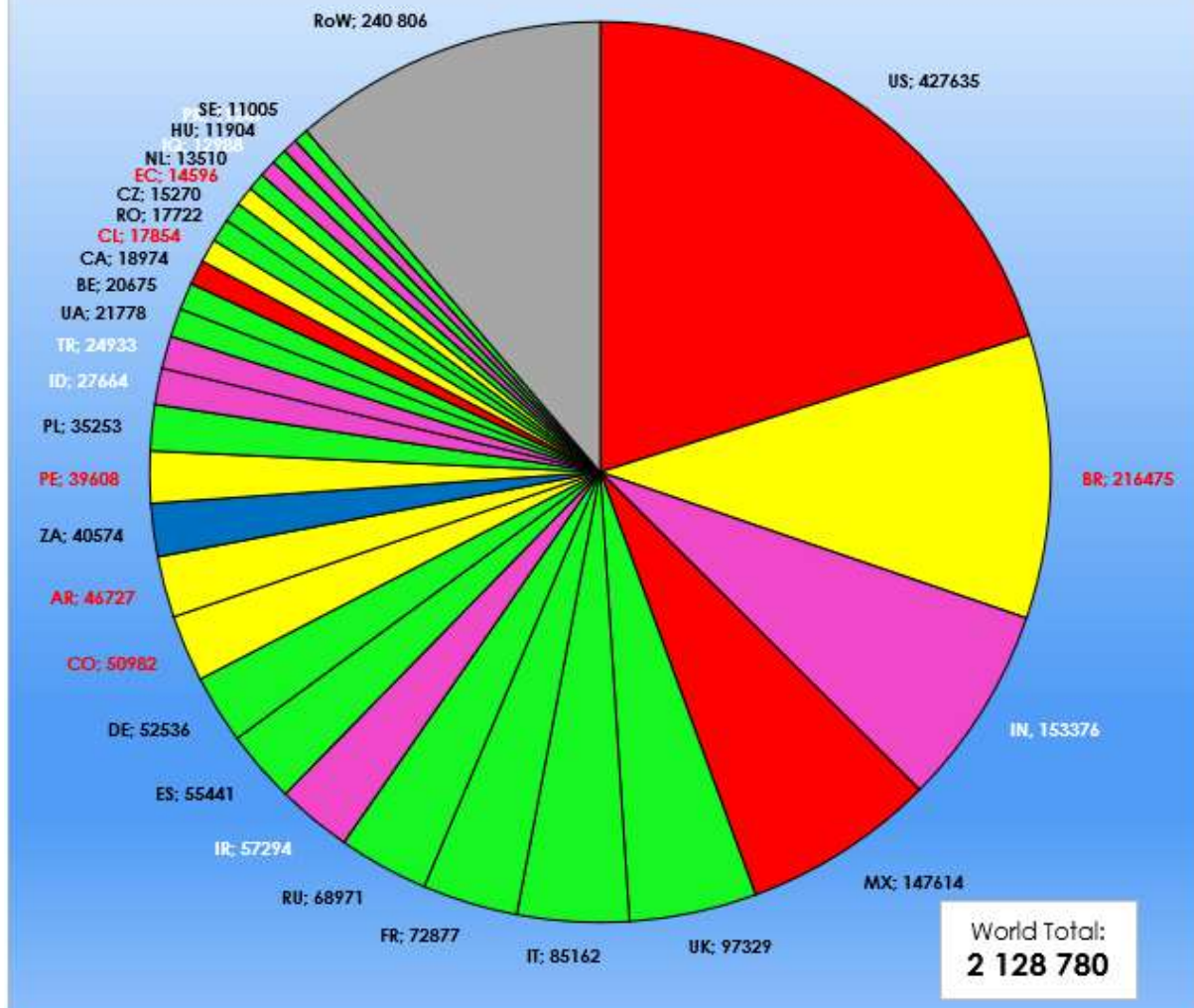- No new countries with >1000 COVID-19 deaths

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

- Germany overtakes Columbia; S. Africa overtakes Peru.

Cumulative Death Toll by Country
Top 30 countries by no. of deaths

RoW; 240 806
SE; 11005
HU; 11904
IQ; 12988
NL; 13510
EC; 14596
CZ; 15270
RO; 17722
CL; 17854
CA; 18974
BE; 20675
UA; 21778
TR; 24933
ID; 27664
PL; 35253
PE; 39608
ZA; 40574
AR; 46727
CO; 50982
DE; 52536
ES; 55441
IR; 57294
RU; 68971
FR; 72877
IT; 85162
UK; 97329
MX; 147614
IN, 153376
BR; 216475
US; 427635

World Total:
2 128 780

Amongst the other >1000-death countries not shown above, there is a lot of upward movement – most notably for PT, JP, IL, SK, MM, GE, IE, LT, KZ, BY, SV & KR. (again)

Per-capita death rates for all 84 countries with >1000 deaths:
European countries continue to dominate at the high end.

Tunisia joins S. Africa as the only African countries in the first graph.

COVID-19 Deaths/100K population - Part 1
(Countries with > 1000 deaths)
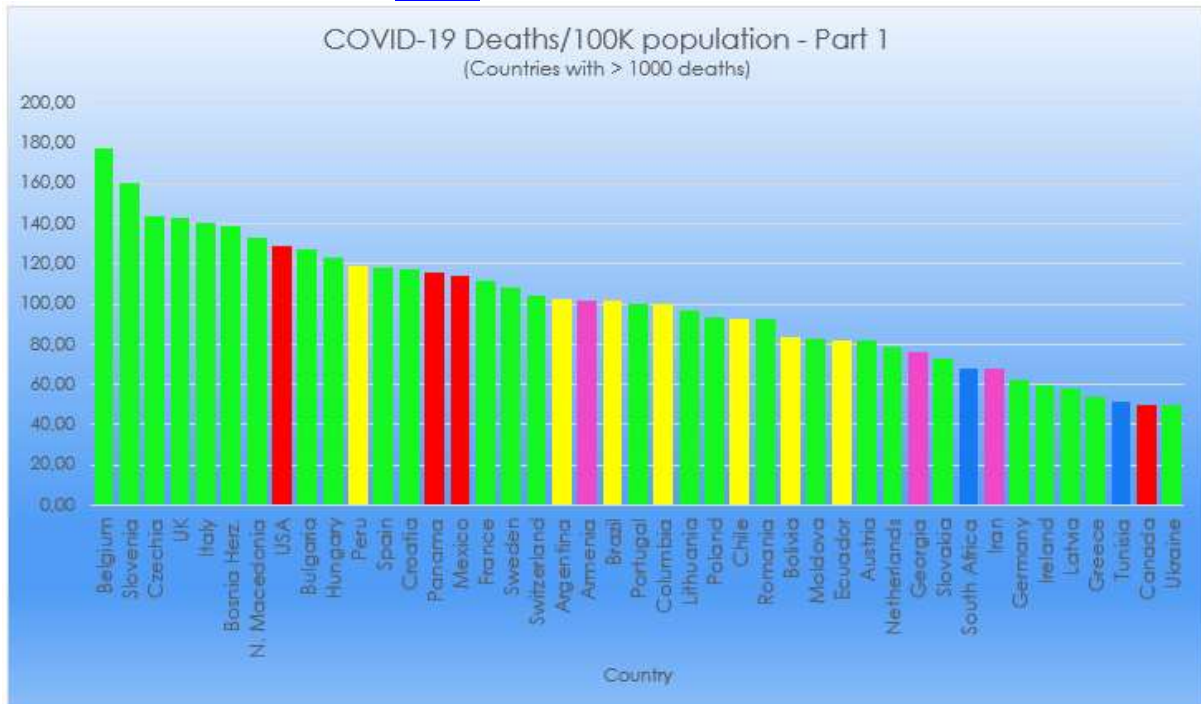
Moving left:
Mostly Eur. countries plus 3 others: UK & IT to 4th & 5th place, MX, PT, PL, SK, ZA, CA & UA. (again).
The bottom half is dominated by Asian countries:

COVID-19 Deaths/100K population - Part 2
(Countries with > 1000 deaths)
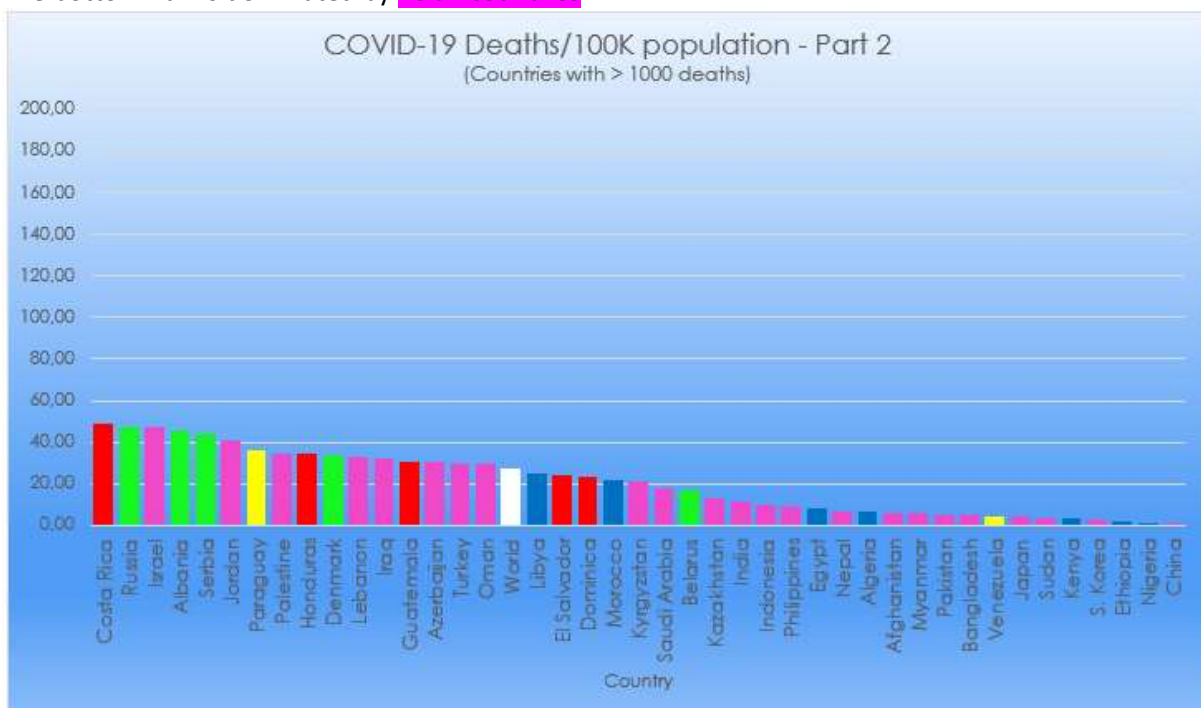
Movement to the left in Part 2: AL, PS, DK, LB, GT, TR & JP. (again)

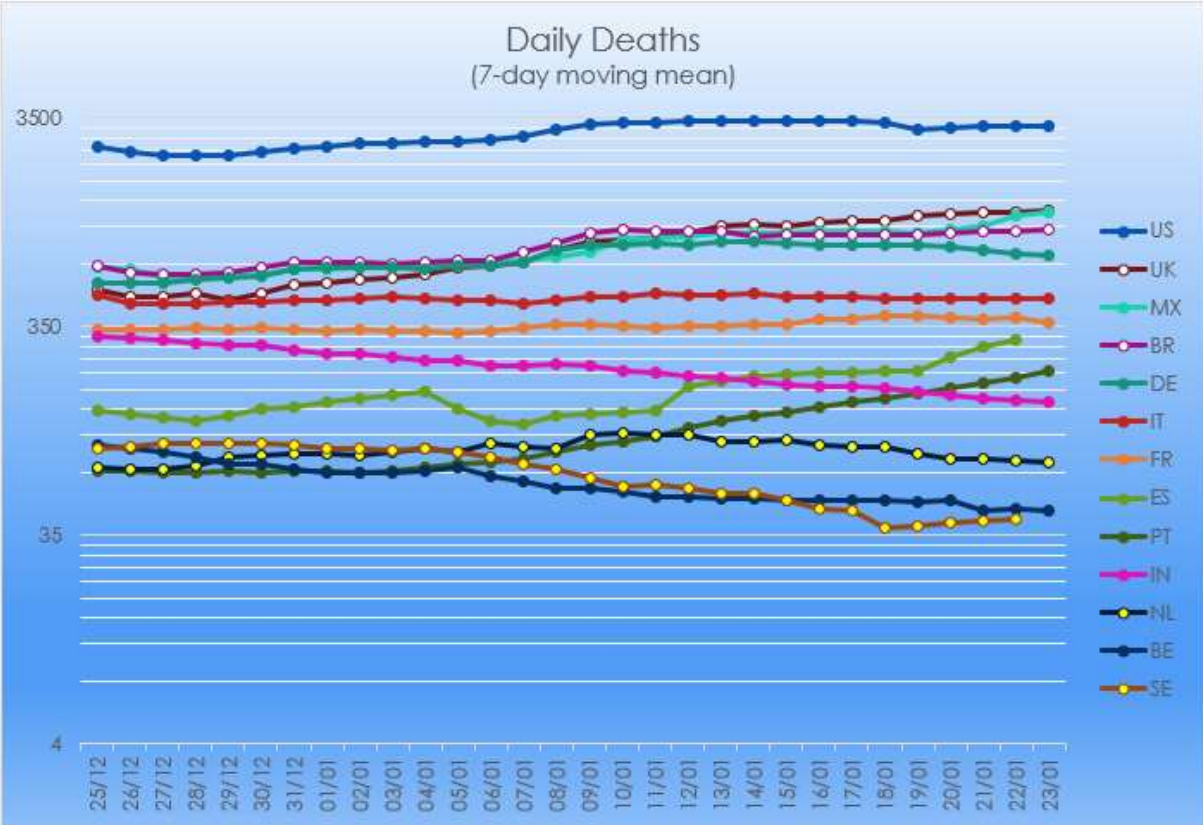**National comparisons** (selected countries)
Here is the evolution in daily deaths rates (7-day moving mean) since each country's "Day0" [1]:

Comparative Daily Death-Toll Evolution
(7-day moving mean)
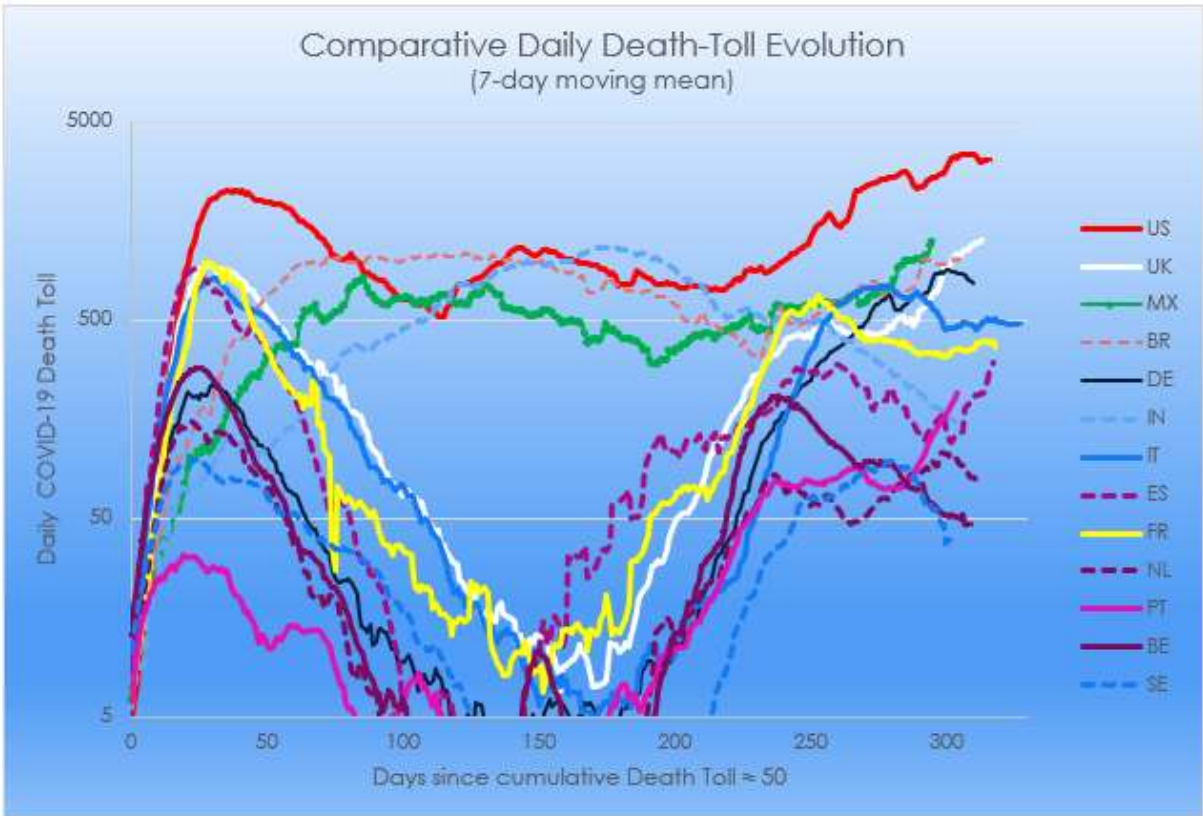
(Log y scale!)

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

Daily Deaths
(7-day moving mean)

(Log y scale!)
Comments apply to both of the above graphs:

- US daily death remains way ahead of all other countries, but has stopped rising.
- Next are UK & Mexico, both rising – especially the latter.
- Brazil & Germany – the latter falling.
- Lower down, Italy & France – flat, Spain & Portugal – both rising, India – falling,.
- Then - further down - Netherlands & Belgium both falling.
- Finally, Sweden - flat.

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)		
					23 Jan	19 Jan	16 Jan
IT	21 Feb	337	02 Mar	327	114 days	124 days	108 days
FR	15 Feb	343	11 Mar	318	135 days	139 days	130 days
ES	03 Mar	326	11 Mar	318	99 days	186 days	151 days
US	29 Feb	329	13 Mar	316	80 days	99 days	72 days
UK	05 Mar	324	16 Mar	313	46 days	57 days	47 days
NL	06 Mar	323	17 Mar	312	106 days	118 days	84 days
DE	09 Mar	320	19 Mar	310	39 days	44 days	30 days
BE	11 Mar	318	20 Mar	309	305 days	302 days	261 days
SE	11 Mar	318	24 Mar	305	181 days	495 days	419 days
BR	17 Mar	312	24 Mar	305	127 days	166 days	132 days
PT	16 Mar	313	25 Mar	304	30 days	37 days	38 days
IN	12 Mar	317	26 Mar	303	686 days	647 days	560 days
MX	19 Mar	310	03 Apr	295	77 days	101 days	93 days
World	11 Jan	378	25 Jan	364	94 days	112 days	93 days

- Little change in the past week (compare 23/01 data with 16/01 data [3]).
- Deterioration for ES, SE, PT & MX.
- Some improvement for IT, US, NL, DE, BE & IN.
- Poorest performance: PT, then DE, UK, MX, US & ES.

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.)
IN & BE doubling times are lengthening.
SE, ES, UK & PT doubling times are shortening.
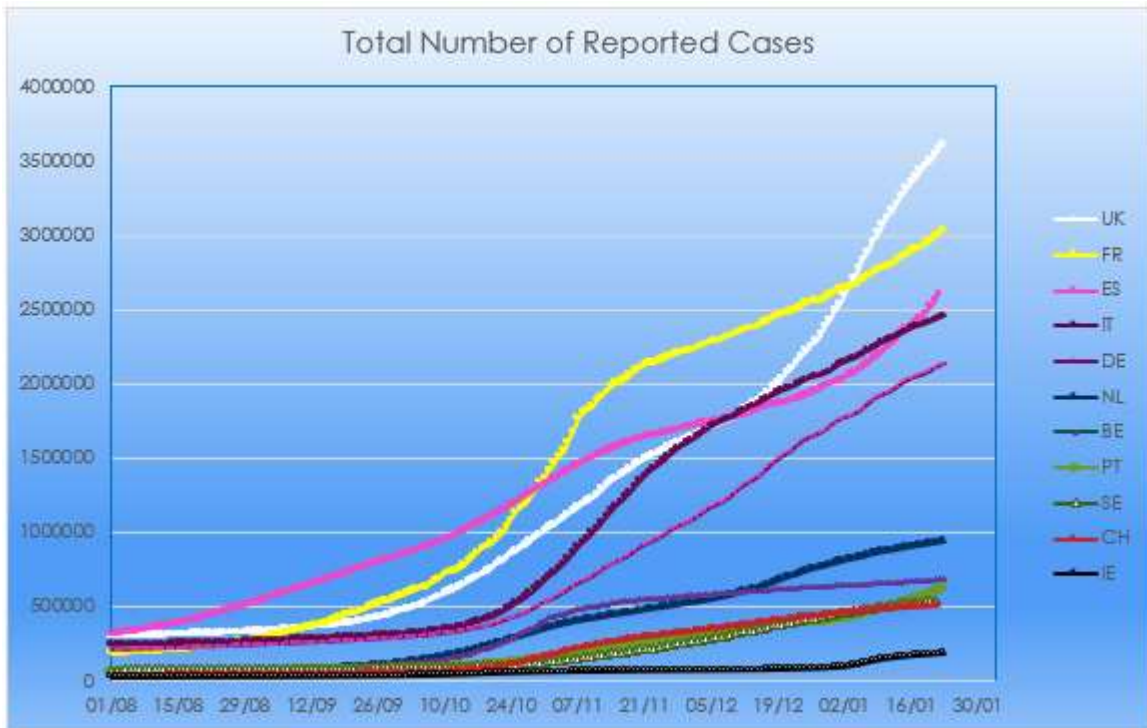The other doubling times are more or less constant.

EU Test Comparisons
Warning: National data on testing are not really comparable [6].
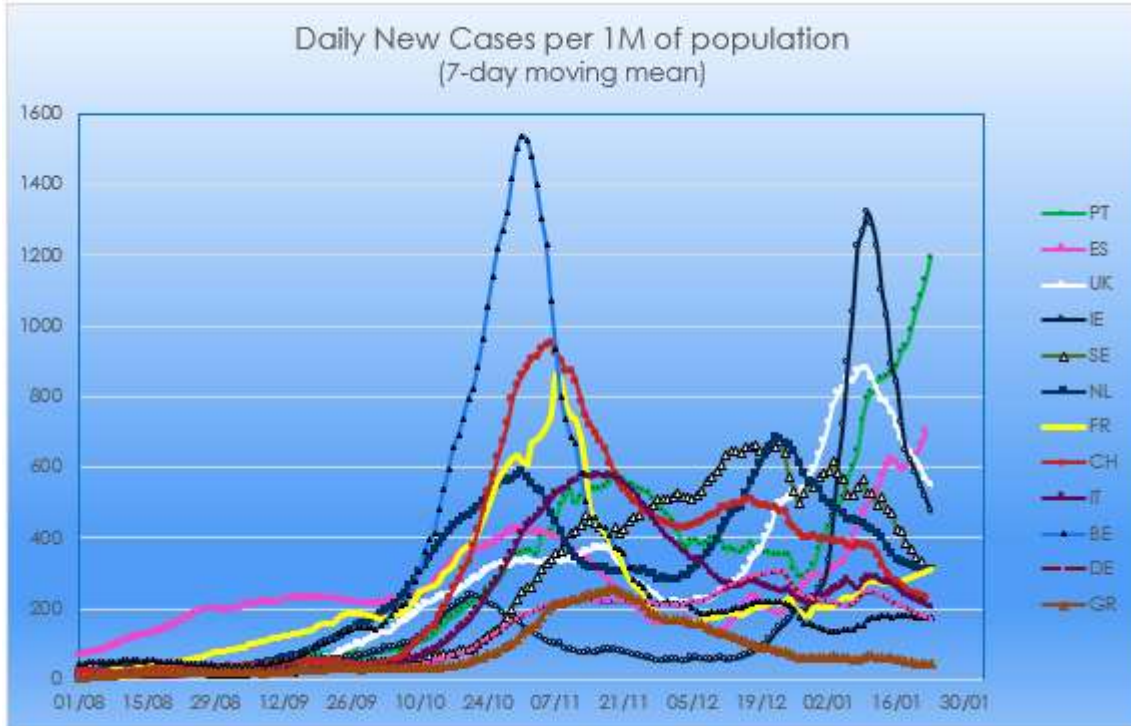
Cases are falling consistently now for IE, UK, SE, NL, CH & more slowly for IT & DE.
Still rising rapidly: PT & ES; FR more slowly.
The others are flat.

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

Total Number of Reported Cases

US States Focus (selected states)
Comparative Daily Death Toll evolution since each state's Day0 [1]:

Comparative Daily Death-Toll Evolution
(7-day moving mean)
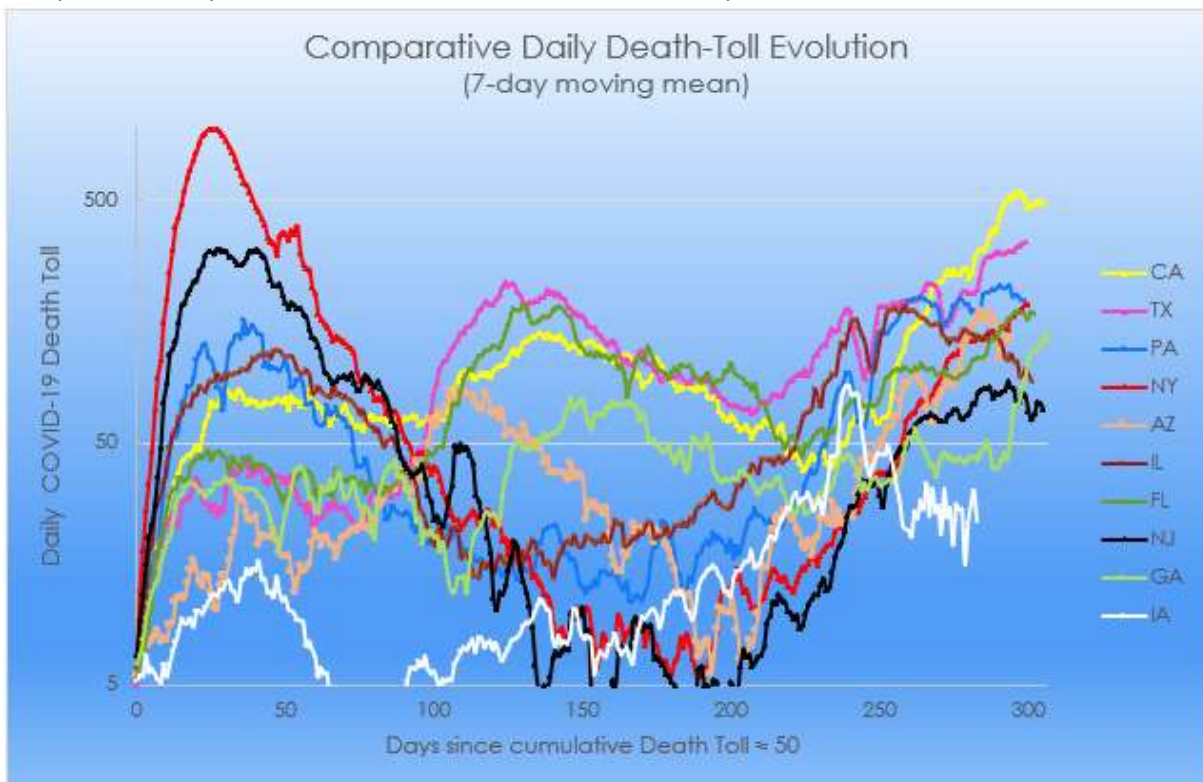
(Log y scale!)
Comparative Daily Death Toll evolution over the past 30 days:

Daily Deaths
(7-day moving mean)
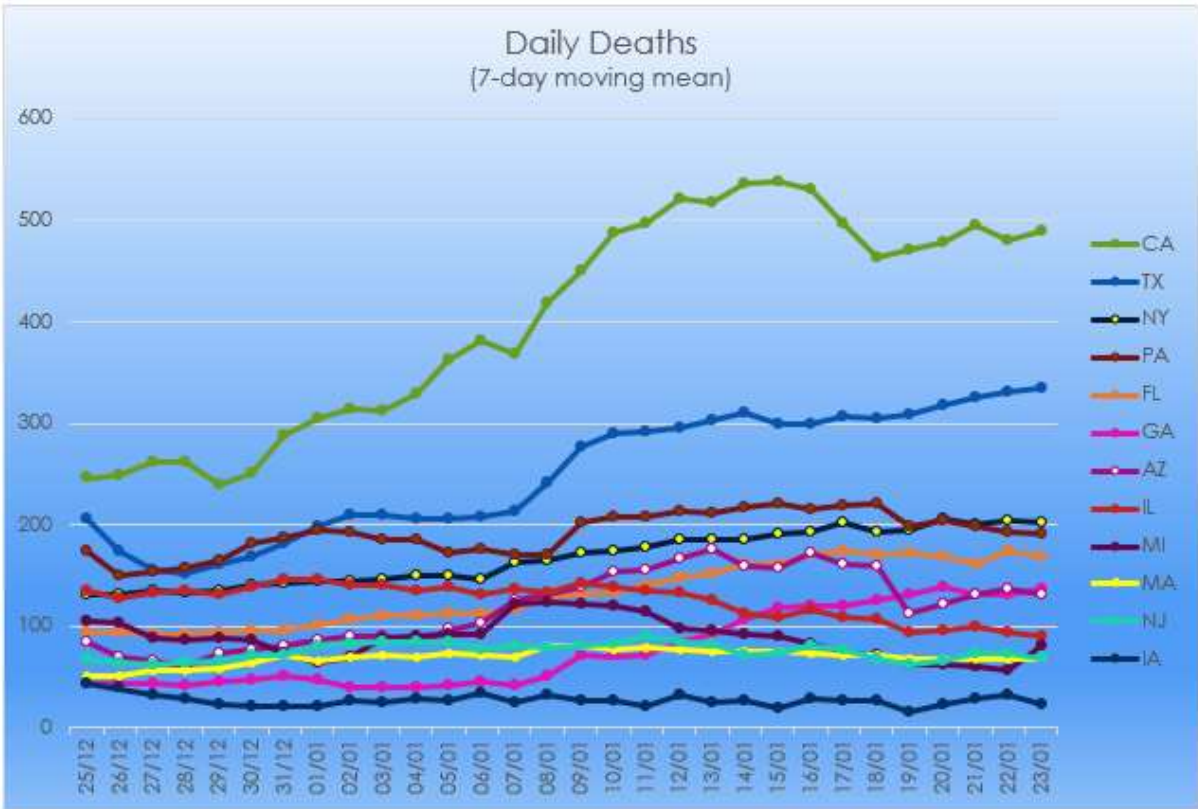
Comments apply to both of the above graphs:
- CA & TX way out in front, and rising.
- The other principal contributors (>100 deaths/day) to the US death toll: NY, PA, FL, GA & AZ

Cumulative death toll for the top **30** US states:
AL overtakes SC; and NC overtakes LA.

Cumulative Death Toll by State
Top 30 states by no. of deaths

RoUS; 45069
NY; 42212
NV; 4011
WA; 4196
IA; 4487
AR; 4563
CO; 5482
WI; 5685
MS; 5752
VA; 6079
MN; 6131
SC; 6479
AL; 6657
MD; 6837
CT; 6819
MO; 7134
LA; 8483
NC; 8586
TN; 8819
IN; 9693
OH; 10680
AZ; 12170
GA; 13246
MA; 14064
MI, 15181
PA; 20564
IL; 20645
NJ; 20934
FL; 25186
TX; 34971
CA; 36820

USA Total:
427 635

Per capita:

COVID-19 Deaths/100K population
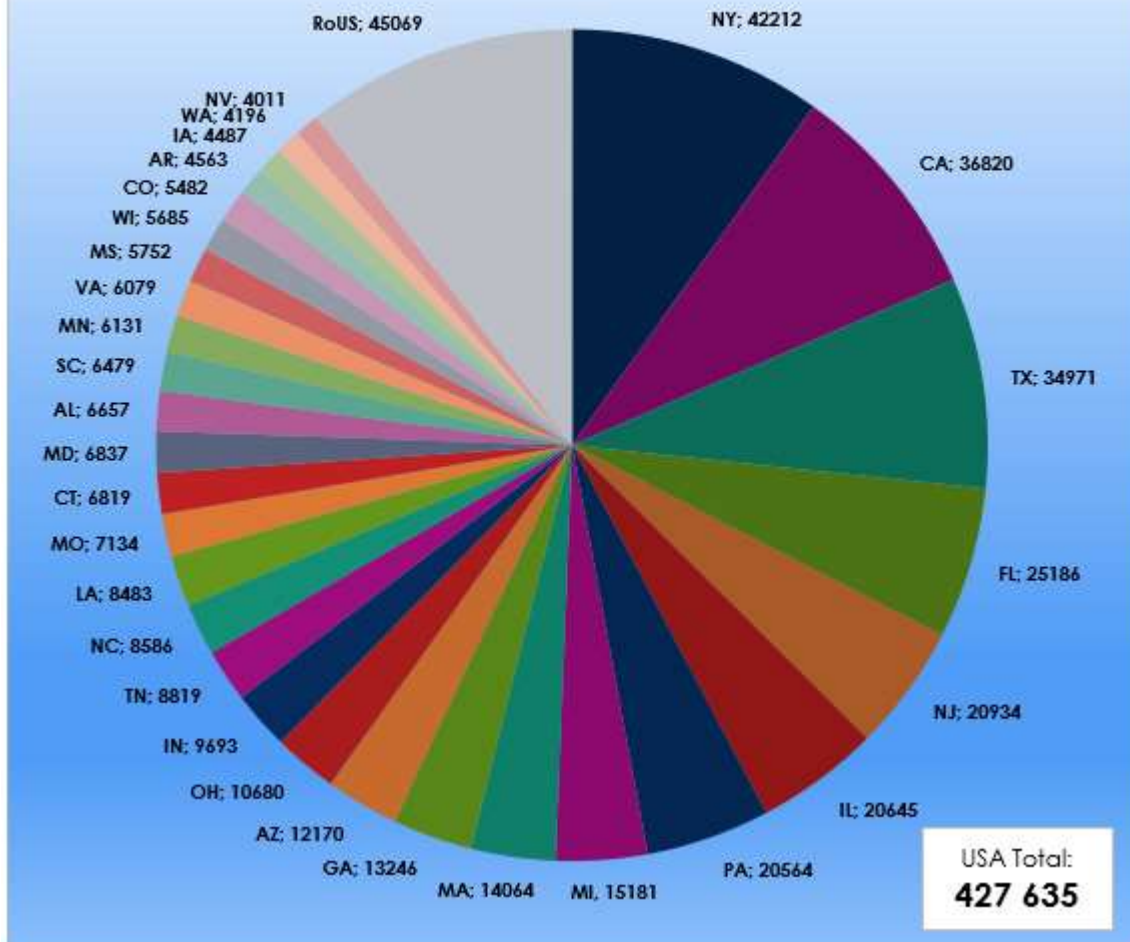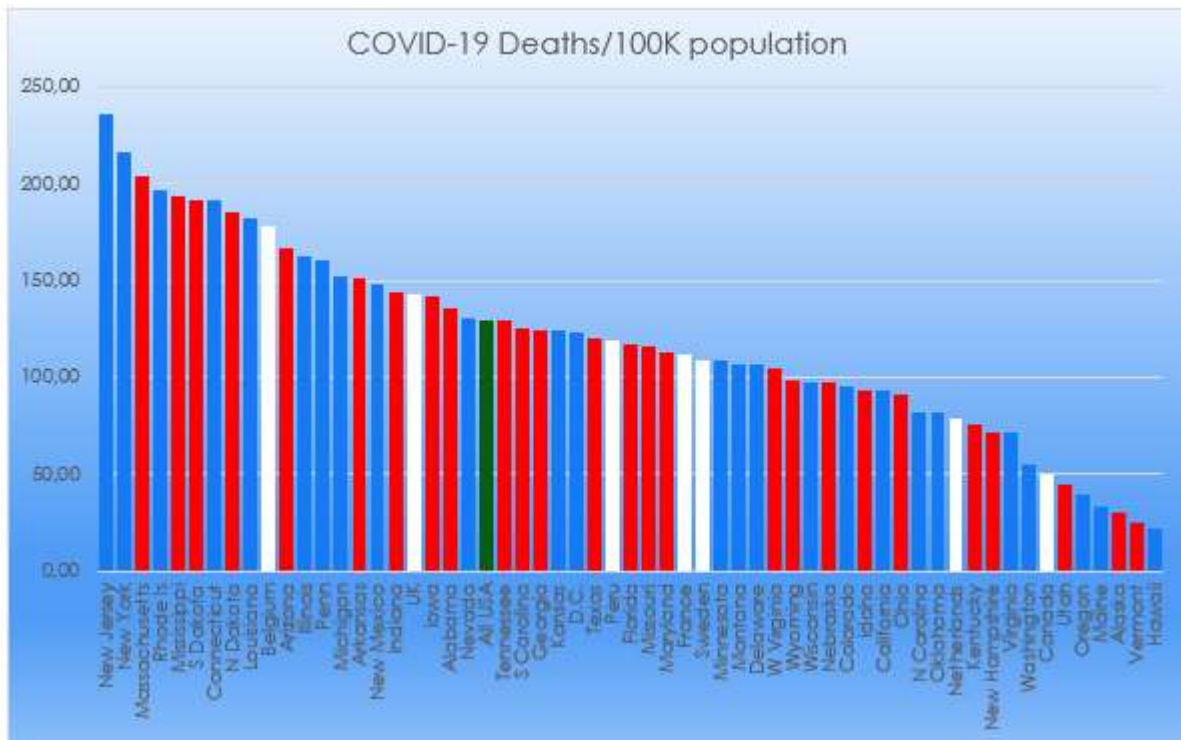
Moving left are: MS, AZ, SC, GA, KS, MT, WY, WI & CA. (again)

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)		
					23 Jan	19 Jan	16 Jan
AZ	20 Mar	309	04 Apr	294	48 days	76 days	38 days
CA	04 Mar	325	24 Mar	305	42 days	54 days	39 days
FL	06 Mar	323	27 Mar	302	97 days	97 days	89 days
GA	14 Mar	315	20 Mar	309	54 days	72 days	56 days
IA	24 Mar	305	15 Apr	283	94 days	162 days	101 days
IL	17 Mar	312	28 Mar	301	137 days	150 days	111 days
MA	20 Mar	309	29 Mar	300	137 days	142 days	126 days
MI	18 Mar	311	25 Mar	304	128 days	170 days	112 days
NJ	10 Mar	319	24 Mar	305	170 days	253 days	163 days
NY	14 Mar	315	20 Mar	309	137 days	147 days	136 days
PA	18 Mar	311	30 Mar	299	63 days	78 days	51 days
TX	16 Mar	313	30 Mar	299	62 days	79 days	64 days

- (compare 23/01 with 16/01 values [3]).
- Some improvement: AZ, CA, FL, IL, MA , MI, NJ & PA
- Net deterioration: IA.
- Poorest performance: CA then AZ, GA, TX, PA, IA & FL.

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

Doubling Time Evolution

(Log plot! – Remember longer doubling times are preferable.)
Over the weeks, the doubling times for the 12 states shown have been bunching together – the
range is currently from 42 (CA) to 170 (NJ). This gap more or less the same as a week ago.
(Previously – e.g., late July – a couple of orders of magnitude separated shortest & longest.)

NYC/LI status
Average daily death rates for the 5 boroughs & 2 counties:

NYC/LI: Daily COVID-19 Fatalities
(7-day moving means)
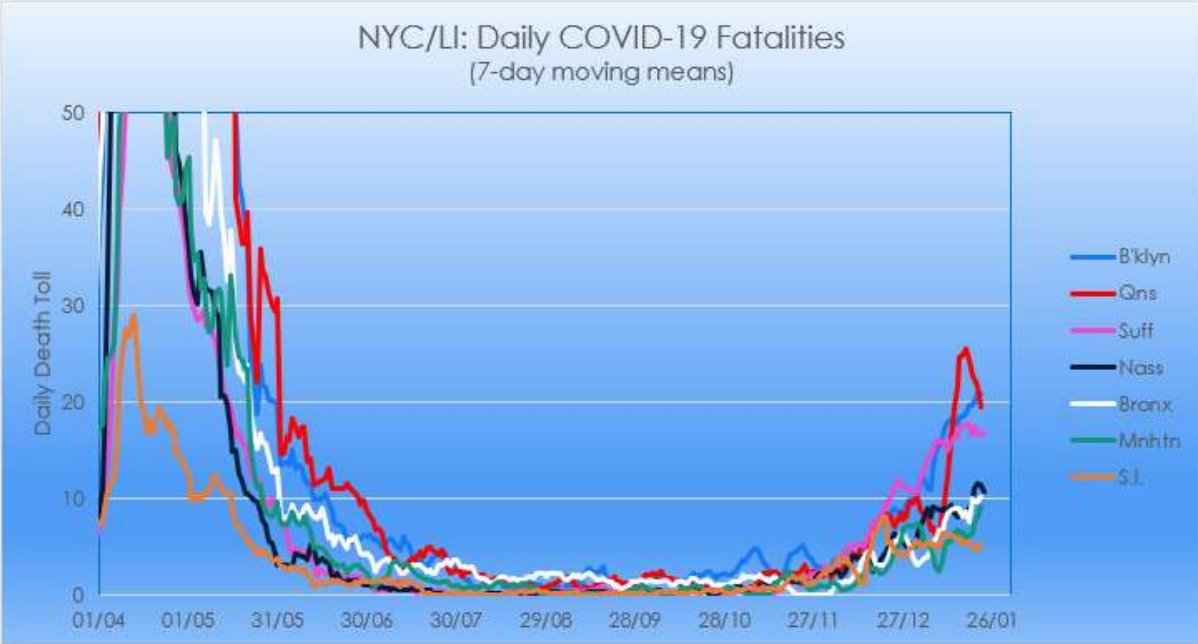
Brooklyn, Queens & Suffolk Co. have the worst figures.

Per-capita death tolls:

NYC & L.I. Deaths/100K population
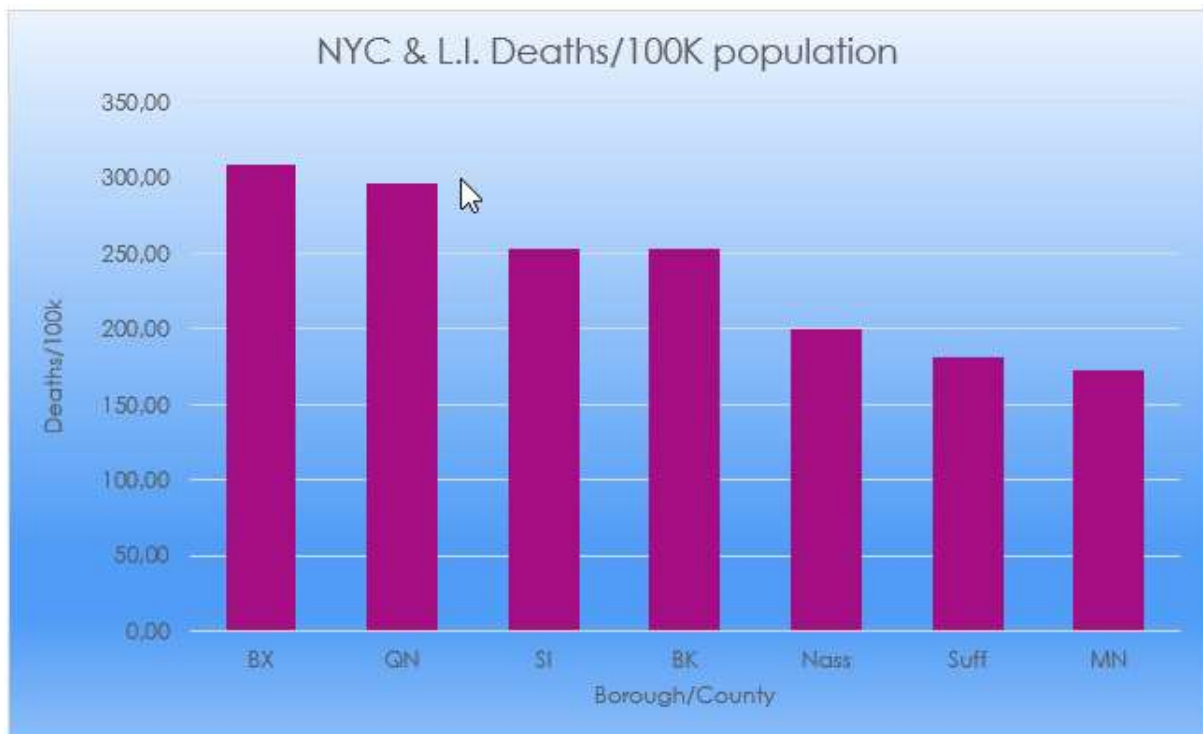
Next update on Wednesday.

Keep well, keep safe, keep isolated!

David

Snow… Started falling last night in **Jude & Stuart**'s garden in Birmingham:
(the UK, not the Alabama, one)

Quite a bit more this morning:

Enough for this - in a neighbour's garden!

The snow actually falling in **Lynda**'s garden in Tottenham at lunchtime today:

Don't hesitate to send me your images for this space…

Notes

[0] 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 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 only reported a single COVID-19 death since 17th May 2020! This occurred on 14th January 2021.
- Some countries, notably Sweden & Spain, regularly update the entire set of historical data provided to the website. Other counties, e.g., UK & USA, do the same but more rarely.

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

[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 <u>not the same</u> 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.)