# **COVID-19 Weekly Newsletter**

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<u>Contents</u>: Global overview / National comparisons / EU Test comparisons / Vaccinations / US States focus / NY Area update / Today's images: Northumbrian sunsets / [Notes]

## Global overview: [0]

Since last time:

- The global daily death rate has been rising since 30<sup>th</sup> Dec.
- The US accounts for a lot of the rise.
- Case rates in Europe are now slowing, especially in UK.



This is how deaths are distributed between the continents:

- Weekly deaths in Europe are dropping as a proportion 43% this week, down from 45% last week.
- The N. America share (read US share) has expanded from 28% to 30%.
- Unlike the previous week, more deaths occurred this week in S. America than in Africa.



Per-capita: Europe & N. America continue to catch up on S. America.

The growth rates of the European & N. American metrics are roughly equal this week, and growing almost 4x as fast as in S. America.



Note: These data represent the 124 countries with >1000 COVID-19 deaths. The other countries are not included in the figures.

### The Top 10 countries contributing to the global death toll over the past week are:

Top 10 Avg Daily Death Tolls					
USA	1 803				
Russia	748				
Poland	364				
India	329				
Italy	281				
UK	263				
Germany	227				
France	217				
Vietnam	195				
Turkey	156				
Top10	4 583				
World	7 302				
	63%				

US dominates. Turkey displaces S. Africa from the Top 10.

Cumulative death tolls for the top 30 countries [0]: <mark>N. America</mark>, <mark>S. America</mark>, <mark>Europe</mark>, <mark>Asia</mark>, <mark>Africa</mark>, <mark>Oceania</mark>

BG moves up the rankings:



Upward movement of rankings of other >1000-death countries: **GR**, **KR**, **ZM**, **UG**, **III**, **AU**, **RW** & **GH**. (<u>again</u>)

Per-capita death rates for all 124 countries with >1000 deaths: It's Europe & the Americas which dominate the first half of the plot:



Moving left: PL, US, LV, III, RU, ZA, NA, CH & BW. (again)

## The bottom half is mostly Asia, Africa & Central America:



# Moving left: DK, VN, NO, AU & MZ. (again)

## 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 rates continuing to rise, as are those in IT, UK, BR, ES & PT.
- Rates in IN, DE, FR & BE relatively flat recently.



#### Note on line graphs:

Please note that the key on the right of graphs like those above lists the entries in decreasing order of the value of the latest data points presented.

This applies to ALL line graphs in this newsletter.

<u>Tendencies: Comparison of time scales</u> [2] Double digits, triple+shortening. triple, quadruple

- Another week of deterioration. Only NL & DE improving.
- Worst case is now US.

This is how doubling times have been evolving since mid-June 2020:



(Log y scale. Remember: Shorter doubling times equate to a faster evolution of the disease.) **DE** & **NL** graphs rising; all the others dropping.

### EU Test Comparisons

**Warning**: National data on testing are not really comparable between countries, but do reveal trends in individual countries [6].

Change of scale in the following graph to show recent evolution more clearly: time axis runs from 1<sup>st</sup> June 2021.



(This is now a log plot!) Remarkable changes continue!

- UK rates are now falling rapidly.
- The rates of increase in other countries are slowing.
- FR has highest per-capita infection rates, followed by PT, ES & IT.

### This is how the infection rates translate into weekly per-capita hospital admissions:

Weekly new hospital admissions for COVID-19 per million people Weekly admissions refer to the cumulative number of new admissions over the previous week.



This is what the evolution in case rates looks like (absolute numbers, not per capita):



(Time axis: from 1<sup>st</sup> August 2020 to present.) Italy & Spain move ahead of Germany.

#### Vaccinations against COVID-19 [4]

Note: The denominator in the metrics displayed below 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).

59.9% of the world population has received at least one dose of a COVID-19 vaccine.

9.36 billion doses have been administered globally, and 32.69 million are now administered each day.

Only 9.5% of people in low-income countries have received at least one dose.

# Share of people vaccinated against COVID-19, Jan 15, 2022



Countries improving their position in the above graphic: PT, BR & UK.

#### COVID-19 vaccine boosters administered per 100 people

Our Worl in Data

Total number of vaccine booster doses administered, divided by the total population of the country. Booster doses are doses administered beyond those prescribed by the original vaccination protocol.



The share of daily COVID-19 tests that are positive



positive (last two - no change).

(P.S. My test on Friday was negative! I was alerted by FR contact-tracing app that I'd been in contact with an infected person.)

#### **US States Focus**

(Was Top 12 states by cumulative deaths, but TN has now entered the Top 12 displacing MA. Since I do not have TN historical data, we'll continue to monitor the original Top 12 only.) Comparative Daily Death Toll evolution





Comparative Daily Death Toll evolution over the past 30 days:



(Linear y scale) Rising rates for all 12 states, except FL. Particularly strong progression for NY & NJ.

The Top 10 states contributing to the national death toll over the past week are:

Top 10 Avg Daily Death Tolls						
New York	178					
Pennsylvania	138					
Illinois	125					
Ohio	121					
Michigan	108					
California	104					
Texas	99					
New Jersey	91					
Indiana	87					
Arizona	67					
Top10	1 051					
USA	1 945					
89 T 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	54%					

Same 10 states as last week, with changes in ranking.

Cumulative death toll for the top 33 US states: (Colours identify the party affiliation of the state Governors.) IN overtakes NC; MD & KY overtake NJ; CT overtakes AR:



Also moving up the rankings: NH

Note: The 50 states death toll is less than the USA death toll reported in the Global Overview.

This is because the latter figure includes US territories like Puerto Rico, Guam, the US Virgin Islands, the Northern Marianas as well as certain "federal" groups (Prisoners, Navajo nation, Veterans, ...).

Per capita (for all 50 states):



Moving left: TN, <u>PA</u>, <u>IN</u>, <u>NM</u>, <u>MO</u>, DE, ME & VT. (again) HI is now the state with the lowest per-capita death rate (was VT).

## Tendencies: Comparison of time scales [2]

Double digits, triple+shortening, triple, quadruple

State	1et doath	Days since	"Dav0"	Days since	Doubling time (7-day fits)					
State	ist deali	1st death	Dayu	"Day0"	15 Jan	08 Jan	01 Jan	25 Dec		
AZ	20 Mar 20	666	04 Apr 20	651	269 days	289 days	280 days	202 days		
CA	04 Mar 20	682	24 Mar 20	662	479 days	556 days	699 days	768 days		
FL	06 Mar 20	680	27 Mar 20	659						
GA	14 Mar 20	672	20 Mar 20	666	436 days	602 days	488 days	584 days		
IL	17 Mar 20	669	28 Mar 20	658	162 days	218 days	283 days	327 days		
MA	20 Mar 20	666	29 Mar 20	657	213 days	234 days	306 days	332 days		
MI	18 Mar 20	668	25 Mar 20	661	131 days	145 days	134 days	114 days		
NJ	10 Mar 20	676	24 Mar 20	662	191 days	294 days	556 days	780 days		
NY	14 Mar 20	672	20 Mar 20	666	202 days	316 days	406 days	562 days		
OH	18 Mar 20	668	31 Mar 20	655	156 days	190 days	139 days	170 days		
PA	18 Mar 20	668	30 Mar 20	656	158 days	156 days	191 days	171 days		
TX	16 Mar 20	670	30 Mar 20	656	474 days	538 days	690 days	834 days		

Note about FL: The reported data are very volatile and published day-to-day values keep changing erratically. Deterioration for all states, except PA. Worst case: Still MI.

This is how doubling time have been evolving since mid-June 2020:



(Log plot! – Remember, longer doubling times are preferable.) General decline in doubling times is possibly accelerating.

### NY Area update

Daily death rates rising sharply, esp. for Brooklyn & Queens:



Next update next Sunday (or, perhaps, next Monday).

Keep well & keep safe!

David



**Today's images:** Some superb sunset shots taken in a couple of Northumberland locations by **Judy**. 3 photos taken in & around Bamburgh:





2 photos taken on the Holy Island of Lindisfarne:





Please keep sending me your images for this space...

# <u>Notes</u>

[0] The national COVID-19 data are taken from the **worldometer** <u>website</u> 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 a single COVID-19 death since 17<sup>th</sup> May 2020! This occurred on 14<sup>th</sup> January 2021.
- Some countries, notably the US, regularly update the entire set of historical data provided to the website.

ISO 1	two-letter count	ry co	des used in this	Updat	e				
All	World	CR	Costa Rica	IQ	Iraq	MY	Malaysia	SN	Senegal
AE	UAE	CU	Cuba	IR	Iran	MZ	Mozambique	SO	Somalia
AF	Afghanistan	CZ	Czechia	IT	Italy	NA	Namibia	SR	Suriname
AL	Albania	DE	Germany	JM	Jamaica	NG	Nigeria	SV	El Salvador
AM	Armenia	DK	Denmark	JÖ	Jordan	NL	Netherlands	SY	Syria
AO	Angola	DO	Dominican Rep.	JP	Japan	NO	Norway	SZ	Eswatini
AR	Argentina	DZ	Algeria	KE	Kenya	NP	Nepal	TH	Thailand
AT	Austria	EC	Ecuador	KG	Kyrgyzstan	ÔM	Oman	TN	Tunisia
AU	Australia	EE	Estonia	KH	Cambodia	PA	Panama	TR	Turkey
AZ	Azerbaijan	EG	Egypt	KR	South Korea	PE	Peru	TT	Trinidad & Tobago
BA	Bosnia Herz.	ES	Spain	KW	Kuwait	PH	Philippines	UA	Ukraine
BD.	Bangladesh	ET	Ethiopia	KZ	Kazakhstan	PK	Pakistan	UG	Uganda
BE	Belgium	FI	Finland	LB	Lebanon	PL	Poland	UK	UK
BG	Bulgaria	FR	France	LK	Sri Lanka	PS	Palestine	US	USA
BH	Bahrain	GE	Georgia	LT	Lithuania	PT	Portugal	UY	Uruguay
BO	Bolivia	GH	Ghana	LV	Latvia	PY	Paraguay	UZ	Uzbekistan
BR	Brazil	GR	Greece	LY	Libya	RO	Romania	VE	Venezuela
BW	Botswana	GT	Guatemala	MA	Morocco	RoW	Rest of World	VN	Vietnam
BY	Belarus	GY	Guyana	MD	Moldova	RS	Serbia	YE	Yemen
CA	Canada	HN	Honduras	ME	Montenegro	RU	Russia	ZA	South Africa
CD	D.R. Congo	HR	Croatia	MG	Madagascar	RW	Rwanda	ZM	Zambia
CH	Switzerland	HU	Hungary	MK.	North Macedonia	SA	Saudi Arabia	ZW	Zimbabwe
CL	Chile	ID	Indonesia	MM	Myanmar	SD	Sudan		and the second second second
CM	Cameroon	IE	Ireland	MN	Mongolia	SE	Sweden		
CN	China	IL.	Israel	MW	Malawi	SI	Slovenia		
CO	Columbia	IN	India	MX	Mexico	SK	Slovakia		

US Sta	tes								
AL	Alabama	HI	Hawaii	ME	Maine	NJ	New Jersey	SD	South Dakota
AK	Alaska	IA.	lowa	MI	Michigan	NM	New Mexico	TN	Tennessee
AR	Arkansas	ID .	Idaho	MN	Minnesota	NV	Nevada	TX	Texas
AZ	Arizona	IL.	Illinois	MO	Missouri	NY	New York	UT	Utah
CA	Califormia	IN	Indiana	MS	Mississippi	OH		VA	Virginia
co	Colorado	KS	Kansas	MT	Montana	OK	Oklahoma	VT	Vermont
СТ	Connecticut	KY	Kentucky	NC	North Carolina	OR	Oregon	WA	Washington
DE	Delaware	LA	Louisiana	ND	North Dakota	PA	Pennsylvania	WI	Wisconsin
FL.	Florida	MA	Massachusetts	NE	Nebraska	RI	Rhode Island	WV	West Virginia
GA	Georgia	MD	Maryland	NH	New Hampshire	SC	South Carolina	WY	Wyoming
DC	Dist. of Columbia								

[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.

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.

[3] 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 <u>website</u>. (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 <u>here</u>.

[4] Vaccinations against COVID-19: These data are collected from official reports by the *Our World in Data* team and 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/group-death-by-boro.csv Source for Nassau & Suffolk counties: https://coronavirus.smartnews.com/us/new-york/

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