

COVID19 Time Series Analysis, Worldwide and U.S.

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Source data: 2019 Novel Coronavirus COVID-19 (2019-nCoV) Data Repository by Johns Hopkins CSSE;
<https://github.com/CSSEGISandData/COVID-19>

Source code: <https://github.com/opencedar/covid19>

The visualizations in this document are heavily indebted to Edward Tufte and his use of sparklines—small, clutter-free time series lines—to show how many different panels or categories of data are changing through time; check out https://www.edwardtufte.com/bboard/q-and-a-fetch-msg?msg_id=00010R.

Worldwide

Worldwide Summary

Sorted by total number of cases. Percent growth in total cases in the past seven days is last column.

Table 1: Worldwide Summary

Country_Region	days_100	conf	deaths	new_conf	conf_lag7	17_rate
US	32	243453	5926	30081	83836	192%
Italy	40	115242	13915	4668	80589	44%
Spain	32	112065	10348	7947	57786	92%
Germany	33	84794	1107	6922	43938	92%
China	72	82432	3322	71	81782	0%
France	34	59929	5398	2180	29551	104%
Iran	37	50468	3160	2875	29406	72%
United Kingdom	23	34173	2926	4308	11812	188%
Switzerland	29	18827	536	1059	11811	60%
Turkey	15	18135	356	2456	3629	400%
Belgium	28	15348	1011	1384	6235	148%
Netherlands	28	14788	1341	1092	7468	100%
Canada	23	11284	139	1724	4042	180%
Austria	26	11129	158	418	6909	60%
Korea, South	43	9976	169	89	9241	8%
Portugal	21	9034	209	783	3544	156%
Brazil	21	8044	324	1208	2985	168%
Israel	23	6857	36	765	2693	156%
Sweden	28	5568	308	621	2840	96%
Norway	28	5147	50	284	3369	52%
Australia	24	5116	24	254	2810	84%
Czechia	21	3858	44	350	1925	100%
Ireland	20	3849	98	402	1819	112%
Denmark	24	3573	123	283	2023	76%
Russia	17	3548	30	771	840	324%
Chile	18	3404	18	373	1306	160%
Ecuador	16	3163	120	415	1403	124%
Malaysia	25	3116	50	208	2031	52%
Poland	20	2946	57	392	1221	140%

Country_Region	days_100	conf	deaths	new_conf	conf_lag7	l7_rate
Romania	20	2738	115	278	1029	168%
Philippines	20	2633	107	322	707	272%
India	20	2543	72	545	727	248%
Japan	42	2495	62	317	1387	80%
Luxembourg	17	2487	30	168	1453	72%
Pakistan	18	2421	34	303	1201	100%
Saudi Arabia	20	1885	21	165	1012	88%
Thailand	19	1875	15	104	1045	80%
Indonesia	19	1790	170	113	893	100%
Greece	21	1544	53	129	892	72%
Finland	21	1518	19	72	958	60%
South Africa	16	1462	5	82	927	56%
Peru	17	1414	55	91	580	144%
Dominican Republic	13	1380	60	96	488	184%
Mexico	15	1378	37	163	475	192%
Iceland	22	1319	4	99	802	64%
Panama	15	1317	32	136	558	136%
Serbia	15	1171	31	111	384	204%
Colombia	15	1161	19	96	491	136%
Argentina	14	1133	36	79	502	124%
Singapore	34	1049	4	49	683	52%
United Arab Emirates	16	1024	8	210	333	208%
Croatia	15	1011	7	48	495	104%
World	24	988014	52299	78159	516866	92%

Ln (Seven-Day-Moving-Average New Cases) Impact on Ln (New Cases)

In other words, elasticity. How does this elasticity change through time, from days since the 100th case?

An elasticity under 1 indicates that over a seven-day period, new cases are decreasing.

The black line shows the best curve fit for elasticity changing over time. All countries generally are moving to cap the rate of exponential growth. Countries above the line are doing worse than average, and those below the line are doing better than average. A rate below 1 indicates that new cases are declining over an average 7-day period.

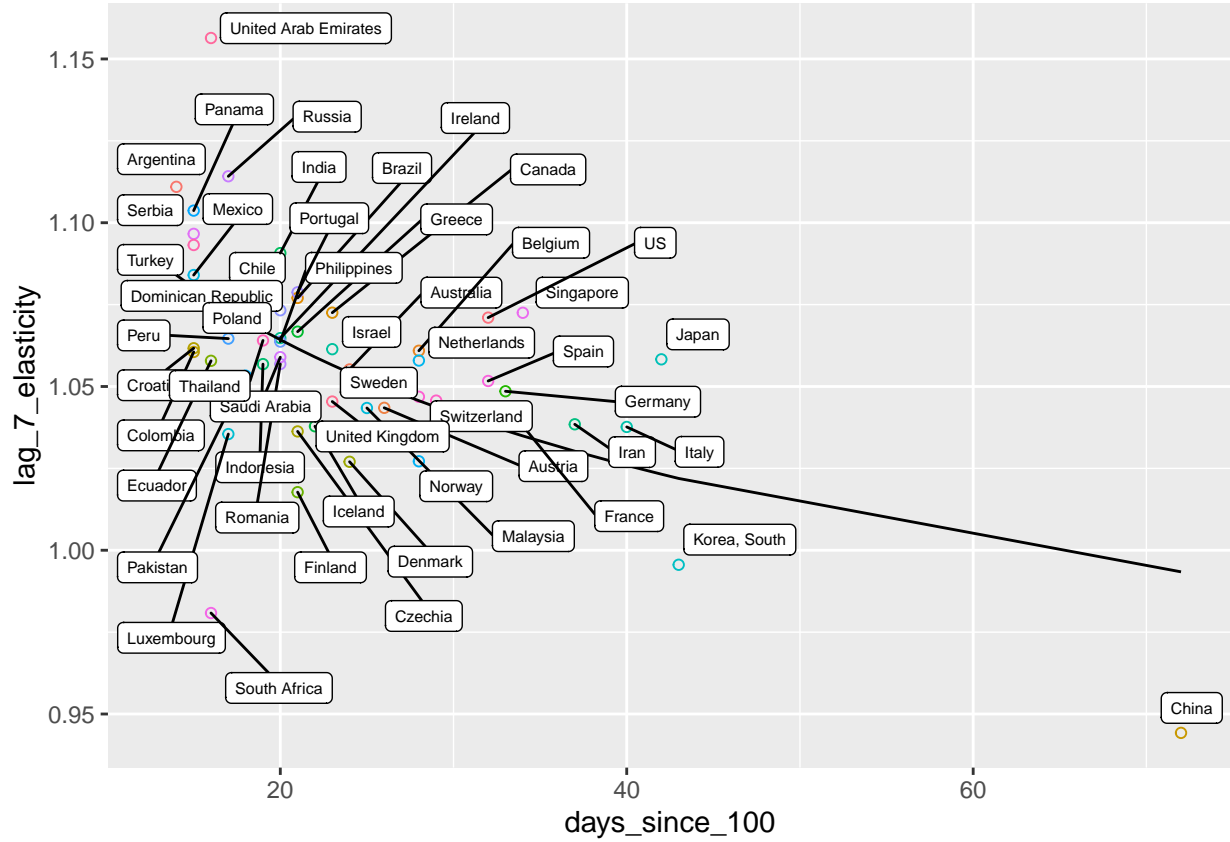


Table 2: Countries by Predicted vs. Actual Lag 7 New Case Elasticity on Today's Cases

country	days_since_100	lag_7_elasticity	prediction	residual
Dominican Republic	13	1.07	1.09	-0.01
Argentina	14	1.11	1.08	0.03
Colombia	15	1.06	1.08	-0.02
Croatia	15	1.06	1.08	-0.02
Mexico	15	1.08	1.08	0.00
Turkey	15	1.09	1.08	0.01
Serbia	15	1.10	1.08	0.02
Panama	15	1.10	1.08	0.02
South Africa	16	0.98	1.08	-0.10
Ecuador	16	1.06	1.08	-0.02
United Arab Emirates	16	1.16	1.08	0.08
Luxembourg	17	1.04	1.07	-0.04
Peru	17	1.06	1.07	-0.01
Russia	17	1.11	1.07	0.04
Pakistan	18	1.05	1.07	-0.02
Chile	18	1.08	1.07	0.01
Indonesia	19	1.06	1.07	-0.01
Thailand	19	1.06	1.07	0.00
Romania	20	1.06	1.06	-0.01
Saudi Arabia	20	1.06	1.06	-0.01
Philippines	20	1.06	1.06	0.00
Ireland	20	1.06	1.06	0.00

country	days_since_100	lag_7_elasticity	prediction	residual
Poland	20	1.07	1.06	0.01
India	20	1.09	1.06	0.03
Finland	21	1.02	1.06	-0.04
Czechia	21	1.04	1.06	-0.03
Greece	21	1.07	1.06	0.01
Brazil	21	1.08	1.06	0.02
Portugal	21	1.08	1.06	0.02
Iceland	22	1.04	1.06	-0.02
United Kingdom	23	1.05	1.06	-0.01
Israel	23	1.06	1.06	0.00
Canada	23	1.07	1.06	0.02
Denmark	24	1.03	1.05	-0.03
Australia	24	1.06	1.05	0.00
Malaysia	25	1.04	1.05	-0.01
Austria	26	1.04	1.05	-0.01
Norway	28	1.03	1.05	-0.02
Sweden	28	1.05	1.05	0.00
Netherlands	28	1.06	1.05	0.01
Belgium	28	1.06	1.05	0.02
Switzerland	29	1.05	1.04	0.00
Spain	32	1.05	1.04	0.01
US	32	1.07	1.04	0.03
Germany	33	1.05	1.04	0.01
France	34	1.04	1.03	0.00
Singapore	34	1.07	1.03	0.04
Iran	37	1.04	1.03	0.01
Italy	40	1.04	1.03	0.01
Japan	42	1.06	1.02	0.04
Korea, South	43	1.00	1.02	-0.03
China	72	0.94	0.99	-0.05

Comparisons with averages

Table 3: Countries by Predicted vs. Actual Lag 7 New Case Elasticity on Today's Cases

country	days_since_100	lag_7_elasticity	prediction	ww_residual
Dominican Republic	13	1.07	1.09	-0.01
Argentina	14	1.11	1.08	0.03
Colombia	15	1.06	1.08	-0.02
Croatia	15	1.06	1.08	-0.02
Mexico	15	1.08	1.08	0.00
Turkey	15	1.09	1.08	0.01
Serbia	15	1.10	1.08	0.02
Panama	15	1.10	1.08	0.02
South Africa	16	0.98	1.08	-0.10
Ecuador	16	1.06	1.08	-0.02
United Arab Emirates	16	1.16	1.08	0.08
Luxembourg	17	1.04	1.07	-0.04
Peru	17	1.06	1.07	-0.01
Russia	17	1.11	1.07	0.04

country	days_since_100	lag_7_elasticity	prediction	ww_residual
Pakistan	18	1.05	1.07	-0.02
Chile	18	1.08	1.07	0.01
Indonesia	19	1.06	1.07	-0.01
Thailand	19	1.06	1.07	0.00
Romania	20	1.06	1.06	-0.01
Saudi Arabia	20	1.06	1.06	-0.01
Philippines	20	1.06	1.06	0.00
Ireland	20	1.06	1.06	0.00
Poland	20	1.07	1.06	0.01
India	20	1.09	1.06	0.03
Finland	21	1.02	1.06	-0.04
Czechia	21	1.04	1.06	-0.03
Greece	21	1.07	1.06	0.01
Brazil	21	1.08	1.06	0.02
Portugal	21	1.08	1.06	0.02
Iceland	22	1.04	1.06	-0.02
United Kingdom	23	1.05	1.06	-0.01
Israel	23	1.06	1.06	0.00
Canada	23	1.07	1.06	0.02
Denmark	24	1.03	1.05	-0.03
Australia	24	1.06	1.05	0.00
Malaysia	25	1.04	1.05	-0.01
Austria	26	1.04	1.05	-0.01
Norway	28	1.03	1.05	-0.02
Sweden	28	1.05	1.05	0.00
Netherlands	28	1.06	1.05	0.01
Belgium	28	1.06	1.05	0.02
Switzerland	29	1.05	1.04	0.00
Spain	32	1.05	1.04	0.01
US	32	1.07	1.04	0.03
Germany	33	1.05	1.04	0.01
France	34	1.04	1.03	0.00
Singapore	34	1.07	1.03	0.04
Iran	37	1.04	1.03	0.01
Italy	40	1.04	1.03	0.01
Japan	42	1.06	1.02	0.04
Korea, South	43	1.00	1.02	-0.03
China	72	0.94	0.99	-0.05

Forecast New Cases by Country

We estimate new cases by date, to see when countries will peak, based on the worldwide curve fit.

Table 4: Forecast Peak New Cases by Country

country	total_cases	peak_new_cases	date	population	perc_pop_infected
China	83,050	15,133	2020-02-13	1,378,665,000	0.0%
Italy	259,622	6,557	2020-03-21	60,600,590	0.4%
Thailand	9,968	188	2020-03-22	68,863,514	0.0%
Switzerland	55,517	1,321	2020-03-23	8,372,098	0.7%
Saudi Arabia	9,904	205	2020-03-24	32,275,687	0.0%
Luxembourg	6,317	234	2020-03-25	582,972	1.1%

country	total_cases	peak_new_cases	date	population	perc_pop_infected
Austria	31,471	1,321	2020-03-26	8,747,358	0.4%
Malaysia	10,025	235	2020-03-26	31,187,265	0.0%
Indonesia	8,594	153	2020-03-27	261,115,456	0.0%
Norway	11,751	386	2020-03-27	5,232,929	0.2%
South Africa	2,503	243	2020-03-27	55,908,865	0.0%
Australia	22,108	497	2020-03-28	24,127,159	0.1%
Finland	3,531	126	2020-03-28	5,495,096	0.1%
Romania	15,382	363	2020-03-29	19,705,301	0.1%
Denmark	9,866	284	2020-03-31	5,731,118	0.2%
Dominican Republic	10,204	208	2020-03-31	10,648,791	0.1%
France	190,272	7,657	2020-03-31	66,896,109	0.3%
Philippines	22,595	538	2020-03-31	103,320,222	0.0%
Colombia	6,646	159	2020-04-01	48,653,419	0.0%
Croatia	4,952	96	2020-04-01	4,170,600	0.1%
Ecuador	16,364	508	2020-04-01	16,385,068	0.1%
Peru	9,765	258	2020-04-01	31,773,839	0.0%
United Kingdom	143,380	4,384	2020-04-01	65,637,239	0.2%
Iceland	3,968	99	2020-04-02	334,252	1.2%
Japan	21,875	317	2020-04-02	126,994,511	0.0%
Pakistan	11,184	303	2020-04-02	193,203,476	0.0%
Sweden	25,052	621	2020-04-02	9,903,122	0.3%
Germany	339,575	7,069	2020-04-09	82,667,685	0.4%
Spain	446,853	9,797	2020-04-10	46,443,959	1.0%
Israel	46,176	905	2020-04-15	8,547,100	0.5%
Ireland	22,736	413	2020-04-16	4,773,095	0.5%
Netherlands	78,524	1,424	2020-04-16	17,018,408	0.5%
Belgium	98,715	1,899	2020-04-17	11,348,159	0.9%
Greece	9,453	138	2020-04-18	10,746,740	0.1%
Poland	29,104	481	2020-04-22	37,948,016	0.1%
Mexico	15,854	253	2020-04-23	127,540,423	0.0%
Chile	36,592	622	2020-04-24	17,909,754	0.2%
Canada	139,959	2,587	2020-04-25	36,286,425	0.4%
Portugal	103,315	1,929	2020-04-25	10,324,611	1.0%
Brazil	123,925	2,188	2020-04-27	207,652,865	0.1%
US	4,253,823	93,651	2020-04-27	323,127,513	1.3%
Turkey	482,668	10,136	2020-04-29	79,512,426	0.6%
Serbia	22,402	335	2020-05-02	7,057,412	0.3%
Singapore	9,756	103	2020-05-05	5,607,283	0.2%
Panama	28,474	420	2020-05-08	4,034,119	0.7%
India	94,465	1,444	2020-05-09	1,324,171,354	0.0%
Argentina	36,301	496	2020-05-14	43,847,430	0.1%
United Arab Emirates	866,807	30,827	2020-05-17	9,269,612	9.4%

Forecast New Cases WW Total

WW Confirmed COVID19 Case Forecast as of 03 April 2020

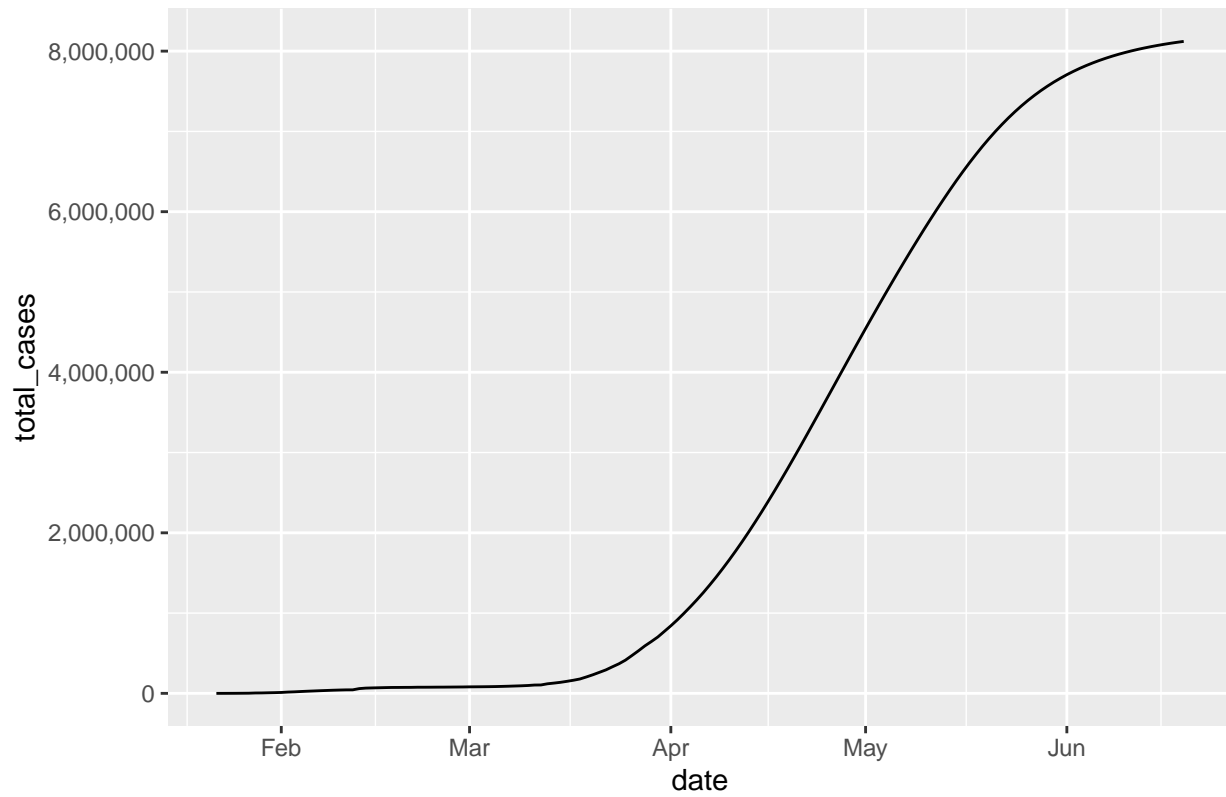
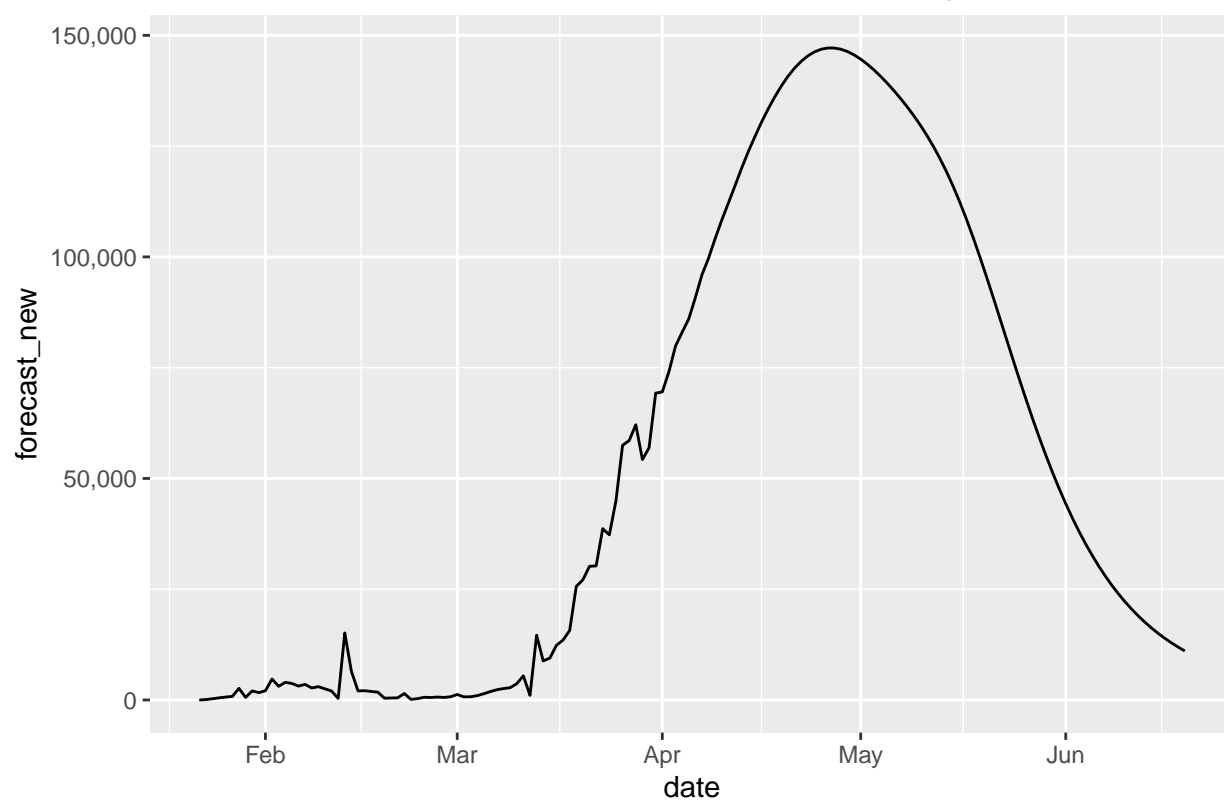


Table 5: Peak Daily New Cases Worldwide and Total on That Day

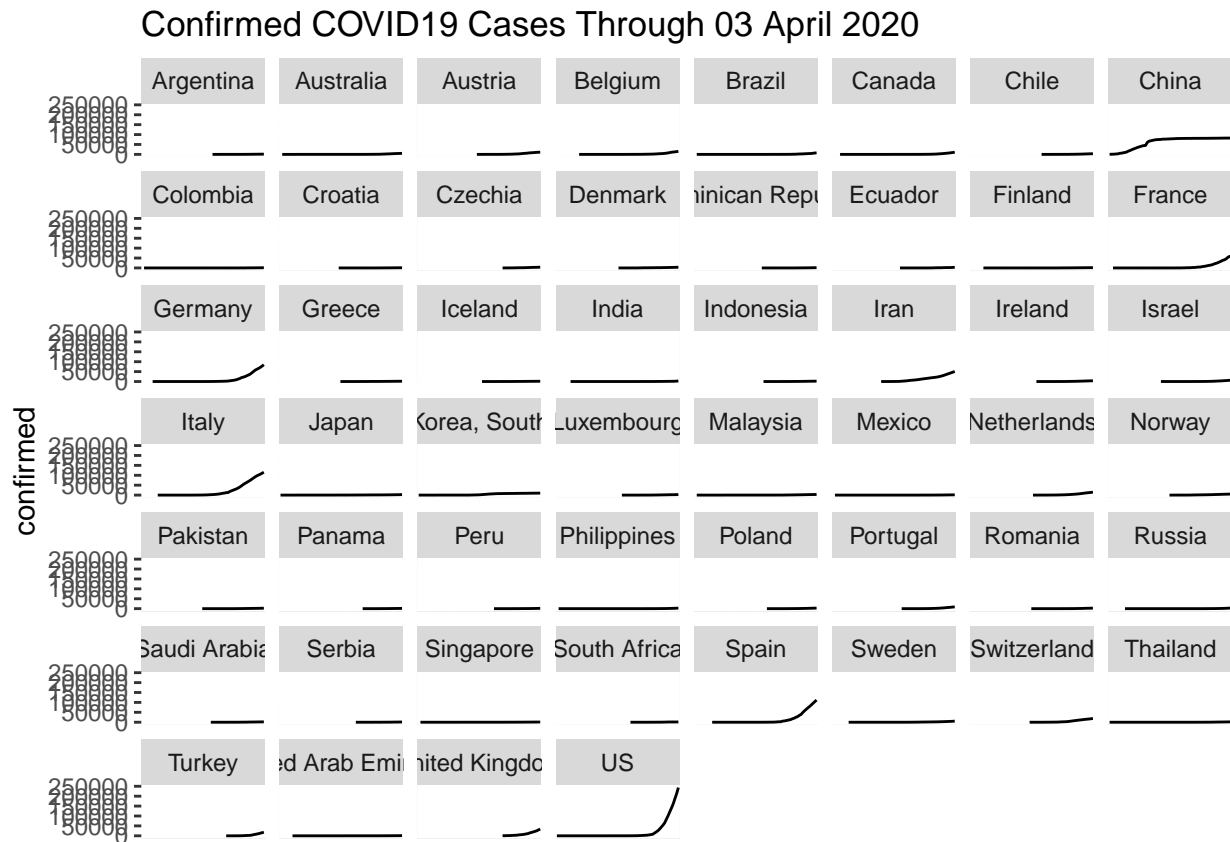
date	forecast_new	total_cases
2020-04-26	147,143	3,813,954

Worldwide New COVID19 Case Forecast as of 03 April 2020



Sparklines

Confirmed Cases



Deaths

Cumulative COVID19 Deaths Through 03 April 2020



Confirmed Growth Rate 5-Day Moving Average

5-Day MA Confirmed Growth Rate Through 03 April 2020



Death Rate

Death Rate Through 03 April 2020



U.S. Analysis

State Summary

Sorted by total number of cases. Percent growth in total cases in the past seven days is last column.

Table 6: State-by-State Summary

Province_State	days_100	conf	deaths	new_conf	conf_lag7	l7_rate
New York	26	92506	2373	8558	37877	144%
New Jersey	18	25590	537	3335	6876	272%
Michigan	15	10791	417	1476	2845	280%
California	25	10773	238	1374	3899	176%
Louisiana	18	9159	310	2735	2304	296%
Florida	19	9008	164	2052	2357	284%
Massachusetts	22	8966	154	1228	2417	272%
Illinois	18	7695	163	715	2538	204%
Pennsylvania	17	7268	90	1259	1795	304%
Washington	27	6389	271	781	3207	100%
Georgia	18	5348	163	710	1525	252%
Texas	17	5069	77	714	1563	224%
Connecticut	15	3824	112	267	1012	276%
Colorado	20	3342	80	360	1430	132%
Indiana	13	3038	78	474	645	372%
Ohio	15	2901	81	354	868	236%

Province_State	days_100	conf	deaths	new_conf	conf_lag7	l7_rate
Tennessee	15	2845	36	-88	1097	160%
Maryland	15	2331	36	345	583	300%
North Carolina	15	1977	21	302	738	168%
Missouri	11	1857	22	244	520	256%
Wisconsin	15	1748	38	192	728	140%
Arizona	13	1715	32	185	508	236%
Virginia	14	1706	41	223	466	268%
South Carolina	14	1554	31	261	424	268%
Nevada	14	1463	38	184	420	248%
Alabama	13	1233	32	173	517	140%
Mississippi	13	1177	26	104	485	144%
Utah	13	1092	7	204	396	176%
Oklahoma	10	881	34	160	248	256%
Oregon	14	826	21	90	316	160%
Idaho	8	776	9	210	146	432%
Kentucky	12	770	31	138	247	212%
Minnesota	14	742	18	53	344	116%
Rhode Island	11	657	12	91	165	300%
District of Columbia	12	653	12	67	231	184%
Arkansas	13	643	12	59	335	92%
Iowa	11	614	11	67	179	244%
Kansas	10	553	12	68	172	220%
Delaware	10	393	12	25	130	204%
New Mexico	10	388	6	48	113	244%
Maine	11	376	7	73	155	144%
Vermont	9	338	17	17	158	112%
New Hampshire	11	316	3	-51	137	132%
Puerto Rico	6	316	12	30	64	392%
Hawaii	7	256	1	32	95	168%
Nebraska	5	246	5	36	74	232%
Montana	7	241	6	33	90	168%
West Virginia	5	216	2	25	52	316%
South Dakota	4	165	2	36	46	260%
North Dakota	4	159	3	17	51	212%
Wyoming	3	150	0	20	53	184%
Alaska	5	143	3	11	56	156%
US	13	243183	5919	30076	83697	192%

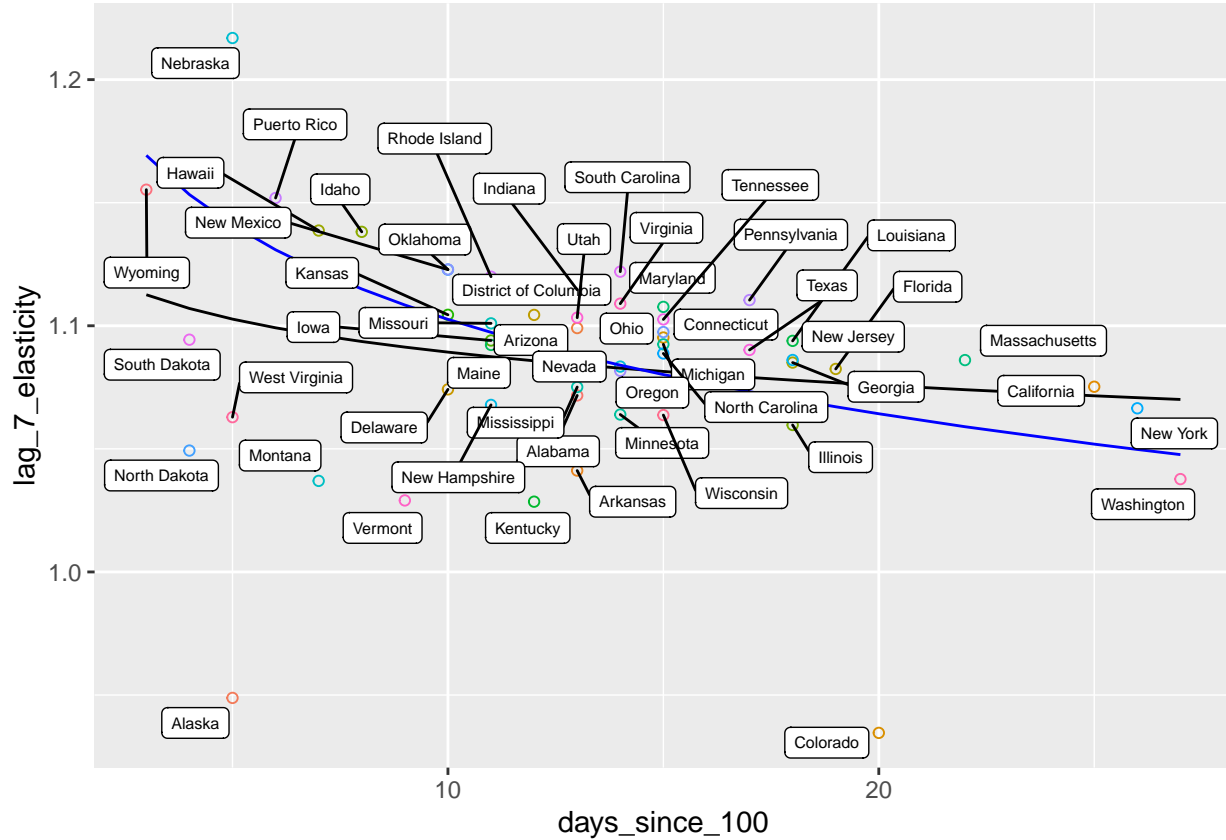
Ln (Seven-Day-Moving-Average New Cases) Impact on Ln (New Cases)

In other words, elasticity. How does this elasticity change through time, from days since the 50th case?

An elasticity under 1 indicates that over a seven-day period, new cases are decreasing.

The black line is the best fit for elasticity for the states that have had 100 cases as they progress. Above the line: worse than average; below-the-line: better than average.

The blue line is the best fit for elasticity for countries across the world. It's apparent that the U.S. is not doing as well as the rest of the world in containing exponential growth—probably due to initial testing failures.



Comparisons with U.S. and worldwide averages

Some states are doing better than worldwide averages when taking into account days since 100th case. Most are doing worse.

Table 7: States by Predicted vs. Actual Lag 7 New Case Elasticity on Today's Cases

state	days_since_100	lag_7_elasticity	prediction_us	prediction_ww	us_residual	ww_residual
Wyoming	3	1.16	1.11	1.17	0.04	-0.01
North Dakota	4	1.05	1.11	1.15	-0.06	-0.10
South Dakota	4	1.09	1.11	1.15	-0.01	-0.06
Alaska	5	0.95	1.10	1.14	-0.15	-0.19
West Virginia	5	1.06	1.10	1.14	-0.04	-0.08
Nebraska	5	1.22	1.10	1.14	0.11	0.08
Puerto Rico	6	1.15	1.10	1.13	0.05	0.02
Montana	7	1.04	1.10	1.12	-0.06	-0.09
Hawaii	7	1.14	1.10	1.12	0.04	0.02
Idaho	8	1.14	1.09	1.11	0.04	0.02
Vermont	9	1.03	1.09	1.11	-0.06	-0.08
Delaware	10	1.07	1.09	1.10	-0.02	-0.03
Kansas	10	1.10	1.09	1.10	0.02	0.00
New Mexico	10	1.12	1.09	1.10	0.03	0.02
Oklahoma	10	1.12	1.09	1.10	0.03	0.02
New Hampshire	11	1.07	1.09	1.10	-0.02	-0.03
Maine	11	1.09	1.09	1.10	0.00	-0.01
Iowa	11	1.09	1.09	1.10	0.01	0.00

state	days_since_100	lag_7_elasticity	prediction_us	prediction_ww	us_residual	ww_residual
Missouri	11	1.10	1.09	1.10	0.01	0.00
Rhode Island	11	1.12	1.09	1.10	0.03	0.02
Kentucky	12	1.03	1.09	1.09	-0.06	-0.06
District of Columbia	12	1.10	1.09	1.09	0.02	0.01
Arkansas	13	1.04	1.08	1.09	-0.04	-0.05
Alabama	13	1.07	1.08	1.09	-0.01	-0.02
Mississippi	13	1.08	1.08	1.09	-0.01	-0.01
Arizona	13	1.10	1.08	1.09	0.01	0.01
Utah	13	1.10	1.08	1.09	0.02	0.02
Indiana	13	1.11	1.08	1.09	0.03	0.03
Minnesota	14	1.06	1.08	1.08	-0.02	-0.02
Oregon	14	1.08	1.08	1.08	0.00	0.00
Nevada	14	1.08	1.08	1.08	0.00	0.00
Virginia	14	1.11	1.08	1.08	0.03	0.02
South Carolina	14	1.12	1.08	1.08	0.04	0.04
Wisconsin	15	1.06	1.08	1.08	-0.02	-0.02
North Carolina	15	1.09	1.08	1.08	0.01	0.01
Michigan	15	1.09	1.08	1.08	0.01	0.01
Connecticut	15	1.10	1.08	1.08	0.01	0.02
Ohio	15	1.10	1.08	1.08	0.02	0.02
Tennessee	15	1.10	1.08	1.08	0.02	0.02
Maryland	15	1.11	1.08	1.08	0.03	0.03
Texas	17	1.09	1.08	1.07	0.01	0.02
Pennsylvania	17	1.11	1.08	1.07	0.03	0.04
Illinois	18	1.06	1.08	1.07	-0.02	-0.01
Georgia	18	1.09	1.08	1.07	0.01	0.01
New Jersey	18	1.09	1.08	1.07	0.01	0.02
Louisiana	18	1.09	1.08	1.07	0.02	0.02
Florida	19	1.08	1.08	1.07	0.01	0.02
Colorado	20	0.93	1.08	1.06	-0.14	-0.13
Massachusetts	22	1.09	1.07	1.06	0.01	0.03
California	25	1.08	1.07	1.05	0.00	0.02
New York	26	1.07	1.07	1.05	0.00	0.02
Washington	27	1.04	1.07	1.05	-0.03	-0.01

Forecast New Cases by State

We estimate new cases by date, to see when states will peak, based on the worldwide curve fit. The reasoning is that testing rates increasing wildly recently in the U.S. have falsely inflated elasticity.

Table 8: Forecast Peak New Cases by State

state	total_cases	total_deaths	peak_new_cases	peak_new_deaths	max_new_date	max_death
Arkansas	2,684	107	61	2	2020-03-25	2020-03-25
New Hampshire	1,701	68	100	4	2020-03-30	2020-03-30
Colorado	5,479	219	655	26	2020-03-31	2020-03-31
Delaware	3,122	125	55	2	2020-03-31	2020-03-31
Kentucky	3,147	126	149	6	2020-03-31	2020-03-31
Vermont	1,215	48	37	1	2020-03-31	2020-03-31
Alabama	10,087	403	173	7	2020-04-02	2020-04-02
Maine	4,856	194	73	3	2020-04-02	2020-04-02
Washington	26,984	1,079	781	31	2020-04-02	2020-04-02

state	total_cases	total_deaths	peak_new_cases	peak_new_deaths	max_new_date	max_death
Minnesota	4,881	195	77	3	2020-04-15	2020
Wisconsin	12,242	489	216	9	2020-04-16	2020
Illinois	61,604	2,464	1,273	51	2020-04-17	2020
New York	683,669	27,346	17,881	715	2020-04-17	2020
Mississippi	10,458	418	174	7	2020-04-19	2020
New Jersey	392,997	15,720	11,036	441	2020-04-21	2020
Louisiana	233,796	9,352	6,380	255	2020-04-25	2020
Oregon	9,877	395	145	6	2020-04-25	2020
Nevada	21,981	879	374	15	2020-04-26	2020
Iowa	10,154	406	153	6	2020-04-27	2020
Michigan	280,931	11,237	6,685	267	2020-04-28	2020
Connecticut	99,053	3,962	2,073	83	2020-04-30	2020
Massachusetts	239,373	9,575	5,417	217	2020-04-30	2020
District of Columbia	14,596	584	239	10	2020-05-02	2020
Florida	274,158	10,966	5,426	217	2020-05-02	2020
Georgia	150,433	6,017	2,877	115	2020-05-03	2020
Missouri	51,681	2,067	922	37	2020-05-03	2020
Kansas	12,024	481	177	7	2020-05-04	2020
North Carolina	44,557	1,782	714	29	2020-05-04	2020
Pennsylvania	691,982	27,679	19,433	777	2020-05-05	2020
Arizona	55,438	2,217	924	37	2020-05-07	2020
California	332,132	13,284	5,801	232	2020-05-07	2020
Indiana	239,149	9,566	5,440	218	2020-05-08	2020
Idaho	64,365	2,574	1,365	55	2020-05-09	2020
Texas	209,849	8,393	3,706	148	2020-05-09	2020
Utah	33,234	1,329	519	21	2020-05-09	2020
Ohio	124,458	4,978	2,164	87	2020-05-10	2020
Rhode Island	32,159	1,286	574	23	2020-05-10	2020
Maryland	165,899	6,635	3,297	132	2020-05-11	2020
Tennessee	123,296	4,931	2,236	89	2020-05-11	2020
Oklahoma	64,667	2,586	1,100	44	2020-05-15	2020
South Carolina	208,032	8,321	4,627	185	2020-05-15	2020
Virginia	135,102	5,403	2,354	94	2020-05-16	2020
New Mexico	19,639	785	269	11	2020-05-17	2020

Forecast New Cases U.S. Total

U.S. Confirmed COVID19 Case Forecast as of 03 April 2020

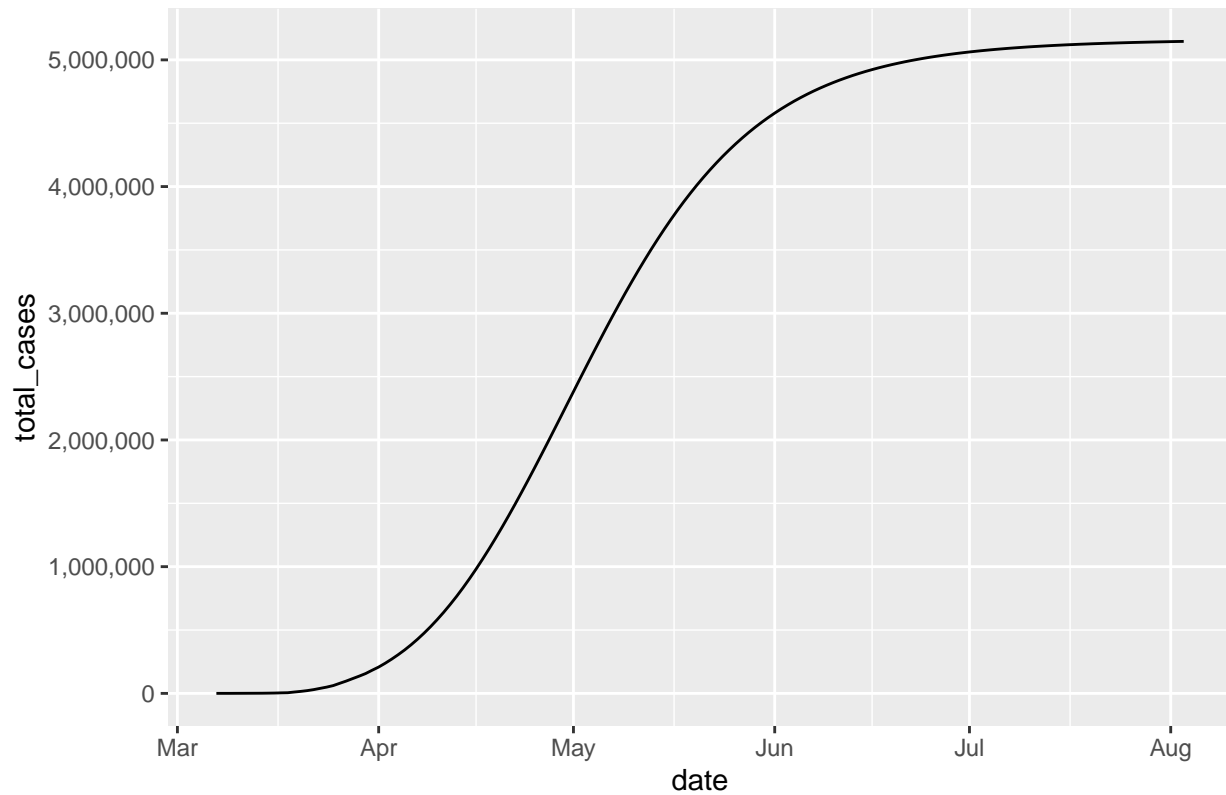


Table 9: Peak Daily New Cases in U.S. and Total on That Day

date	forecast_new	deaths_new	total_cases	total_deaths
2020-05-01	101,368	4020.8	2,381,330	83100.8

U.S. New COVID19 Case Forecast as of 03 April 2020

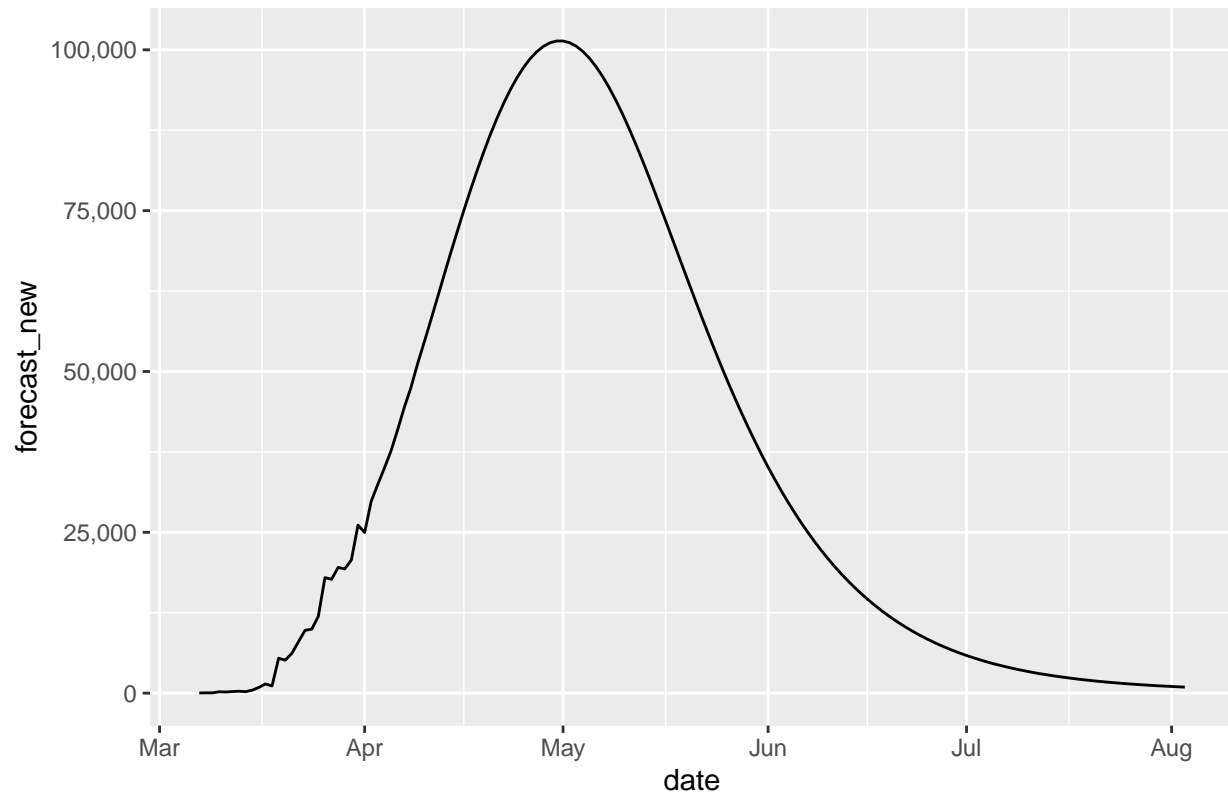
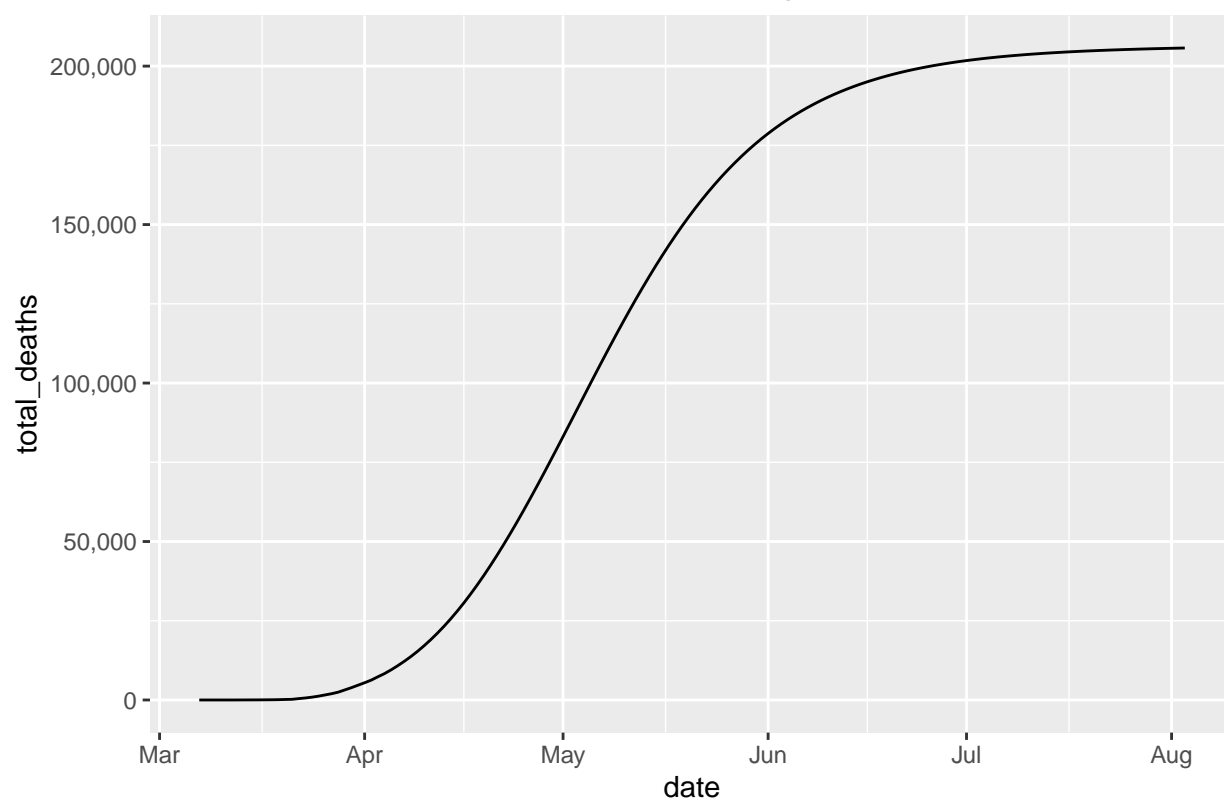


Table 10: Peak Daily Deaths in U.S. and Total on That Day

date	forecast_new	deaths_new	total_cases	total_deaths
2020-05-04	99741	4,055	2,682,717	95253.2

U.S. COVID19 Death Forecast as of 03 April 2020



Sparklines

We only look at states with more than one hundred cases today. For moving average growth rates, we only look at states with deaths and recoveries over 25.

Confirmed Cases

Confirmed COVID19 Cases Through 03 April 2020



Deaths

Cumulative COVID19 Deaths Through 03 April 2020



Confirmed Growth Rate 5-Day Moving Average

Confirmed Growth Rate Through 03-1 April 2020



Death Rate 5-Day Moving Average

Only states with >25 deaths are shown

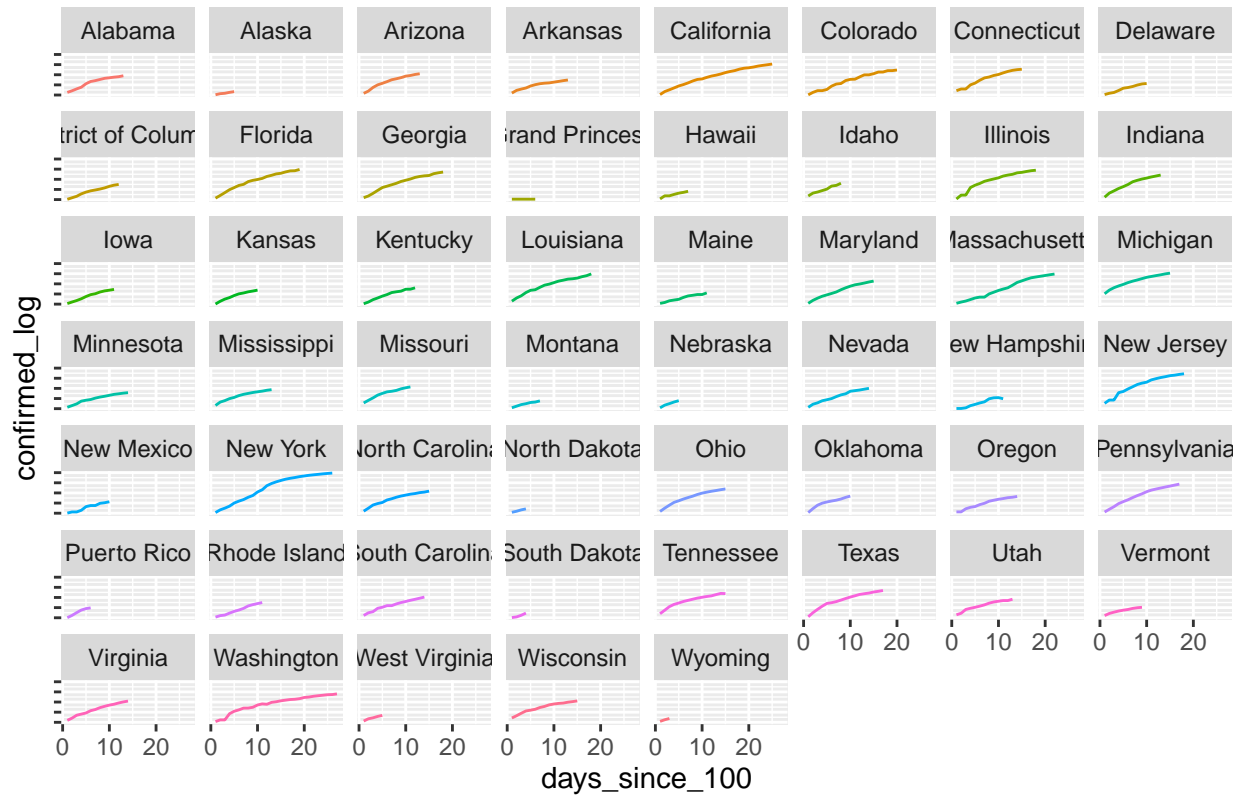
Death Rate Through 03-1 April 2020



Log / Time for States After 100th Case

Log-10 by States: Confirmed Cases by Day After 50th Confirmed Case

Log-10 of Confirmed Cases Since 100th Case by State as of 03 April 2020



Zero at Fifty Cases

Confirmed Cases

Confirmed COVID19 Cases by State Through 03 April 2020

