4-5-2020

A Data Scientist Looks at Covid-19 Part I: Local and National Statistics

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Part I: Local and National Statistics

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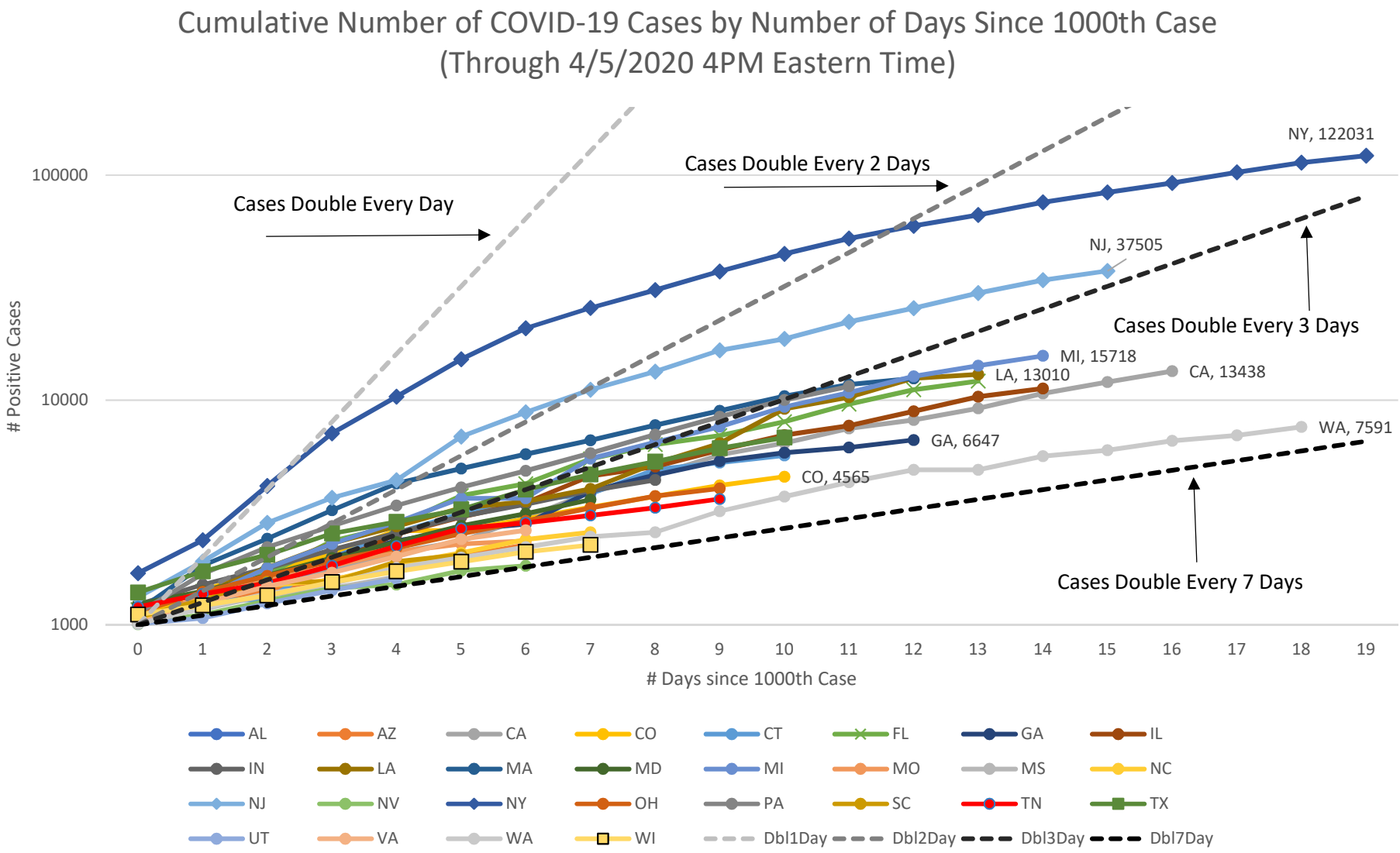
Why?

- I was curious to see if the curve was flattening in certain states and couldn't find what I wanted
- So I found the raw data and created the following figures
- State data is current as of 4pm 4/5/2020
- It comes from https://covidtracking.com/about-tracker/ which is a site that aggregates data from each state health authority
- NJ County data is from https://www.insidernj.com/insidernj-covid19-information-update-center/ as of 1pm 4/5/2020 and confirmed with http://www.covid19.nj.gov at 4/5/2020 3pm

The News is dire, but is there any good news?

- US totals and NY, NJ are bad… but the rate of growth is decreasing

- The next graph shows evidence of "**flattening-the-curve**" in all of the states with large outbreaks


Cumulative Number of COVID-19 Cases by Number of Days Since 1000th Case
(Through 4/5/2020 4PM Eastern Time)
Cases Double Every Day
Cases Double Every 2 Days
Cases Double Every 3 Days
Cases Double Every 7 Days
NY, 122031
NJ, 37505
MI, 15718
LA, 13010
CA, 13438
GA, 6647
CO, 4565
WA, 7591
100000
10000
1000
Positive Cases
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19
Days since 1000th Case
AL AZ CA CO CT FL GA IL
IN LA MA MD MI MO MS NC
NJ NV NY OH PA SC TN TX
UT VA WA WI Dbl1Day Dbl2Day Dbl3Day Dbl7Day

Next Slide is Hard to read, but Shows Growth is Slowing in Every State

- Red is bad; blue is good.
- NY Cases are doubling every 7 days. Two weeks ago they were doubling every 1.6 days.
- NJ Cases are doubling every 5.4 days compared with every 2.2 days two weeks ago. (Note this still means 75,000 cases by next weekend unless more progress is made)
- Pennsylvania cases are growing faster than the rest of the country
- Delaware has few cases but is not significantly reducing its growth
- Oregon is doing the best of any state in terms of reducing growth

Cumulative Positive Cases of COVID-19 by State

State	19-Mar	20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar	27-Mar	28-Mar	29-Mar	30-Mar	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr	State	Current Growth: 1 Day Growth Rate	Current Growth: 3 Day Growth Rate	Current Growth: Cases Double Every N Days	1 Week Ago: 1 Day Growth Rate	1 Week Ago: 3 Day Growth Rate	1 Week Ago: Cases Double Every N Days	2 Weeks Ago: 1 Day Growth Rate	2 Weeks Ago: 3 Day Growth Rate	2 Weeks Ago: Cases Double Every N Days
All US*	11719	17033	23197	31879	42152	51954	63928	80735	99413	118234	139061	160530	184683	210816	239099	271988	305755	332308	All US*	8.7%	11.6%	6.3	17.6%	19.9%	3.8	37.4%	39.6%	2.1
NY	4152	7102	10356	15168	20875	25665	30811	37258	44635	52318	59513	66497	75795	83712	92381	102863	113704	122031	NY	7.3%	9.7%	7.5	13.8%	16.9%	4.4	46.5%	54.0%	1.6
NJ	742	890	1327	1914	2844	3675	4402	6876	8825	11124	13386	16636	18696	22255	25590	29895	34124	37505	NJ	9.9%	13.6%	5.4	20.3%	24.9%	3.1	44.2%	37.1%	2.2
MI	336	549	787	1035	1328	1791	2294	2856	3657	3657	5486	6498	7615	9334	10791	12744	14225	15718	MI	10.5%	13.4%	5.5	50.0%	24.3%	3.2	31.5%	45.5%	1.8
CA	924	1063	1279	1536	1733	2102	2355	3006	3879	4643	5708	6447	7482	8155	9191	10701	12026	13438	CA	11.7%	13.5%	5.5	22.9%	23.8%	3.2	20.1%	18.5%	4.1
LA	347	479	585	837	1172	1388	1795	2305	2746	3315	3540	4025	5237	6424	9150	10297	12496	13010	LA	4.1%	12.4%	5.9	6.8%	15.4%	4.8	43.1%	34.1%	2.4
MA	328	413	525	646	777	1159	1838	2417	3240	4257	4955	5752	6620	7738	8966	10402	11736	12500	MA	6.5%	11.7%	6.3	16.4%	27.0%	2.9	23.0%	25.3%	3.1
FL	390	520	658	830	1171	1412	1682	2355	2765	3763	4246	5473	6338	6955	8010	9585	11111	12151	FL	9.4%	14.9%	5.0	12.8%	21.7%	3.5	26.1%	28.6%	2.8
PA	185	268	371	479	644	851	1127	1687	2218	2751	3394	4087	4843	5805	7016	8420	10017	11510	PA	14.9%	17.9%	4.2	23.4%	26.2%	3.0	29.1%	37.3%	2.2
IL	422	585	753	1049	1273	1535	1865	2538	3026	3491	4596	5057	5994	6980	7695	8904	10357	11256	IL	8.7%	13.5%	5.5	31.7%	21.9%	3.5	39.3%	35.5%	2.3
WA	1187	1376	1524	1793	1996	2221	2469	2580	3207	3723	4310	4896	4896	5634	5984	6585	6966	7591	WA	9.0%	8.3%	8.7	15.8%	18.7%	4.1	17.7%	14.7%	5.0
TX	143	194	304	334	352	410	974	1396	1731	2052	2552	2877	3266	3997	4669	5330	6110	6812	TX	11.5%	13.4%	5.5	24.4%	22.3%	3.4	9.9%	32.7%	2.5
GA	287	420	507	600	772	1026	1247	1525	2001	2366	2651	2809	3929	4638	5348	5831	6160	6647	GA	7.9%	7.5%	9.6	12.0%	20.2%	3.8	18.3%	27.9%	2.8
CT	96	194	194	223	415	618	875	1012	1291	1291	1993	2571	3128	3557	3824	4914	5276	5675	CT	7.6%	14.1%	5.3	54.4%	25.3%	3.1	14.9%	32.4%	2.5
CO	216	277	363	475	591	720	912	1086	1430	1734	2061	2627	2627	2966	3342	3728	4173	4565	CO	9.4%	11.0%	6.7	18.9%	23.8%	3.2	30.9%	30.0%	2.6
IN	56	79	126	201	259	365	477	645	981	1232	1514	1786	2159	2565	3039	3437	3953	4411	IN	11.6%	13.2%	5.6	22.9%	32.9%	2.4	59.5%	53.1%	1.6
OH	119	169	247	351	442	564	704	867	1137	1406	1653	1933	2199	2547	2902	3312	3739	4043	OH	8.1%	11.7%	6.3	17.6%	24.0%	3.2	42.1%	43.4%	1.9
TN	154	228	371	505	615	667	784	957	1203	1373	1537	1834	2239	2683	2845	3067	3321	3633	TN	9.4%	8.5%	8.5	11.9%	17.1%	4.4	36.1%	48.6%	1.8
MD	107	149	190	244	288	349	423	580	774	992	1239	1413	1660	1985	2331	2758	3125	3609	MD	15.5%	15.7%	4.8	24.9%	28.8%	2.7	28.4%	31.6%	2.5
VA	94	114	152	219	254	290	391	460	604	739	890	1020	1250	1484	1706	2012	2407	2637	VA	9.6%	15.6%	4.8	20.4%	24.6%	3.2	44.1%	32.6%	2.5
NC	97	137	184	255	297	398	504	636	763	935	1040	1307	1498	1584	1857	2093	2402	2585	NC	7.6%	11.7%	6.3	11.2%	17.8%	4.2	38.6%	38.0%	2.2
MO	24	47	73	90	183	183	356	502	669	838	838	1031	1327	1581	1834	2113	2291	2367	MO	3.3%	8.9%	8.2	0.0%	18.6%	4.1	23.3%	55.4%	1.6
AZ	44	65	104	152	265	357	450	577	736	873	919	1157	1289	1413	1598	1769	2019	2269	AZ	12.4%	12.4%	5.9	5.3%	16.8%	4.5	46.2%	51.2%	1.7
WI	155	206	281	385	416	457	585	707	842	989	1112	1221	1351	1550	1730	1912	2112	2267	WI	7.3%	9.4%	7.7	12.4%	16.3%	4.6	37.0%	35.4%	2.3
SC	60	81	152	195	299	298	424	456	456	539	774	925	1083	1293	1554	1554	1917	2049	SC	6.9%	9.7%	7.5	43.6%	19.3%	3.9	28.3%	48.1%	1.8
NV	95	109	124	190	245	278	321	420	535	621	738	1008	1113	1279	1458	1514	1742	1836	NV	5.4%	8.0%	9.0	18.8%	20.7%	3.7	53.2%	26.0%	3.0
AL	68	81	124	138	167	215	283	506	587	696	806	859	981	1077	1233	1432	1580	1796	AL	13.7%	13.4%	5.5	15.8%	16.8%	4.5	11.3%	26.6%	2.9
MS	50	80	140	207	249	320	377	485	579	663	758	847	937	1073	1177	1358	1455	1638	MS	12.6%	11.6%	6.3	14.3%	16.0%	4.7	47.9%	60.6%	1.5
UT	78	112	136	181	257	299	346	402	480	602	719	806	887	1012	1074	1246	1428	1605	UT	12.4%	14.3%	5.2	19.4%	21.4%	3.6	33.1%	32.4%	2.5
OK	44	49	53	67	81	106	164	248	322	377	429	481	565	719	879	988	1159	1252	OK	8.0%	12.5%	5.9	13.8%	20.0%	3.8	26.4%	15.0%	4.9
ID	11	23	31	42	47	50	73	123	189	230	261	310	415	525	669	891	1013	1077	ID	6.3%	17.2%	4.4	13.5%	28.5%	2.8	35.5%	56.3%	1.6
OR	88	114	114	161	191	209	209	327	414	479	548	606	690	736	826	899	899	999	OR	11.1%	6.5%	10.9	14.4%	18.8%	4.0	41.2%	22.3%	3.4
DC	39	71	77	98	116	137	183	231	267	304	342	401	495	586	653	757	902	998	DC	10.6%	15.2%	4.9	12.5%	14.0%	5.3	27.3%	36.0%	2.3
MN	89	115	138	169	235	262	287	346	398	441	503	576	629	689	742	789	865	935	MN	8.1%	8.0%	9.0	14.1%	13.3%	5.6	22.5%	23.8%	3.2
RI	33	54	66	83	106	106	124	165	165	203	294	408	488	566	657	711	806	922	RI	14.4%	12.0%	6.1	44.8%	21.2%	3.6	25.8%	36.0%	2.3
KY	35	47	54	99	104	124	157	198	248	302	394	439	480	591	680	770	831	917	KY	10.3%	10.5%	7.0	30.5%	25.8%	3.0	83.3%	41.4%	2.0
IA	38	45	68	90	105	124	145	179	235	298	336	424	497	549	614	699	786	868	IA	10.4%	12.2%	6.0	12.8%	23.4%	3.3	32.4%	33.3%	2.4
AR	46	96	118	165	174	218	280	335	381	404	426	473	523	584	643	704	743	830	AR	11.7%	8.9%	8.1	5.4%	8.3%	8.7	39.8%	53.1%	1.6
KS	34	44	55	64	82	98	126	168	202	261	319	368	428	482	552	620	698	747	KS	7.0%	10.6%	6.9	22.2%	23.8%	3.2	16.4%	23.5%	3.3
DE	30	38	45	56	68	91	115	130	163	214	232	264	319	368	393	450	593	673	DE	13.5%	19.6%	3.9	8.4%	21.3%	3.6	24.4%	23.1%	3.3
NH	39	44	55	65	78	101	108	137	158	187	214	314	314	415	415	479	540	621	NH	15.0%	14.4%	5.2	14.4%	16.0%	4.7	18.2%	18.6%	4.1
NM	35	43	57	57	65	83	100	112	136	191	237	237	281	315	363	403	495	543	NM	9.7%	14.4%	5.2	24.1%	28.4%	2.8	0.0%	17.7%	4.3
VT	22	29	29	52	75	95	123	158	184	211	235	256	293	321	338	389	461	512	VT	11.1%	14.8%	5.0	11.4%	14.1%	5.2	79.3%	33.2%	2.4
PR	5	14	21	23	31	39	51	64	79	100	127	174	239	286	316	378	452	475	PR	5.1%	14.6%	5.1	27.0%	25.7%	3.0	9.5%	66.3%	1.4
ME	53	57	73	89	107	125	149	155	168	211	253	275	303	344	376	432	456	470	ME	3.1%	7.7%	9.3	19.9%	17.7%	4.2	21.9%	18.9%	4.0
NE	27	32	38	48	50	52	61	73	85	96	108	145	172	210	246	279	321	363	NE	13.1%	13.8%	5.3	12.5%	13.9%	5.3	26.3%	21.1%	3.6
HI	16	26	37	48	56	77	90	95	106	120	151	175	204	208	258	285	319	351	HI	10.0%	10.8%	6.8	25.8%	16.7%	4.5	29.7%	44.2%	1.9
WV	2	7	11	12	16	20	39	51	76	96	113	126	162	191	217	237	282	324	WV	14.9%	14.3%	5.2	17.7%	30.4%	2.6	9.1%	81.7%	1.2
MT	12	16	20	31	34	46	53	71	108	129	154	171	184	208	227	243	265	286	MT	7.9%	8.0%	9.0	19.4%	29.4%	2.7	55.0%	37.2%	2.2
SD	11	14	14	21	28	30	41	46	58	68	90	101	108	129	165	187	212	240	SD	13.2%	13.3%	5.5	32.4%	25.1%	3.1	50.0%	24.1%	3.2
ND	15	20	28	28	30	34	39	52	65	83	98	109	126	142	159	173	186	207	ND	11.3%	9.2%	7.9	18.1%	23.5%	3.3	0.0%	23.1%	3.3
WY	18	19	23	24	26	29	44	53	70	82	86	94	109	130	150	162	187	197	WY	5.3%	9.5%	7.6	4.9%	17.5%	4.3	4.3%	10.1%	7.2
AK	6	12	14	22	22	36	42	59	69	85	102	114	119	133	143	157	171	185	AK	8.2%	9.0%	8.1	20.0%	20.0%	3.8	57.1%	54.2%	1.6

data from https://covidtracking.com/about-tracker/ 4/5/2020 4PM Eastern Time
Breitzman 4/6/2020 1:50 AM
*All US includes US territories not shown

Testing Numbers as of 4pm 4/5/2020

State	Positive	Negative	Pending	Positive + Negative	Positive / (Positive + Negative)	Deaths / Positive Cases
NY	122031	180249		302280	40%	3.4%
CA	13438	103095	15000	116533	12%	2.4%
FL	12151	101253	1129	113404	11%	1.8%
WA	7591	80327		87918	9%	4.1%
NJ	37505	44661		82166	46%	2.4%
PA	11510	66261		77771	15%	1.3%
MA	12500	59437		71937	17%	1.8%
TX	6812	64126		70938	10%	1.9%
LA	13010	47315		60325	22%	3.7%
IL	11256	47727		58983	19%	2.4%
MI	15718	30030		45748	34%	3.9%
TN	3633	41667		45300	8%	1.2%
OH	4043	39713		43756	9%	2.9%
NC	2585	37460		40045	6%	1.2%
UT	1605	29287		30892	5%	0.5%
MD	3609	24728		28337	13%	1.9%
GA	6647	21185		27832	24%	3.2%
WI	2267	25169		27436	8%	3.0%
AZ	2269	25141		27410	8%	2.8%
MO	2367	24882		27249	9%	1.4%
MN	935	25842		26777	3%	3.1%
CO	4565	19335		23900	19%	2.8%
VA	2637	21034		23671	11%	1.9%
CT	5675	17595		23270	24%	3.3%
IN	4411	18241		22652	19%	2.9%
SC	2049	16927		18976	11%	2.1%
OR	999	17926		18925	5%	2.6%
NV	1836	14995		16831	11%	2.5%
NM	543	16285		16828	3%	2.0%
KY	917	15746		16663	6%	4.4%
AL	1796	11282		13078	14%	2.5%
HI	351	12604		12955	3%	1.1%
AR	830	10412		11242	7%	1.9%
IA	868	9973		10841	8%	2.5%
ID	1077	9184		10261	10%	0.9%
WV	324	8514		8838	4%	0.9%
KS	747	7476		8223	9%	2.9%
RI	922	7181		8103	11%	2.7%
NH	621	7411	93	8032	8%	1.4%
MS	1638	5580		7218	23%	2.6%
DE	673	6321		6994	10%	2.1%
DC	998	5836		6834	15%	2.2%
ND	207	6580		6787	3%	1.4%
MT	286	6317		6603	4%	2.1%
VT	512	6070		6582	8%	4.3%
ME	470	6088		6558	7%	2.1%
AK	185	6099		6284	3%	3.2%
SD	240	5353		5593	4%	0.8%
WY	197	3040		3237	6%	0.0%
OK	1252	1401		2653	47%	3.7%

- Each state has more negative tests than positive tests which is better than last week
- Delaware is doing much better than last week
- California has an awful lot of pending tests but only 1/3 as many as last week.
- South Korea has extensive testing and has a mortality rate of 1.8%. Japan's is 2.4%. From this we can infer that NY probably has another 100,000 untested cases
- Source: https://covidtracking.com/about-tracker/

NJ COVID-19 Cases by County

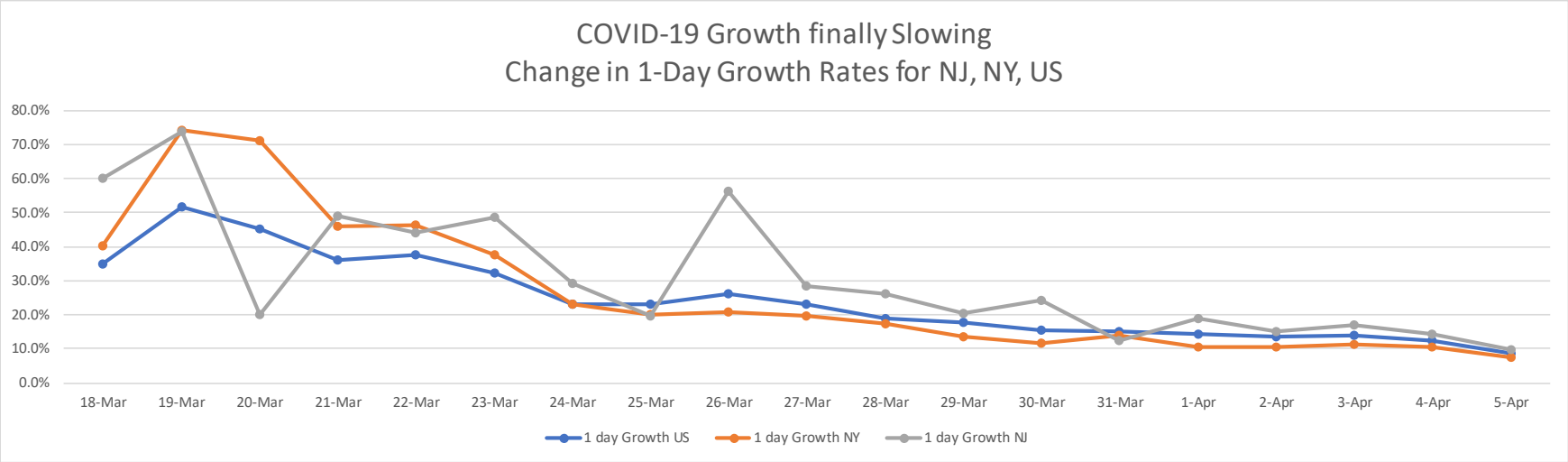
County	3/20 7:35am	...	3/23 2:01pm	3/24 3:43pm	3/25/ 2:00pm	3/26 2:57pm	3/27 2:03pm	3/28 1:00pm	3/29 2:48pm	3/30 2:32pm	3/31 1:01pm	4/1 1:00pm	4/2 1:00pm	4/3 1:05pm	4/4 1:03pm	4/5 1:15pm	1 Day Growth Rate	3 Day Average Growth Rate	Cases Double Every N Days
Bergen County:	195		609	701	819	1206	1505	1838	2169	2482	2909	3494	4099	4866	5760	6187	7.4%	14.7%	5.1
Essex County:	63		273	342	381	609	826	1086	1227	1564	1900	2262	2617	3067	3584	4082	13.9%	16.0%	4.7
Hudson County:	55		190	234	260	441	594	771	974	1314	1606	1910	2270	2835	3491	3924	12.4%	20.0%	3.8
Passaic County:	38		141	216	255	399	504	608	831	1091	1294	1494	1750	2216	2856	3227	13.0%	22.6%	3.4
Union County:	29		189	246	262	432	587	742	896	1213	1418	1661	2010	2487	2916	3216	10.3%	17.0%	4.4
Middlesex County:	64		210	277	316	505	657	808	938	1123	1277	1493	1766	2125	2578	2950	14.4%	18.7%	4.1
Monmouth County:	43		238	288	313	501	634	781	870	1030	1140	1301	1458	1743	2065	2354	14.0%	17.3%	4.3
Ocean County:	33		144	180	222	389	507	624	759	874	1022	1209	1371	1685	2003	2177	8.7%	16.7%	4.5
Morris County:	26		177	204	223	315	379	442	556	720	841	942	1082	1298	1618	1800	11.2%	18.5%	4.1
Somerset County:	21		67	102	117	179	219	258	295	349	413	472	549	641	765	833	8.9%	14.9%	5.0
Mercer County:	20		50	58	82	111	131	168	202	249	268	333	386	484	586	654	11.6%	19.2%	3.9
Camden County:	13		33	51	61	73	95	123	163	200	228	289	343	406	481	556	15.6%	17.5%	4.3
Burlington County:	14		36	42	48	64	88	115	142	178	202	255	294	367	469	547	16.6%	23.0%	3.3
Sussex County:	2		15	18	27	49	65	81	93	113	132	158	179	210	236	267	13.1%	14.3%	5.2
Gloucester County:	3		13	19	23	33	40	51	72	89	114	149	169	183	215	248	15.3%	13.6%	5.4
Warren County:	3		12	15	18	31	41	51	56	68	76	96	116	149	182	195	7.1%	18.9%	4.0
Hunterdon County:	8		18	25	25	39	52	61	66	79	97	117	130	148	171	189	10.5%	13.3%	5.6
Atlantic County:	3		6	6	9	10	14	17	24	29	31	40	50	72	98	121	23.5%	34.3%	2.4
Cape May County:	1		2	3	4	6	7	7	9	9	12	22	34	44	50	77	54.0%	31.3%	2.5
Cumberland County:			1	2	3	4	9	11	11	12	18	27	31	36	40	54	35.0%	20.3%	3.7
Salem County:			1	1	1	2	2	3	3	3	12	19	20	25	25	26	4.0%	9.1%	7.9
Unassigned NJ	118		419	645	933	1478	1984	2478	3020	3847	3686	4512	4866	4808	3935	3821	-2.9%	-7.7%	-8.6
All NJ	752		2844	3675	4402	6876	8938	11124	13376	16636	18696	22255	25590	29895	34124	37505	9.9%	13.6%	5.4

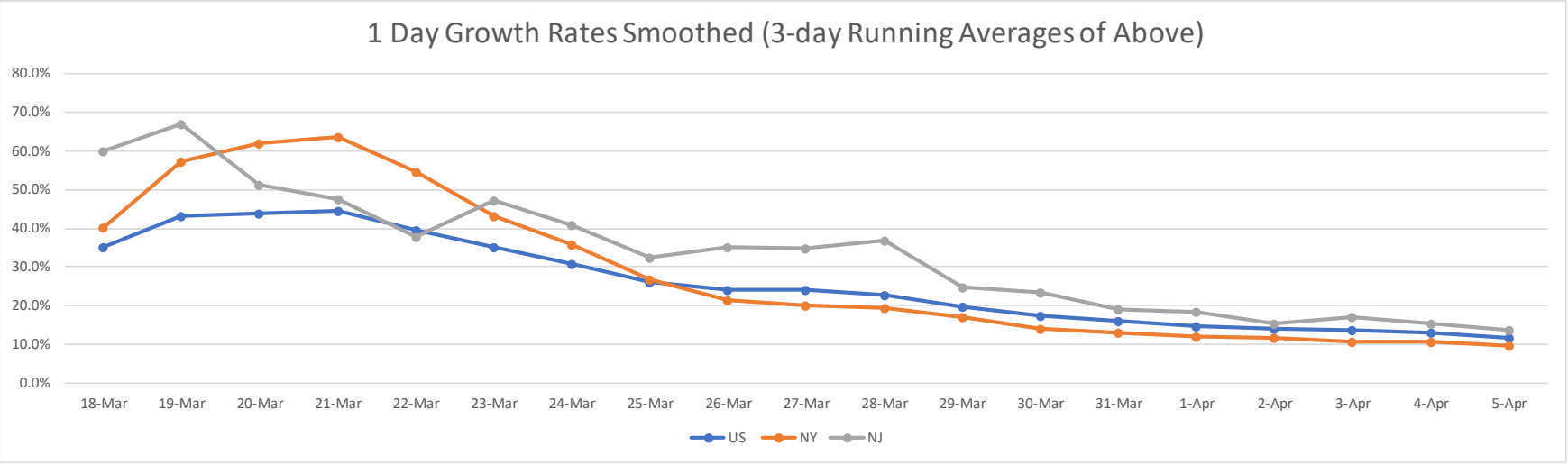
Source: https://www.insidernj.com/insidernj-covid19-information-update-center/
Data confirmed at covid19.nj.gov at 4/5/2020 5:21pm
Data is provisional and subject to revision.
NJ Total confirmed at JHU at 4/5/2020 5:22 pm
Breitzman 4/5/2020 5:22pm

Note: On March 27 at 2:03 Middlesex, Morris, Passaic, Ocean, Somerset, Sussex, Union, and Warren Counties had not updated their counts from the previous day. For these entries we take the average of counts for 3/26 and 3/28. (March 27 is not involved in any of the projections.)

Notes on Previous Slide

- Bergen county hit the worst, but growth rates starting to slow
- South Jersey many fewer cases than North Jersey, but growth rates are worse
- Atlantic and Cape May counties growing at twice the state rate
- Last week it appeared NJ would hit 50,000 cases by today, but the growth rate slowed. Current rate suggests 75,000 cases by next weekend, but if the rate continues to slow we may see 55,000 cases instead (which is still 22,000 more than today)





COVID 19 Cases by Date

	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar	27-Mar	28-Mar	29-Mar	30-Mar	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr
All US	7730	11719	17033	23197	31879	42152	51954	63928	80735	99413	118234	139061	160530	184683	210816	239099	271988	305755	332308
NY	2382	4152	7102	10356	15168	20875	25665	30811	37258	44635	52318	59513	66497	75795	83712	92381	102863	113704	122031
NJ	427	742	890	1327	1914	2844	3675	4402	6876	8825	11124	13386	16636	18696	22255	25590	29895	34124	37505

1 Day Growth Rates by Day

	18-Mar	19-Mar	20-Mar	21-Mar	22-Mar	23-Mar	24-Mar	25-Mar	26-Mar	27-Mar	28-Mar	29-Mar	30-Mar	31-Mar	1-Apr	2-Apr	3-Apr	4-Apr	5-Apr
1 day Growth US	35.1%	51.6%	45.3%	36.2%	37.4%	32.2%	23.3%	23.0%	26.3%	23.1%	18.9%	17.6%	15.4%	15.0%	14.2%	13.4%	13.8%	12.4%	8.7%
1 day Growth NY	40.1%	74.3%	71.1%	45.8%	46.5%	37.6%	22.9%	20.1%	20.9%	19.8%	17.2%	13.8%	11.7%	14.0%	10.4%	10.4%	11.3%	10.5%	7.3%
1 day Growth NJ	59.9%	73.8%	19.9%	49.1%	44.2%	48.6%	29.2%	19.8%	56.2%	28.3%	26.1%	20.3%	24.3%	12.4%	19.0%	15.0%	16.8%	14.1%	9.9%

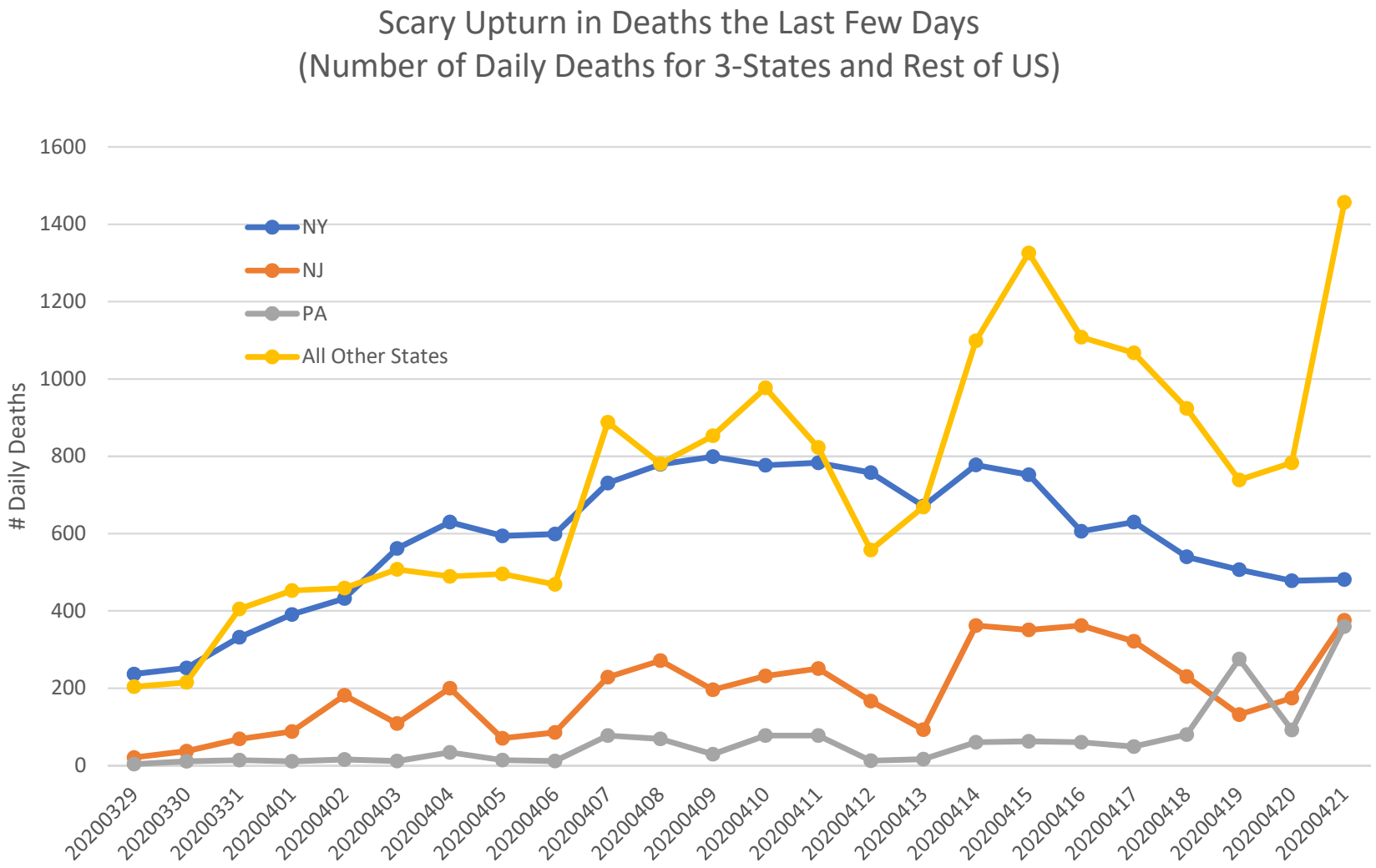
data from https://covidtracking.com/about-tracker/ 4/5/2020 4PM Eastern Time

Breitzman 4/6/2020 1:50 AM

Summary

- Things are bad, but there is evidence that social distancing and staying home is starting to slow down the rate of infection
- Cases are still growing rapidly, but at a rate much slower than last week and the week before
- Pennsylvania and Delaware have not flattened the curve as well as other states
- Testing is much better than it was, but evidence from South Korea and Japan suggests it is still lagging in certain states

Addendum from 4/21/2020



Breitzman 4/22/2020 2:12 AM Source:
https://covidtracking.com/api 4/21/2020 4PM

	=========Tests==========							
state	positive	negative	pending	Total Tests	Deaths	Deaths/Positive Cases	Potential Cases*	Potential/Actual
MI	32967	84259		117226	2700	0.082	195652	5.93
CT	20360	43832		64192	1423	0.070	103116	5.06
MN	2567	45130		47697	160	0.062	11594	4.52
NY	251690	397635		649325	14828	0.059	1074493	4.27
OK	2807	41537		44344	164	0.058	11884	4.23
LA	24854	117576		142430	1405	0.057	101812	4.10
WA	12085	128926		141011	652	0.054	47246	3.91
KS	2025	17076		19101	107	0.053	7754	3.83
WI	4620	47841	219	52461	242	0.052	17536	3.80
IN	12097	55167		67264	630	0.052	45652	3.77
NJ	92387	92439		184826	4753	0.051	344420	3.73
KY	3050	29770		32820	154	0.050	11159	3.66
VT	818	12293		13111	40	0.049	2899	3.54
MA	41199	134173		175372	1961	0.048	142101	3.45
PA	34528	132323		166851	1564	0.045	113333	3.28
CO	10106	37360		47466	449	0.044	32536	3.22
IL	33059	121938		154997	1468	0.044	106377	3.22
OH	13250	80989		94239	557	0.042	40362	3.05
NV	3937	29118		33055	163	0.041	11812	3.00
MD	14193	59442		73635	584	0.041	42319	2.98
ME	888	14076		14964	36	0.041	2609	2.94
GA	19881	68259		88140	799	0.040	57899	2.91
AZ	5251	49901		55152	208	0.040	15072	2.87
OR	2002	39126		41128	78	0.039	5652	2.82
MS	4716	47648		52364	183	0.039	13261	2.81
CA	33261	266839		300100	1268	0.038	91884	2.76
DC	3098	11841		14939	112	0.036	8116	2.62
VA	9451	48903	477	58354	324	0.034	23478	2.48
AL	5231	43295		48526	177	0.034	12826	2.45
MO	5941	51179		57120	189	0.032	13696	2.31
FL	27495	249564	1203	277059	856	0.031	62029	2.26
RI	5500	33833		39333	171	0.031	12391	2.25
NC	6951	76380		83331	213	0.031	15435	2.22
NM	1971	36784		38755	58	0.029	4203	2.13
WV	914	21849		22763	26	0.028	1884	2.06
NH	1491	12848	244	14339	42	0.028	3043	2.04
DE	2931	13725		16656	82	0.028	5942	2.03
SC	4439	36838		41277	124	0.028	8986	2.02
ID	1736	15924		17660	48	0.028	3478	2.00
MT	437	10804		11241	12	0.027	870	1.99
AK	329	10790		11119	9	0.027	652	1.98
TX	20196	185203		205399	517	0.026	37464	1.86
IA	3641	23974		27615	83	0.023	6014	1.65
TN	7394	100788		108182	157	0.021	11377	1.54
ND	644	14343		14987	13	0.020	942	1.46
AR	2227	25214		27441	43	0.019	3116	1.40
WY	320	7301		7621	6	0.019	435	1.36
HI	584	24112		24696	10	0.017	725	1.24
UT	3296	69062		72358	32	0.010	2319	0.70
SD	1755	11060		12815	8	0.005	580	0.33
50 State Total	796570	3330287	2143	4126857	39888	0.050	2890435	3.63

The Lancet Infectious Diseases medical journal estimates that about 0.66 percent of patients who become infected with the virus will die. When undetected infections aren't taken into account, researchers found the coronavirus death rate was 1.38 percent.

*Potential Cases is based on the more conservative mortality rate of 1.38 percent

This suggests NJ may have about 3.5 times as many cases as it thinks it does. The same is true for the country as a whole.

Of course if we take the higher estimate of 0.66% then the numbers double from the projections

Source: https://covidtracking.com/api 4/21/2020 4PM

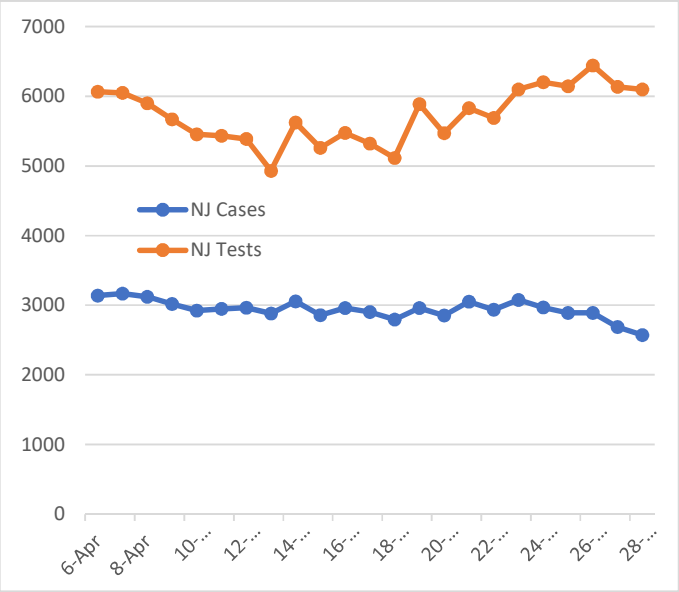
Breitzman 4/22/2020 2:08 AM

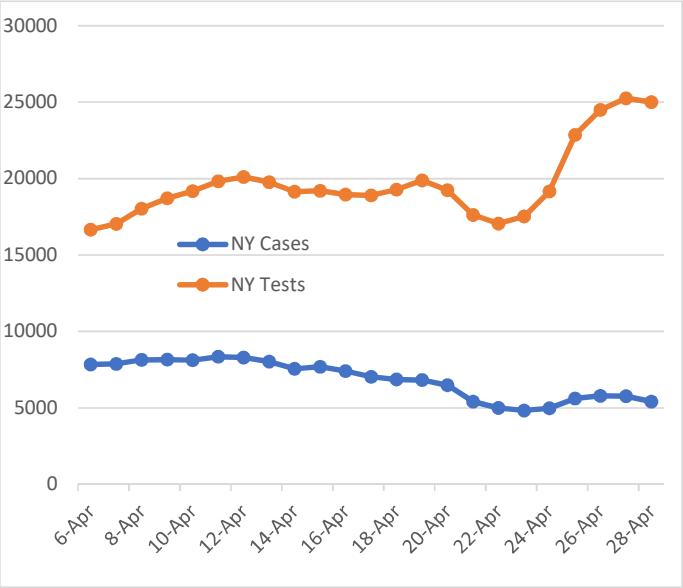
Addendum from 4/29/2020

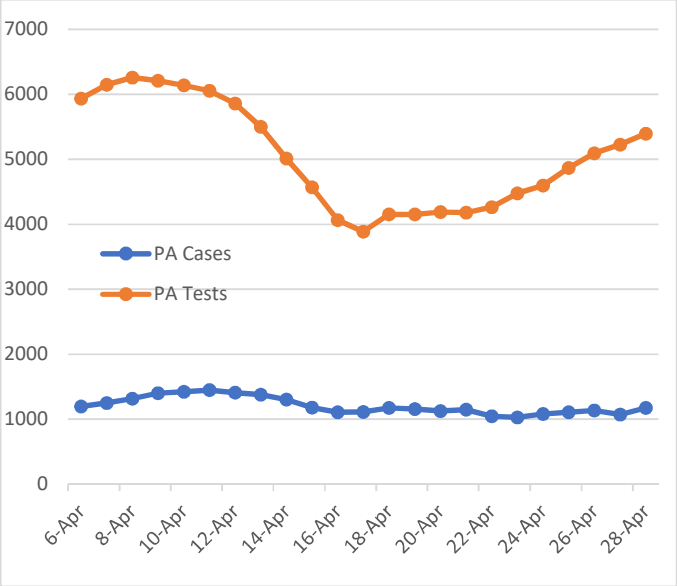
COVID-19 Daily Cases versus Daily Testing for 4 States and Rest of Country

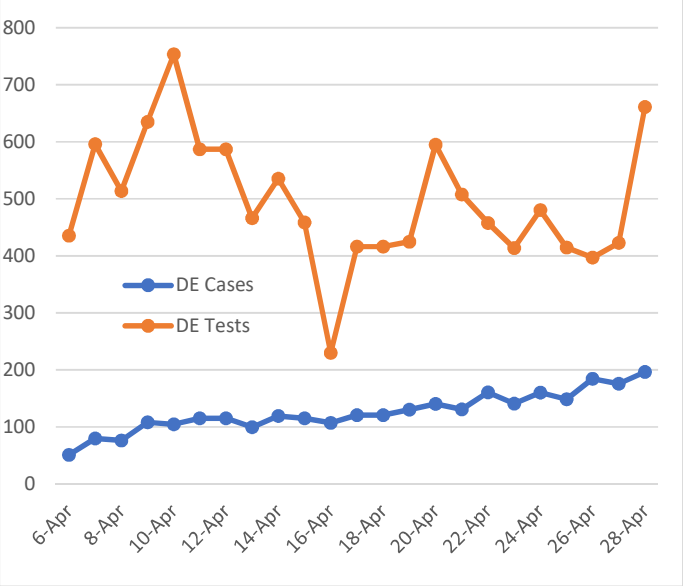
(7 Day Rolling Averages to Smooth Out Curves)

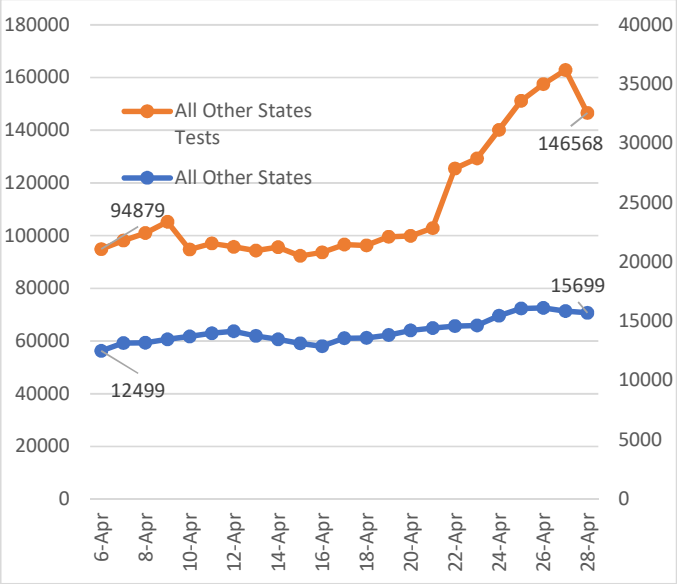
(Note: Each State Axis to different Scale)











Source:
https://covidtracking.com/api as of 4pm 4/28/2020

Notes:
1. All graphs are 7 day rolling averages
2. Cases still rising in US and Delaware
3. Note secondary axis in Other State graph
4. Only NY is increasing testing significantly while cases are decreasing.
5. Delaware testing all over the place. Perhaps reporting is not consistent

7-Day Rolling averages consist of (cumulative cases in day x - cumulative cases in day x - 6)/7

Breitzman: 4/29/2020 2:44 AM