

Yesterday's growth in **total US new cases remained relatively flat at 15%** or ~28,000 new cases. The rate of new case growth has also moderated in New York, Washington and all other states below the Top 12 States. The Top 12 States (*excludes New York*) continue to see rising growth in new cases to 23% yesterday, or ~12,000 cases. The rate of growth in new cases has also been rising for 3 days, also at 23% yesterday (*see charts below/spreadsheet*). Testing has hit a ceiling with 7 days at ~100,000 tests per day. We MUST find a path to higher test volumes and see the "promise" of new capability appear in the #'s. The net today; our Index State, Washington, has now lowered daily case growth to ~5%. New York has moderated growth and the pace of the outbreak is now declining. The challenge now falls to other states and the **emerging "Hot Spots" are New Jersey, Michigan, California, Illinois, Louisiana, Georgia and Texas**. We thought we would focus in on "Hot Spot" dynamics and leading indicators today.

Hot Spot Dynamics/Indicators

We can use New York and Washington State as guides to how Hot Spots develop and the early indicators. Here are the conditions that have been present to create Hot Spots:

Conditions

- 1) High Population Density – *Contained Populations: Large Cities, Congregations or Groups (e.g. New York, Cruise Ships, Nursing Homes, Church/Social Groups-Gatherings)*
- 2) Constrained/Common Supply Chains: *Common/Single Contact Points (e.g. Nursing Homes, Cruise Ships, etc)*
- 3) Low Levels of Testing in early days of community spread: *New York, Washington State, Cruise Ships, Nursing Homes*
- 4) High Base Volumes of Infected: *Cities with 2,000+ cases*

Growth Math

- 50% Daily Case Growth → Total Cases **Double every 2 days**
- 20% Daily Case Growth → Total Cases **Double every 4 days**
- 15% Daily Case Growth → Total Cases **Double every 6 days**
- 10% Daily Case Growth → Total Cases **Double every 8 days** (Note: if getting total US daily case growth to 10% or lower is our intermediate goal, we will still a doubling in Total Cases every 10 to 12 days)
- 5% Daily Case Growth → Total Cases **Double every 14 days**

New Hot Spots – New York Case Study

-**Early:** Total confirmed cases in New York 20 days ago were ~200 – *Totals were likely much higher at that point due to population density, lack of awareness/controls and limited testing (~300 tests per day)*

-**Early:** Confirmed daily new cases were expanding at ~20% per day, or about 50 cases

-**Spread:** Over 5 days, total cases grew to 2,000, the rate of daily growth in cases expanded from 20% to 70% and % positive tests grew from 10% to 40% - Testing totaled ~1,000 per day

-**Growth Peak:** Over the next 6 days cases grew 10X to 21,000. The average rate of growth in new cases was nearly 60% - total cases doubled every 2 days – Hospitalized cases grew from 100, to 2,600 – Tests grew to 6,000 per day

-**Case Expansion:** Over the next 4 days, daily new case growth slowed to 22%, but on a large base at this rate new cases doubled every 4 days to 44,000 – Hospitalized cases grew to 8,200, overwhelming the hospital system

-**Growth Decline:** Over the last 4 days new case growth slowed to ~13%, or ~7,000 new cases per day, testing expanded to 9,000 per day, 50% are still testing positive and Hospitalization grew to 16,000 on a large spread base

Key Hot Spot Indicators: Large case base (>2,000), Escalating daily new case grow (>20%), Escalating Positive Test outcomes (>30%)

New Restrictions/Containment: States and many Counties/Cities continue to accelerate border controls/restrictions/closures over the last few days (*Hawaii, Texas-Louisiana, Florida, Massachusetts, Vermont, Rhode Island, Delaware, Alaska, Kansas, Kentucky, Maryland, North Dakota*).

Headlines:

- Many States engaged in “Surge Planning” in hospital bed capacity as they continue to see rising case volumes. These are based on more refined models of virus progression that are now based on a good data history, these show the case growth peaks mid-April. These are current worse case projections for planning purposes. (*this is a good model: <https://covid19.healthdata.org>*)
- Total US testing has remained flat for 7 days at ~100,000 tests. No sign yet of new capacity or capability in daily numbers since we grew testing from ~50,000 per day a week ago
- **New US Cases Growth – Total US new case growth is ~15% for the 3rd day. Daily Rate of Growth has trended downward in all states but the Top 12.**
 - **New York:** The growth in new cases growth has held flat at ~12% for three days, The peak in growth and spread has now passed for the present.
 - **Top 12 States:** Total new cases grew at 17% yesterday, or ~12,000 cases. The rate of new case growth rose to 23% yesterday as new Hot Spots are developing in these states.
 - **All Other State Totals:** Total new cases grew at 15% yesterday, or 4,156. The rate of new case growth fell to 3% yesterday
 - **Washington State:** Appears to have hit a baseline in new case growth at ~5%. New cases grew by 232 yesterday.
- **Hospitalization:** Rates held steady at roughly 14%, with a total of 26,990 Hospitalized cases yesterday.
- **Mortality:** increased yesterday to 2.1% yesterday, up from 1.9 % the day prior.
- **Positive Tests rates rose to 24% from 20% the day prior.**

Testing:

- Testing yesterday of ~102,000 total tests. This has been flat at this level for 7 days. We have conducted ~1,118,873 tests across the US to date.
- The rate of positive outcomes rose to 24% yesterday. Several states had high % positive rates: *New York, New Jersey, Michigan, Georgia, Connecticut*

New/Active Cases

- **Total new case growth rate was 15%, Top 12 States are seeing expanding case growth (23%) for the last three days. Rate of growth (spread) declined yesterday in all but the Top 12 States.**
- Total new cases grew 15% yesterday, or 24,742, up from 20,354 cases yesterday.

Hospitalization

- The Hospitalization remained steady yesterday at ~14% after rising steadily the last three days and up from 7.7% on last Monday.
- **New York Hospitalization grew to 15,904 cases, up from 13,721 cases the prior day – New York total bed capacity is ~53,000, and ICU bed capacity is ~3,000**
- Total positive cases in hospital beds across the US yesterday was 26,990 up from 22,490 the prior day.

- **Total US Hospital beds are ~925,000, Total US ICU Beds is ~100,000**

Recovery/Mortality

- The Mortality rose 0.2% to 2.1% nationally. Deaths totaled 3,889 across the US to date.