Lincoln-Lancaster County Health Department
COVID-19 Risk Dial Metrics
Updated: July 31, 2020

INTRODUCTION

The COVID-19 Risk Dial was developed by the Lincoln-Lancaster County Health Department (LLCHD) to help communicate to the public the risk of spread of COVID-19 in the community. Since its inception in May, LLCHD has used five primary measures that can be described using current data to communicate the risk to the public: Positivity Rate, Cases, Testing, Contact Tracing, and Health Care System Capacity.

These measures are commonly cited by numerous reputable public health agencies and research organizations as important public health indicators for COVID-19. Over the course of the pandemic, public health agencies such as the World Health Organization, the U.S. Centers for Disease Control and Prevention, State Health Departments, national public health associations, schools of public health, research foundations, and many other organizations have proposed specific metrics to measure the progress of, or set goals for, controlling the COVID-19 pandemic. Not surprisingly, measures and metrics have evolved, and multiple iterations of similar metrics have been offered by different organizations. In addition, some measures thought to be very important early on, such as the availability of ventilators, have become less important as best practices for medical care given to COVID-19 patients has changed. There is little doubt that many other changes in measures and metrics will occur as we continue to fight this global pandemic.

The Lincoln-Lancaster County Health Department (LLCHD) has continuously monitored this evolution of measures and metrics and selected measures and metrics for which data is available locally and which can be practically applied to our local jurisdiction. The LLCHD has modeled the metrics used for the COVID-19 Risk Dial on recommendations found in the following three resources:
- Johns Hopkins Bloomberg School of Public Health Coronavirus Resource Center https://coronavirus.jhu.edu/ with special emphasis on their "Testing Hub" https://coronavirus.jhu.edu/testing and their June 2020 report "Covid-19 Management Metrics for Cities" https://coronavirus.jhu.edu/from-our-experts/management-metrics-for-cities-in-the-covid-19-crisis
- U.S. Centers for Disease Control and Prevention (CDC) "CDC Activities and Initiatives Supporting the COVID-19 Response and the President's Plan for Opening America Up Again" https://www.cdc.gov/coronavirus/2019-ncov/downloads/php/CDC-Activities-Initiatives-for-COVID-19-Response.pdf
- Resolve to Save Lives & Vital Strategies "Essential Information for States and Counties to Publicly Report", led by former CDC Director Dr. Tom Frieden and endorsed by the American Public Health Association, the Association of Schools of Public Health, Trust for America's Health, and Johns Hopkins Bloomberg School of Public Health. https://preventepidemics.org/wp-content/uploads/2020/07/Tracking-COVID-19-in-the-United-States-Report.pdf
Throughout this document these three resources will be noted as JH, CDC, and RTSL, respectively.

Following is a list of the measures and metrics LLCHD uses and a description how they relate to the position of the LLCHD COVID-19 Risk Dial.

1. **SHORT TERM POSITIVITY RATE** – The positivity rate of tests conducted in the last three weeks is a key metric along with the trend. LLCHD evaluated measures from JH, CDC, RTSL, and the World Health Organization. A common positivity rate used to reflect low risk of spread is 5%. LLCHD also evaluated data that has become available in the past two months in the U.S. Data from the last two months (June and July) has revealed that States with positivity rates greater than 15% have had extensive community spread of COVID-19 and are clearly the hardest hit with high rates of illness, hospitalizations, and high numbers of deaths. Currently that includes: AL, AZ, FL, ID, KS, MS, and SC. (source JH testing hub) Based on these resources and evidence available from the current surge, LLCHD chose to use 5% increments for positivity which correlate with the LLCHD COVID-19 Risk Dial as follows:

Three Week Average Percent Positivity
<1%
1 to 5%
>5% to 10%
>10% to 15%
>15%

The graph below is from Johns Hopkins COVID Resource Center and shows which U.S. States exceed the 5% threshold as of July 23, 2020.

Taking into consideration the trend in the positivity rate is important in that it reveals if the risk of spread is increasing or decreasing. CDC used a downward trajectory of positive tests over a 14-day period as a "gating criteria" for reopening America.

This page was last updated on Thursday, July 23, 2020 at 03:00 AM EDT.
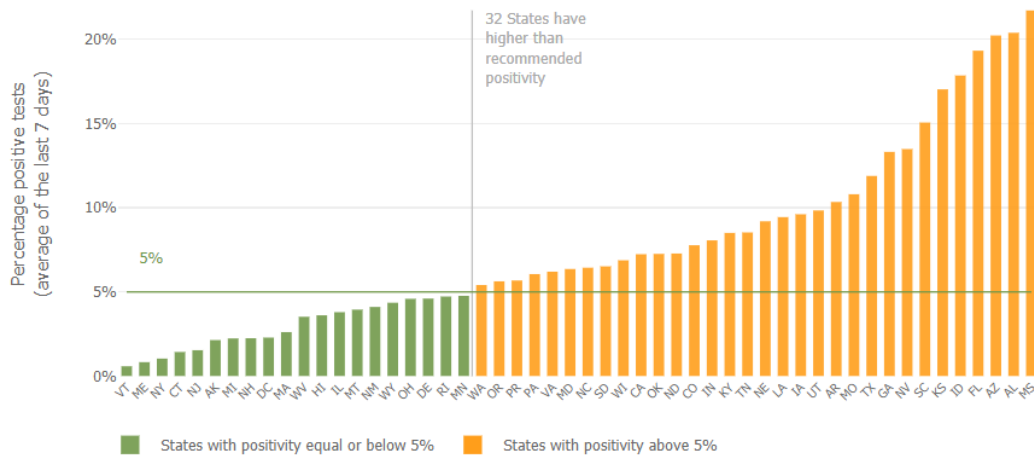
2. **CASES** – The average number of new cases per day per 1,000 people in our County, and the trend over the past three weeks. Johns Hopkins University COVID Resource Center Testing Hub provides various measures/metrics for COVID-19. https://coronavirus.jhu.edu/testing/tracker/map One of those measures is the "New Confirmed Cases per 1,000 People." For their purposes, Johns Hopkins chose to use a scale with 7 cutoffs ranging from 0.0 to 0.50 cases per 1,000. LLCHD condensed Johns Hopkins scale and applied it

to the LLCHD COVID-19 Risk Dial. For the majority of the pandemic, Lancaster County has had less than .25 cases per 1000 population.

Johns Hopkins Rates	LLCHD Rates	Avg. Cases Per Day
0.00	0.00	0
0.08	0.08	< 26
0.17	0.17	27 to 51
0.25	0.25	52 to 105
0.33	0.33	106 to 130
0.41	0.41	131 to 159
0.50	0.50	>160

3. **TESTING -** Testing availability is evaluated based on utilization of local test sites relative to their capacity. Currently, multiple test sites offer testing 6 days per week and have additional capacity for more people to be tested. Another key metric related to testing is the time it takes for LLCHD to receive test results from the date of sample collection (turnaround time). LLCHD's goal is to have the majority of tests results reported within 48 hours.   When the turnaround time exceeds 48 hours, that increases the likelihood that someone who tests positive may expose others and that those close contacts may develop COVID-19 before LLCHD can communicate with them.

Testing Availability
Rapid Testing Available to All
High Availability/Exceeding Need
Available/Meeting Need
Not meeting Need
Severe Shortage of Testing

Turnaround Time from Sample Collection to Report
<1 day
1   day
2 to 3 days
4 to 6 days
7 days or more

4. **CONTACT TRACING & CLUSTER IDENTIFICATION –** The length of time it takes to make first contact with the original case and those with whom they have had close contact is a key to containing outbreaks. In addition, the percentage of cases that are identified as being connected to other cases is a measure of community spread. LLCHD's Epidemiology Team reviews all case investigations to identify connections and potential clusters. LLCHD's benchmark is to make initial contact with the case within 24 to 48 hours, which is aligned with JH, RTSL, and CDC metrics.   A second metric related to contact tracing measures the percent of cases that are identified to be connected to other cases. If cases are connected, then the

Percent of Cases & Contacts Contacted Within 24 to 48 hours
>80%
70 to 79%
60 to 69%%
50 to 59%
<50%

Percent of Cases Connected to Another Positive Case
>80%
60 to 79%%
40 to 59%
20 to 39%
<20%

source of the spread of COVID-19 is known and it is easier to contain in the community. RTSL recommends that the goal should be 80%. LLCHD's Surveillance and Epidemiology Team recommended that for this metric, each cutoff should be 20% lower than the goal.

5. **HEALTH CARE SYSTEM CAPACITY -** ICU Bed Availability and Beds Used by COVID-19 Patients. The percentage of Intensive Care Unit (ICU) beds that are available, and the number of hospital beds currently being used by COVID-19 patients are reported to LLCHD by the local hospital systems.   The concept of ICU and hospital bed capacity has changed substantially through the pandemic. Initially, early modeling by prestigious international organizations, universities and think tanks, projected that hospitals would likely be overwhelmed with patients and ICU bed capacity and ventilators would be critical issues as COVID-19 swept across the U.S. (Note: These predictions were supported by data from Italy and Spain, and then from New York City.) Elective surgeries were suspended in order to free up other beds that could be used to care for COVID-19 patients. However, over time, those states and communities that quickly took actions to prevent COVID-19 from rapidly spreading and successfully protected the most vulnerable populations in long term care facilities, had much lower impacts on the hospital systems. This was followed by changes in best practices for medical care of COVID-19 patients and new therapeutics becoming available.

Percent of ICU Beds Available
60%
50%
30%
20%
0%

Beds Used to Care for COVID-19 patients
0
<10
10 to 19
20 to 44
>44

Lincoln has yet to experience a significant shortage of hospital beds, ICU beds or ventilators. However, that does not mean that COVID-19 does not place a stress on the health care system. After considering various measures of system capacity, LLCHD followed the lead of the Douglas County Health Department and established a metric based on the number of local hospital beds in use by COVID-19 patients. In addition, LLCHD has chosen to use a metric on the percent of ICU beds available. Lincoln has had over 50% of the ICU beds available throughout most of the pandemic. In areas of the country where COVID-19 became unmanageable, it was preceded by a rapid decrease in ICU bed availability, with 30% often being suggested as a "tipping point" after which systems became overwhelmed.

Conclusion

LLCHD wants to ensure that we are clearly communicating the risk of COVID-19 spread to our community. These measures and metrics were developed from reputable public health resources and by our LLCHD team, which includes staff that have decades of experience in epidemiology, outbreak investigations and biostatistics.   The LLCHD COVID-19 Risk Dial provides the most robust description of risk to the public regarding our local situation. As our knowledge of this pandemic and interventions grows, revisions may be made to these measures and the thresholds.