



NSSP

National Syndromic
Surveillance Program

BioSense Platform

In Partnership

With You!



How Can Syndromic Data be Used for COVID-19?



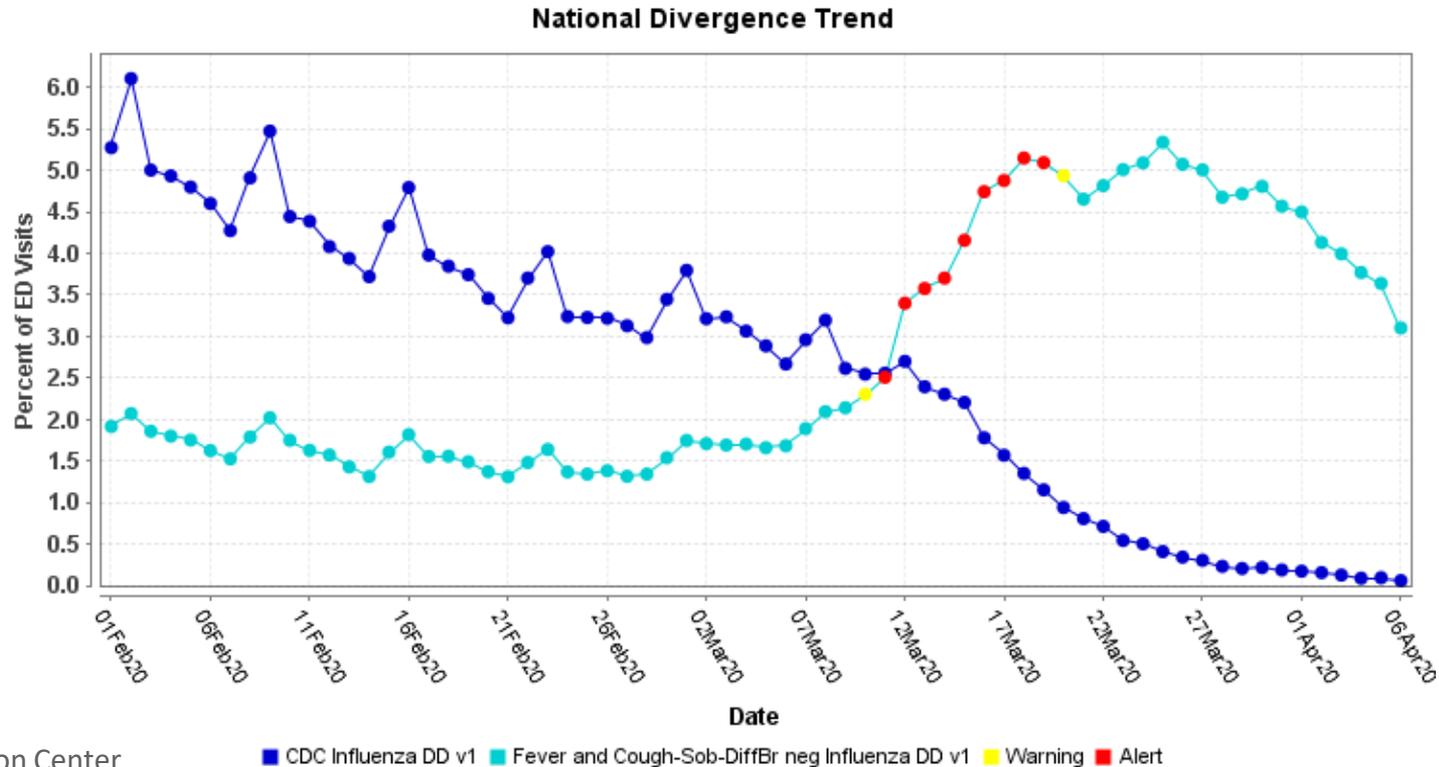
National Syndromic Surveillance Program

First Steps: Community-informed definitions

- Created fever and (cough or Shortness of Breath (SoB) or Diff. Breathing) negating influenza dx.
 - Original category to monitor COVID-like illness (CLI).
- CDC issued guidance on what ICD-10 codes clinicians should use when they suspect a case of COVID-19.
 - Developed a coronavirus diagnosis (dx) only category based on this guidance, which is now available in ESSENCE for routine querying.
- Merged coronavirus dx with CLI.
 - Primary category to monitor CLI.
- Washington State sent list of early cases.
 - Those were found in ESSENCE and symptoms and ICD codes reviewed.
 - No adjustments to the definition were required.

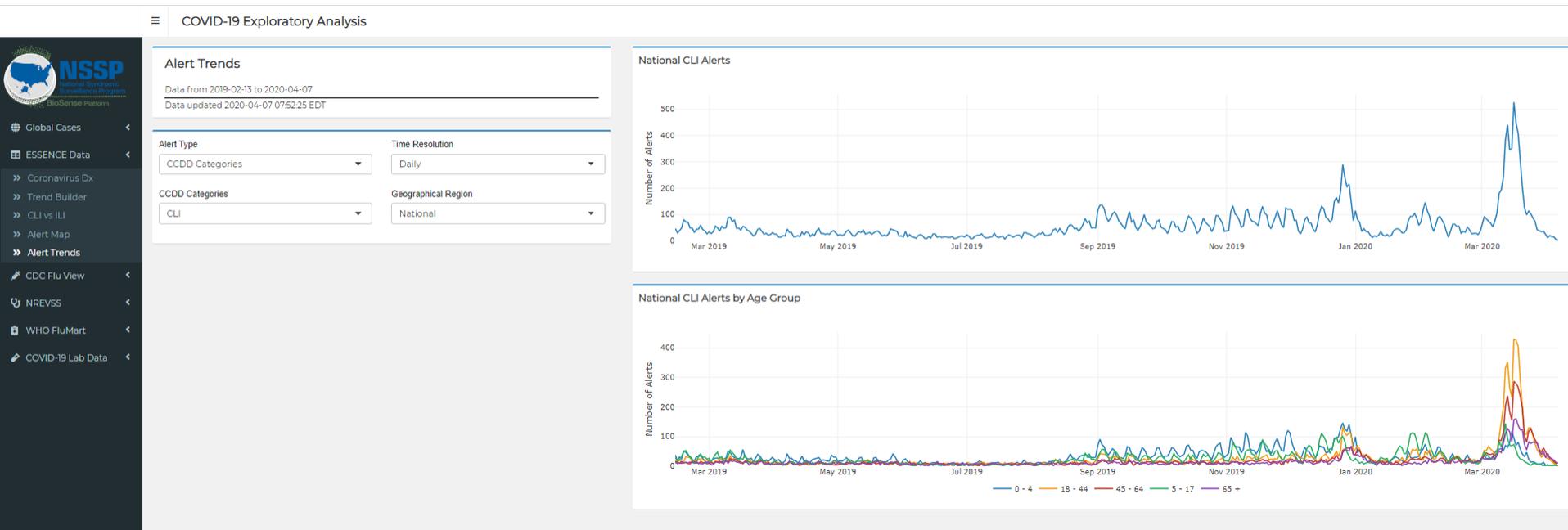
What are the best ways to track COVID-19 symptoms and differentiate influenza? (CoP, CDC/NSSP, NRCC*)

Used the COVID Like Illness (CLI) definition and an influenza diagnosis-based definition to show divergence between flu and CLI.



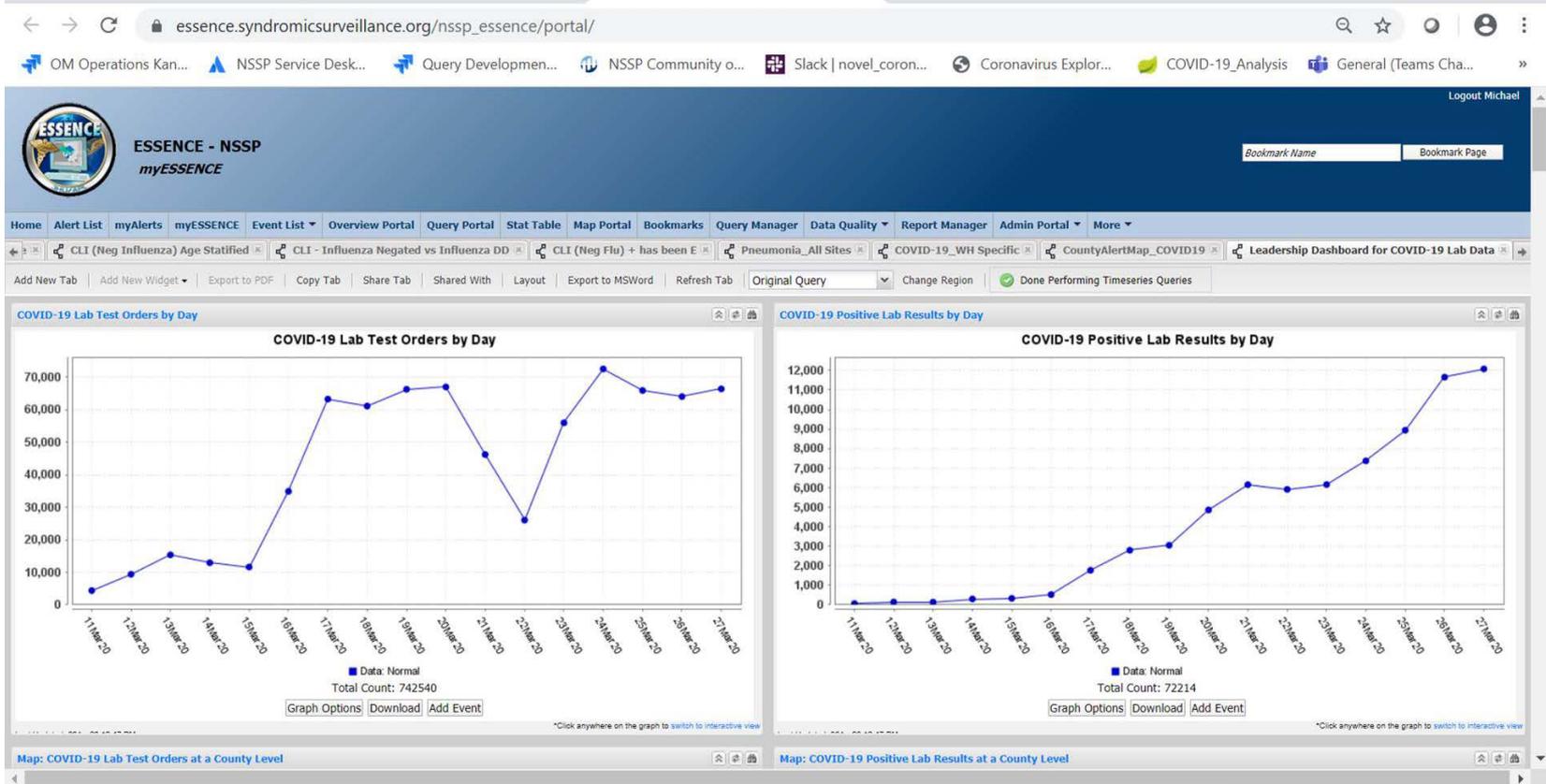
* National Response Coordination Center

Developed and deployed R Shiny-based dashboard (ESSENCE API) for CDC EOC* and community use



* Emergency Operations Center

CoP members and NSSP developed dashboards monitoring different aspects of COVID-like illness (CLI)



Surveillance support for states

- Nssp team developed CLI, Pneumonia, and Coronavirus diagnosis alerts by county and age group.
- Nssp created dashboards and reviewed thousands of alerts.
 - Nssp sent over 100 situational awareness emails on these CLI alerts and other observations in ED data.

Positive feedback from partners!

“Sounds great. Looking forward to receiving alerts, particularly related to CLI or Pneumonia.

Thank you very much.”

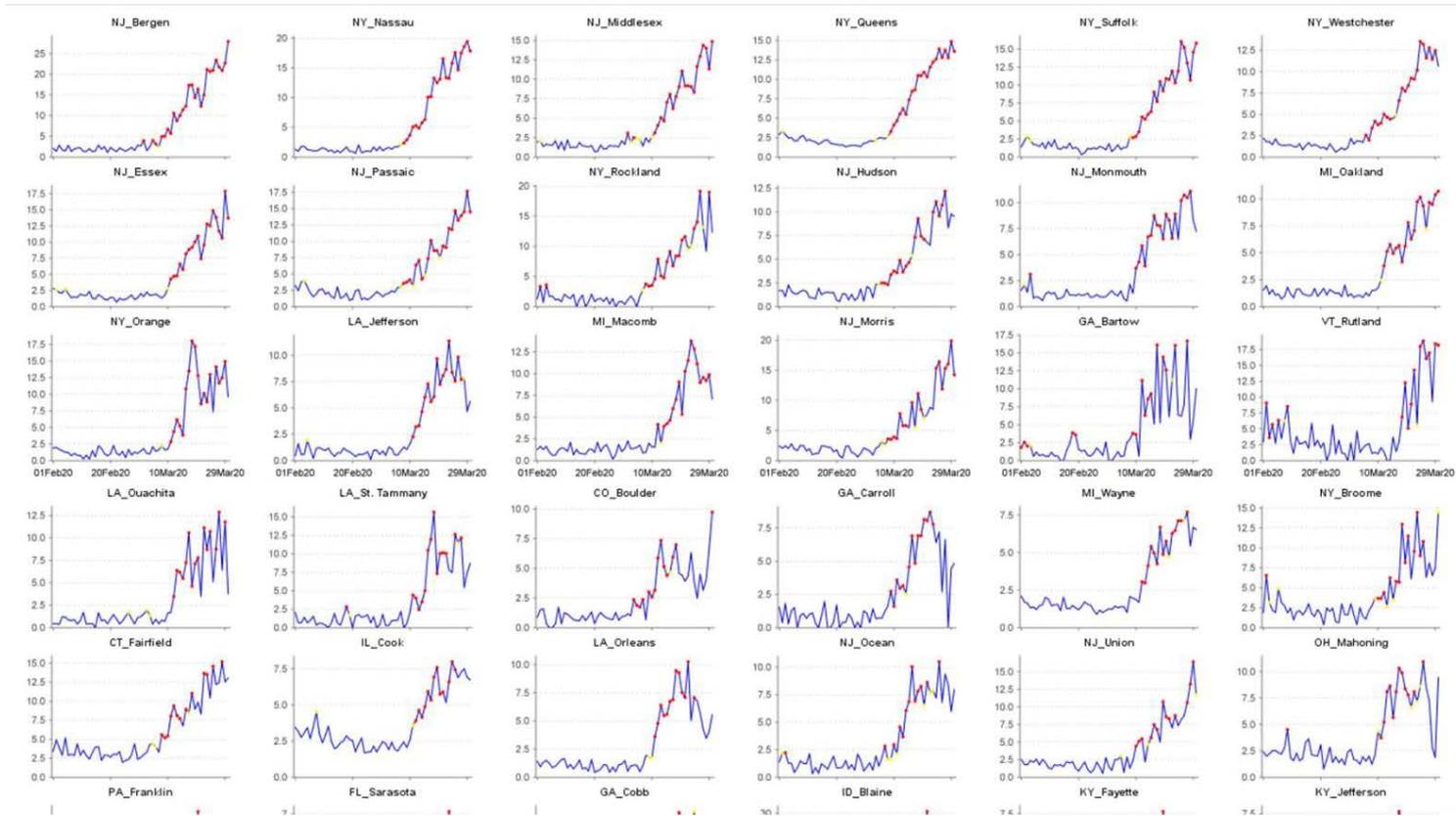
“Super helpful. Thank you.”

“Thanks! And yes, these are helpful. Lots of response activity here right now. Appreciate y’all!”

“Thank you, Nssp colleagues! I’ll send this on to our health intelligence section folks right now.

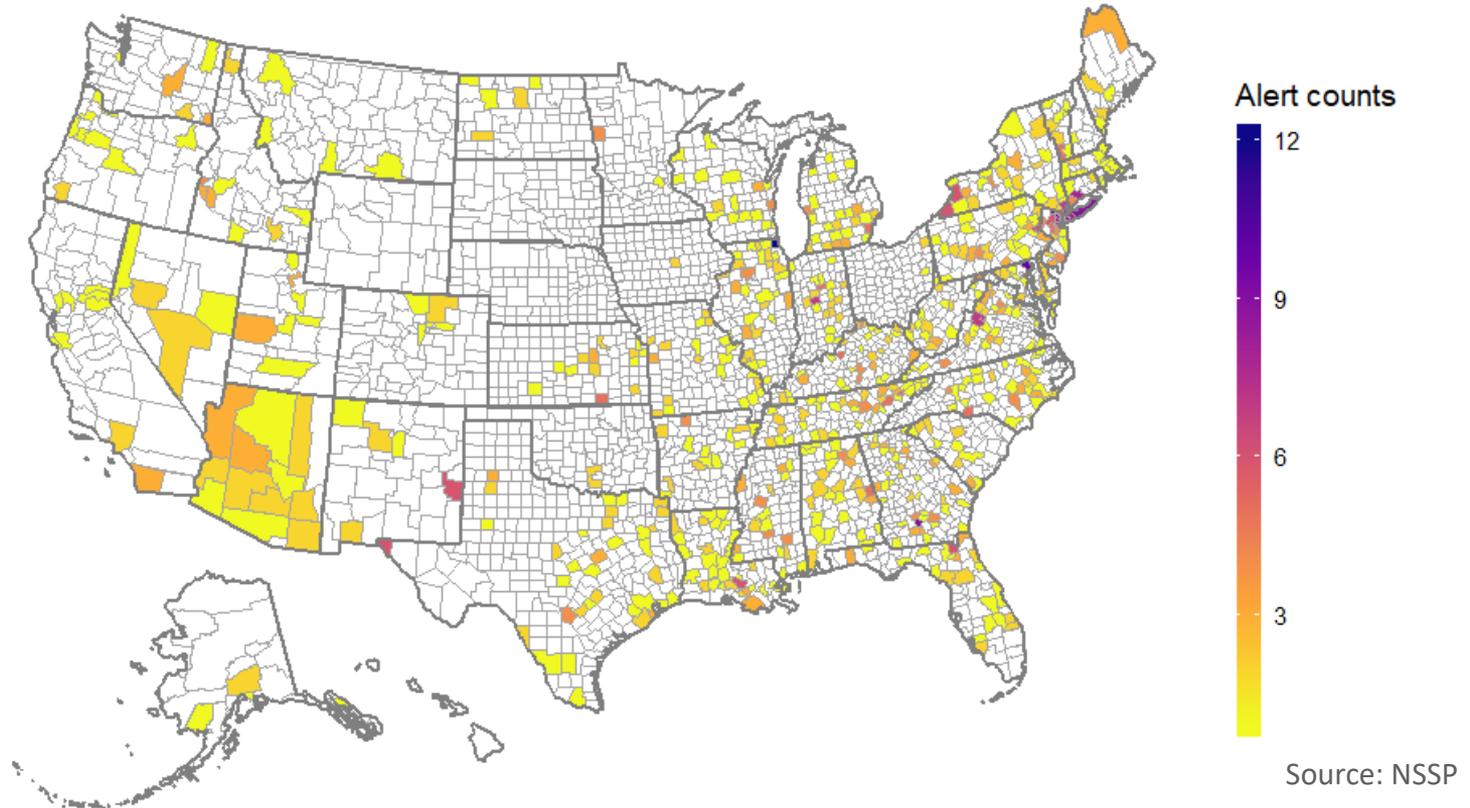
Keep sharing your interesting findings, please! We are swamped 😊.”

What are the trends at the county level for CLI and other relevant COVID-like illness syndromes? (NRCC/White House)



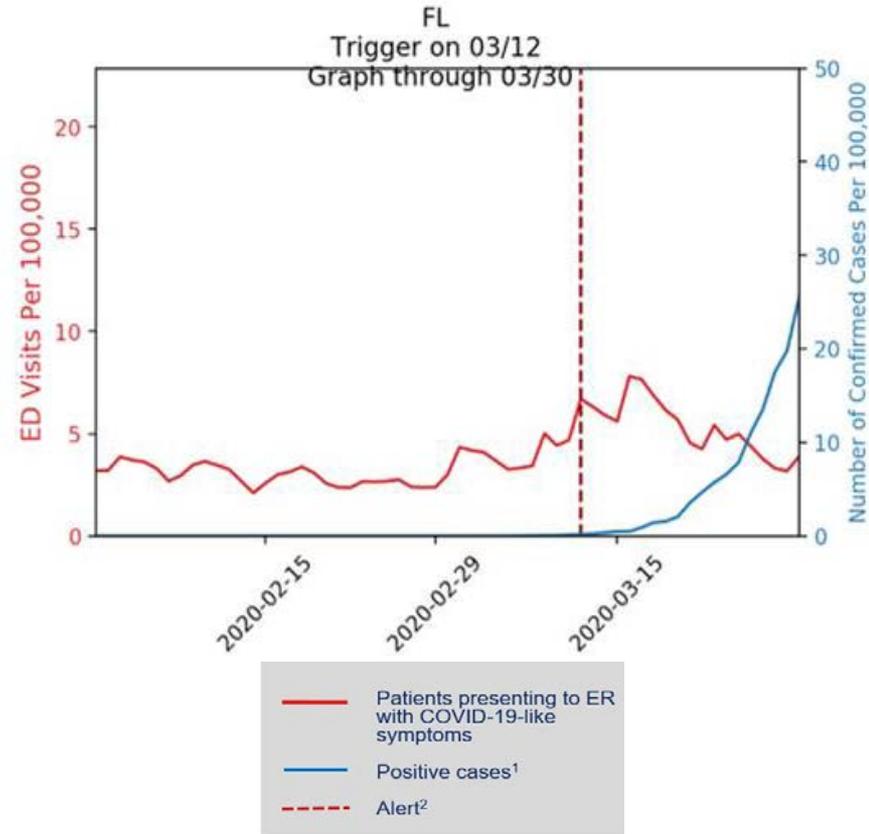
How can the NSSP data be used for hotspot analysis? (CDC/NRCC)

CLI 3-day Alert Counts: March 30, 2020 – April 2, 2020



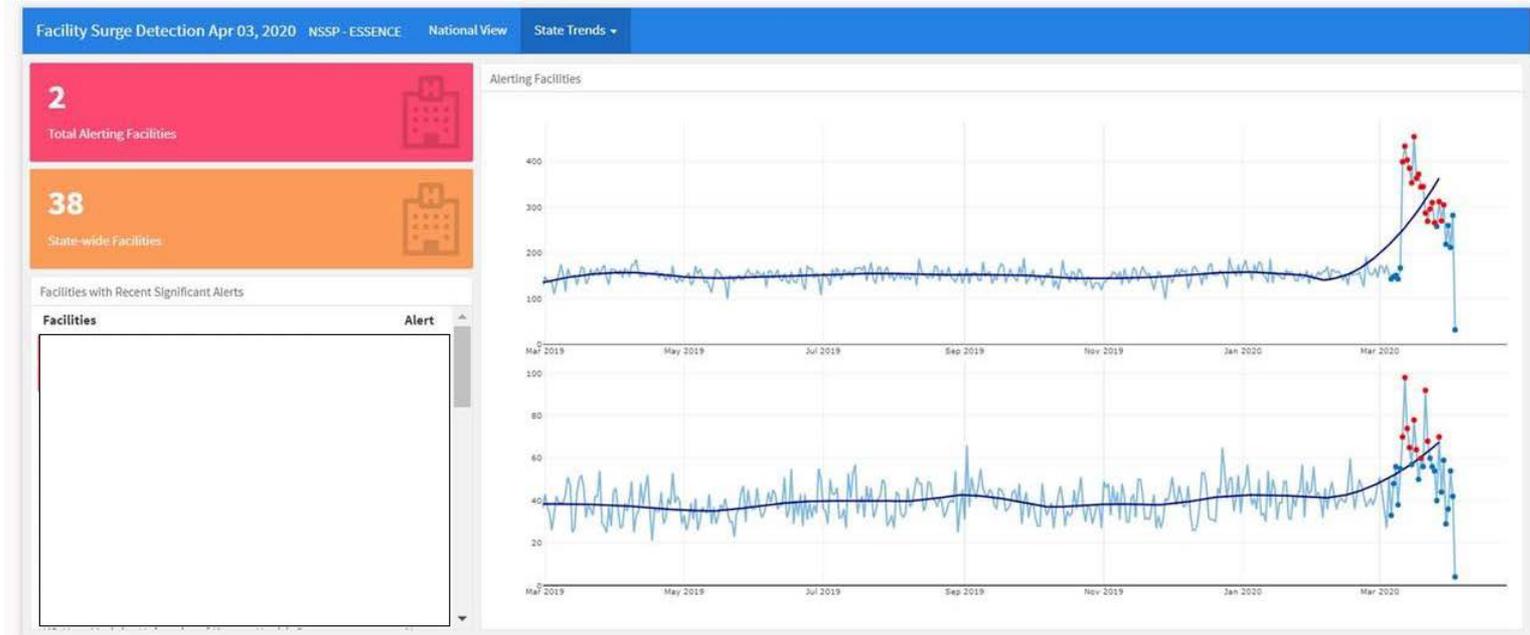
Do syndromic data on COVID-like illness (CLI) provide a leading indicator of COVID infections? (NRCC)

- NRCC analysts worked with us on queries to pull from ESSENCE for CLI and ILI.
 - Time series results were combined with confirmed cumulative case counts by site.
 - ESSENCE anomalies were marked on the time series graph so that alerts could be visually compared with confirmed cases.
- NSSP is now replicating process to include laboratory data.



How can syndromic data inform hospital surge?

- Provider Health Systems & Worker Safety Task Force with facility volume alert report to inform the EOC where facilities are potentially getting overwhelmed and may need resource assistance.



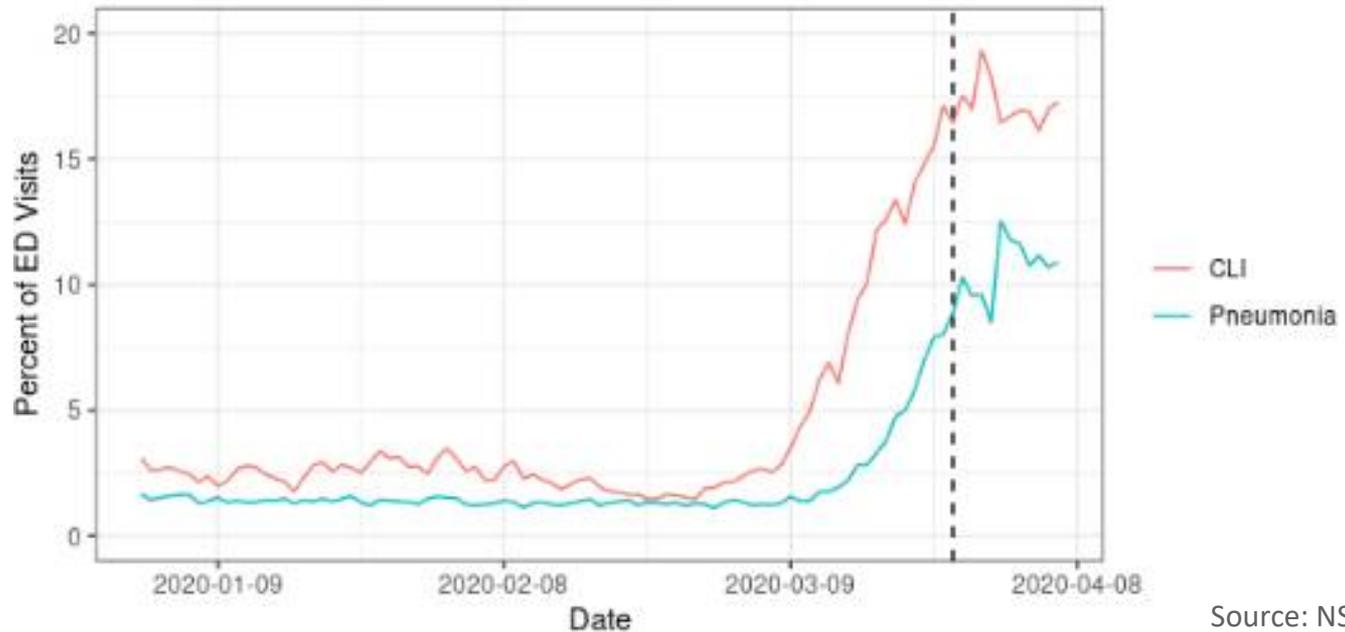
How will we know when the situation is improving?

- To detect recent and significant shifts in trends as well as to classify the shift as increasing or decreasing, Nssp applied a binomial regression to a recent subset of time series data.
- The corresponding Wald test resulted in two pieces of information:
 - The sign of the test statistic allows for classification of increase or decrease.
 - The p-value points to significance of the change given it is below 0.01.
- This methodology allowed automated classification for a large number of stratified time series (i.e., by site or county), circumventing manual inspection.

Analyzed trend of percent of ED visits with expanded CLI and pneumonia

NYC CLI and Pneumonia - Percent ED Visits

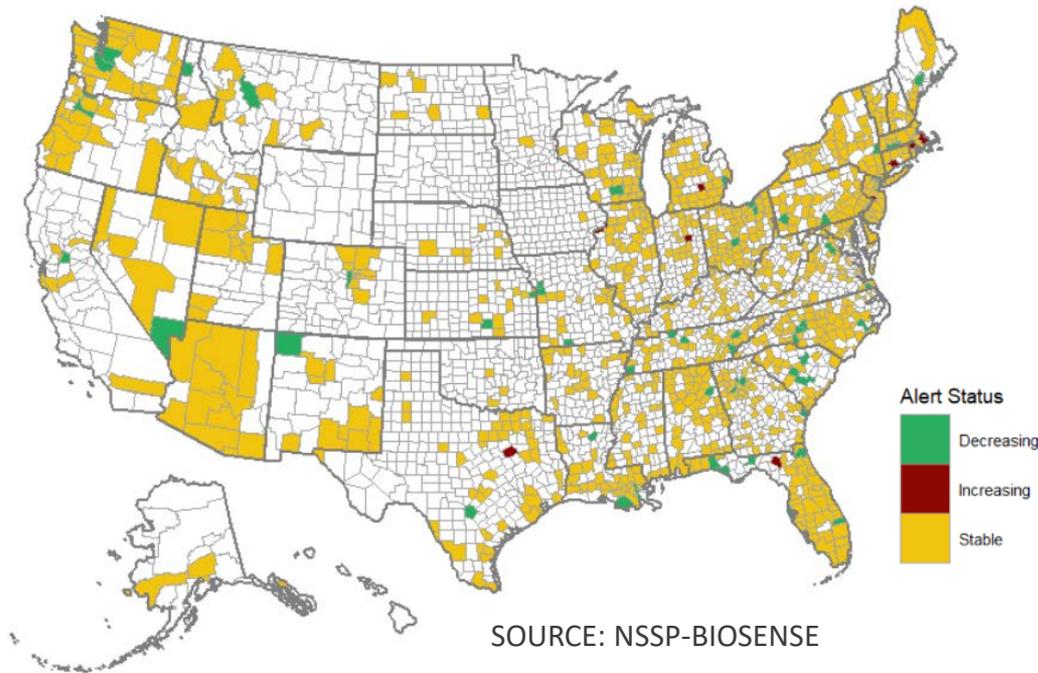
No Significant Change for CLI, Increase in Pneumonia in Trend Over March 26, 2020 to April 06, 2020



Source: Nssp

Status of Expanded COVID-like Illness (CLI) Syndrome among ED Visits by County

CLI CC or DD: March 26, 2020 - April 06, 2020



County Status from 3/26-4/6:

- ▼ 64 (6%) counties decreased
- ▲ 10 (0.01%) counties increased
- 916 (93%) counties stabilized

CLI OR Diagnosis Codes for Coronavirus Syndrome Definition:

Includes: fever plus cough, difficulty breathing, shortness of breath OR coronavirus diagnostic codes

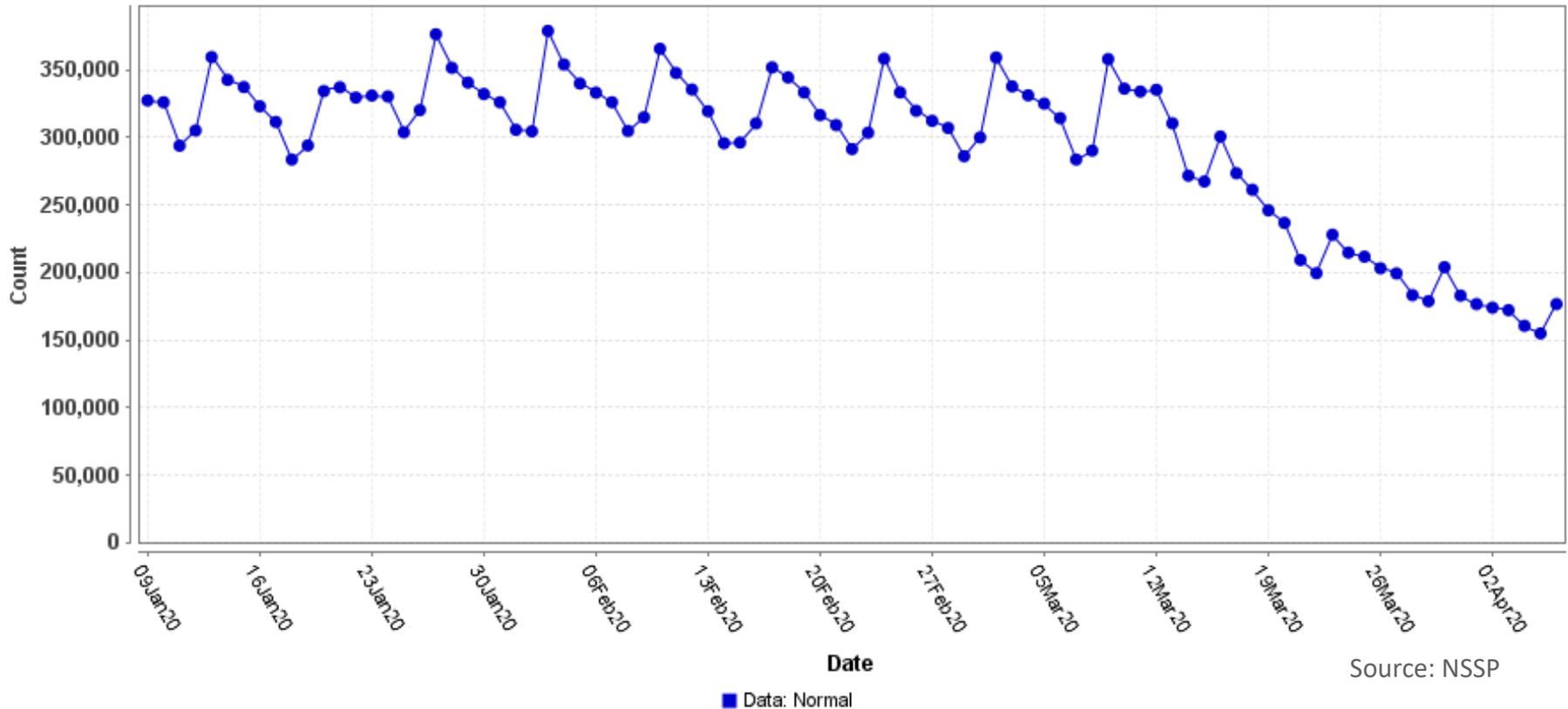
Excludes: influenza diagnostic code

CC=chief complaint

DD=discharge diagnosis

ED volume dropped with onset of social distancing

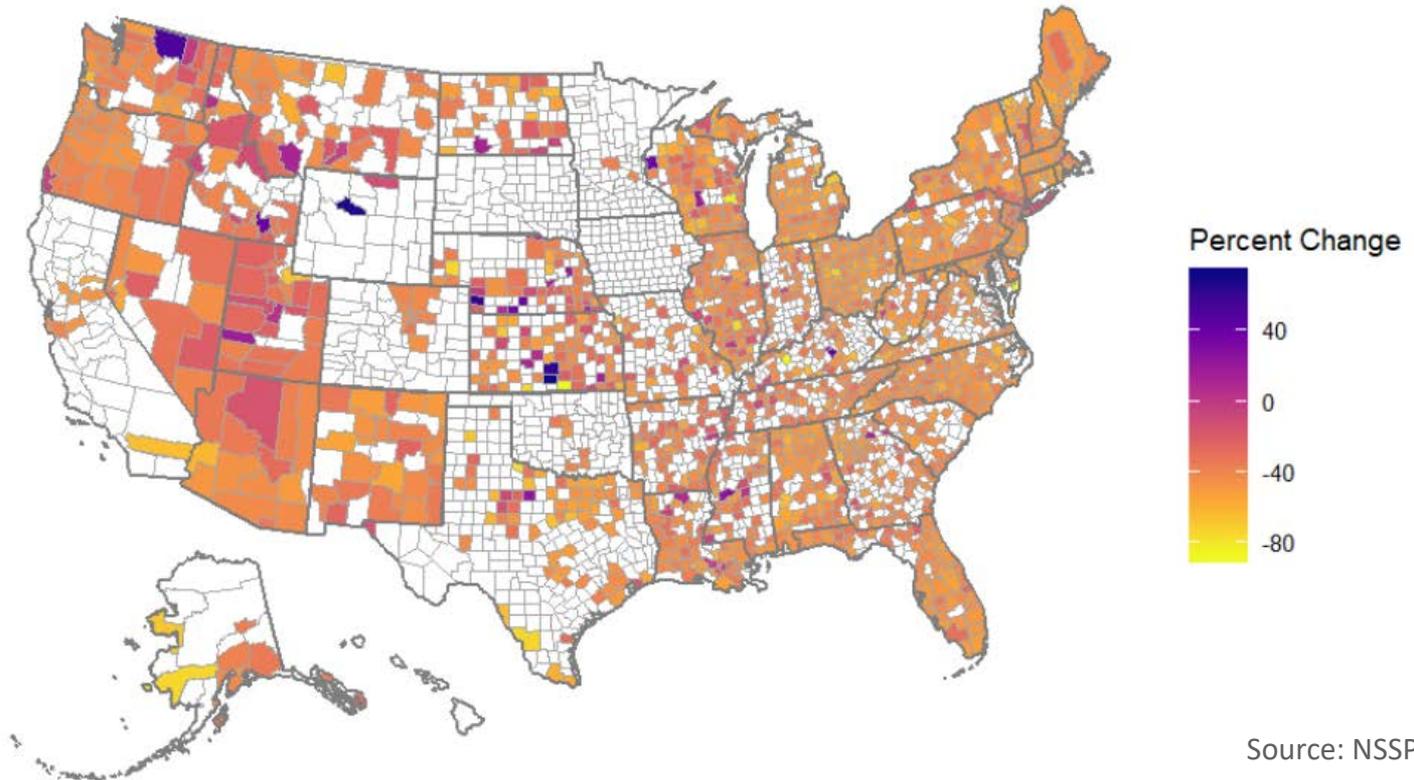
Daily Emergency Department Volume Changes



Source: NSSP

Analysis strategy addresses changing ED volume

Percent Change of Emergency Department Volume by County



Commercial lab data: February 2020

- Data for all reportable conditions and drug tests from one company
- In NSSP-ESSENCE staging for data quality checks
- Rollout to states in development

And then, on March 5 ...

From: Lab COVID-19 public health reporting
Subject: Lab data going live

Good afternoon,
Lab data will be going live with the COVID-19 test tonight.

April 2020

- Six lab companies sending COVID-19 data to ESSENCE
- Informing states, CDC, FEMA National Response Coordination Center (NRCC), White House leadership, public
- Team of at least 20 developers, data coordinators, analysts, lab experts

Commercial lab data flow

Three labs daily CSV files to CDC

Three labs direct HL7 feeds



Daily quality checks, fixes, analyses, additions,
harmonization



NESP-ESSENCE system



Daily
situation
report for
CDC EOC
and NRCC

HHS
Protects
view

CDC
public
web site

State health
department
dashboard
in NESP-
ESSENCE

Alerts to
states on
orders from
nursing
homes

Modeling
and hot spot
analyses

R Shiny
dashboard

Nursing home alerts

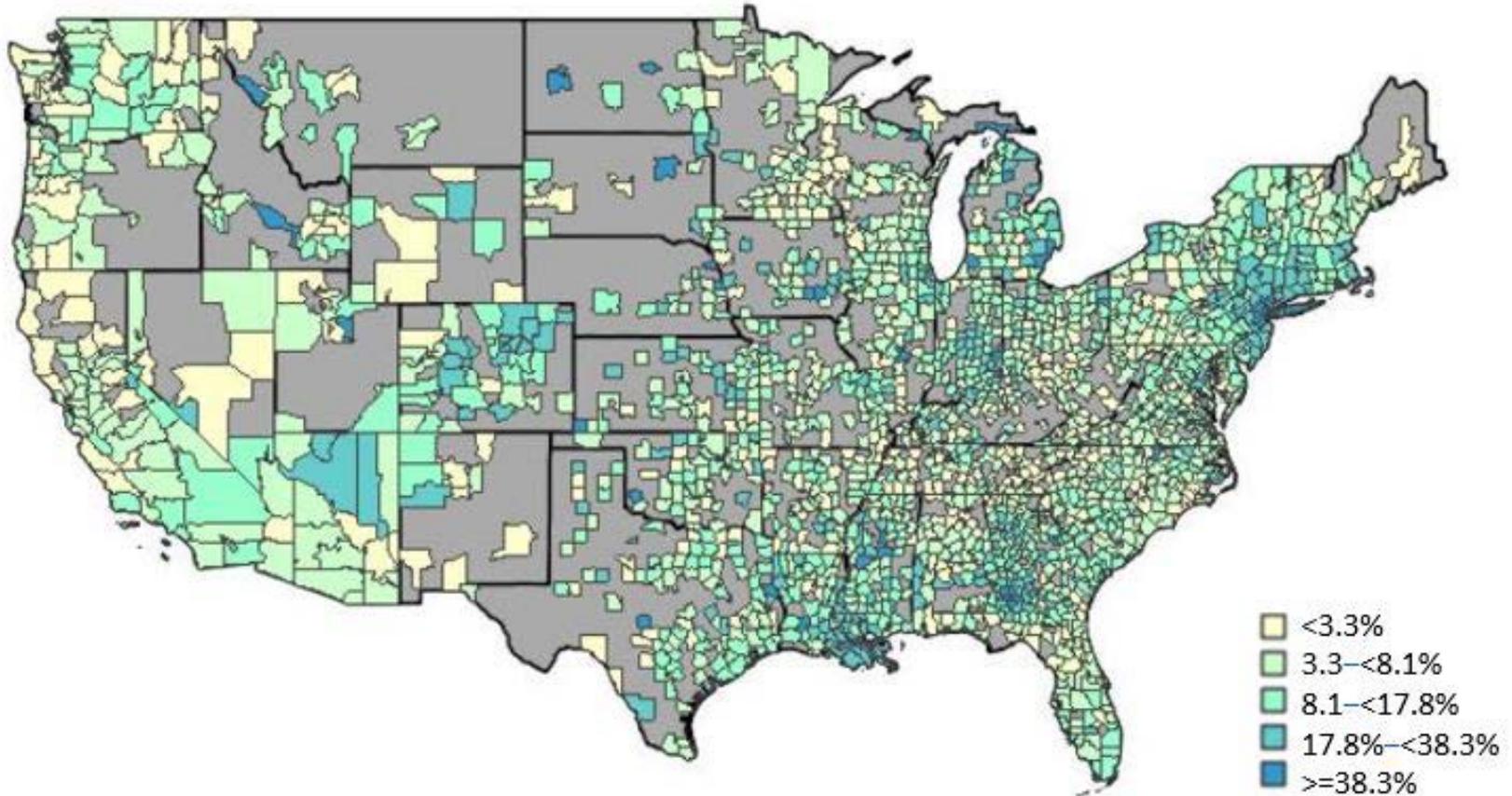
From: State

Sent: Tuesday, April 7, 2020 5:27 PM

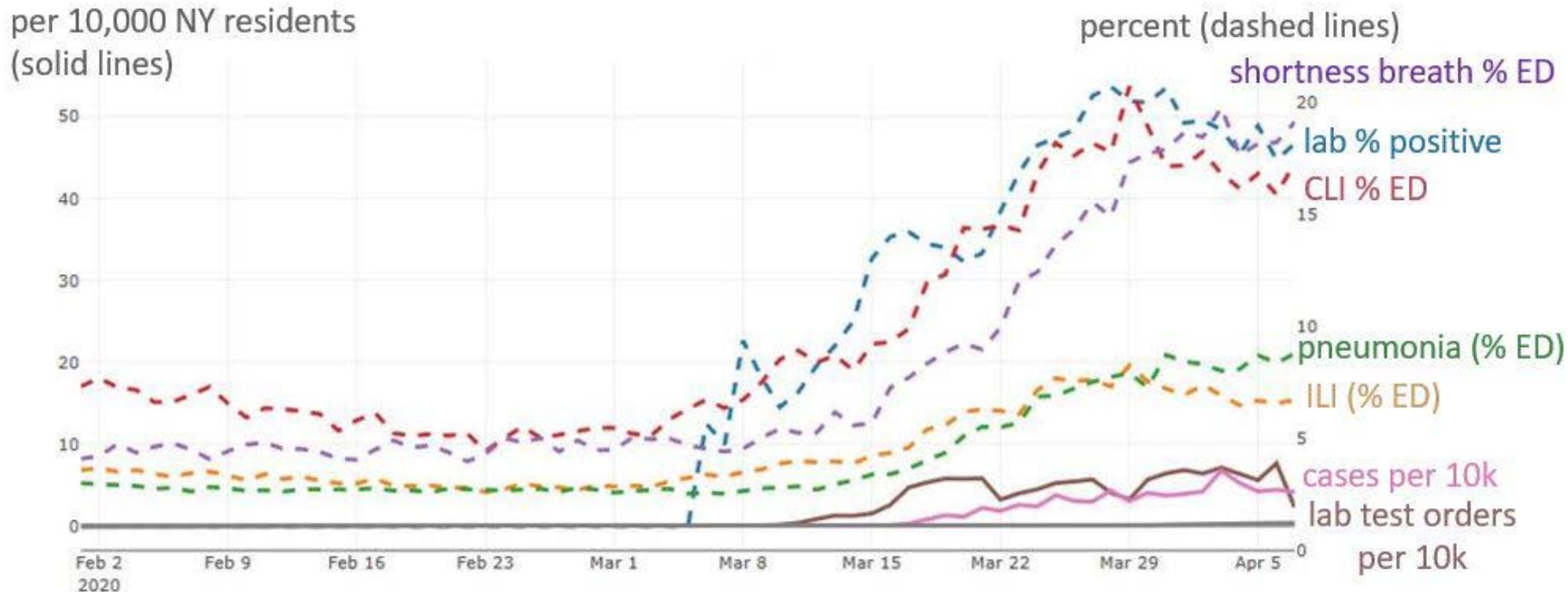
Hello NSSP,

If it isn't too much burden, it would be great to continue to be notified of pending orders. We are having our infection control team conduct assessments at these facilities to help them further strategize containment efforts. At this point in time, we can still continue to do them for pending results. We will ultimately have to move to just positive results, but these are extremely helpful at this time.

ESSENCE Dashboard: Percent lab test positive by county January 1, 2020 to April 14, 2020



Next: Finding best early indicator of pandemic severity



Source: NSSP



For more information, contact CDC
1-800-CDC-INFO (232-4636)
TTY: 1-888-232-6348 www.cdc.gov

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

