

COVID-19: U.S. STUDY SUMMARY

March 30, 2020

Executive Summary

RESULTS SUMMARY:

Growth in Dataminr-detected clusters of eyewitness, on-the-ground, first-hand public social media posts on COVID-19 can be a leading indicator of virus outbreak hotspots in the U.S. **7-15** days prior to exponential growth in COVID-19 official case count.

STUDY METHODOLOGY:

Dataminr's AI Platform detected social media COVID-19 clusters comprised of public social media posts ranging from people indicating they tested positive, people indicating they are experiencing symptoms, people indicating they have been exposed but not tested, first-hand accounts of confirmed cases from relatives, friends, and colleagues as well as COVID-19 related supply shortages and closures.

Key Findings

01

Growth in public social media clusters has occurred 7-15 days prior to exponential growth in COVID-19 confirmed case count in U.S. states currently experiencing a severe outbreak:

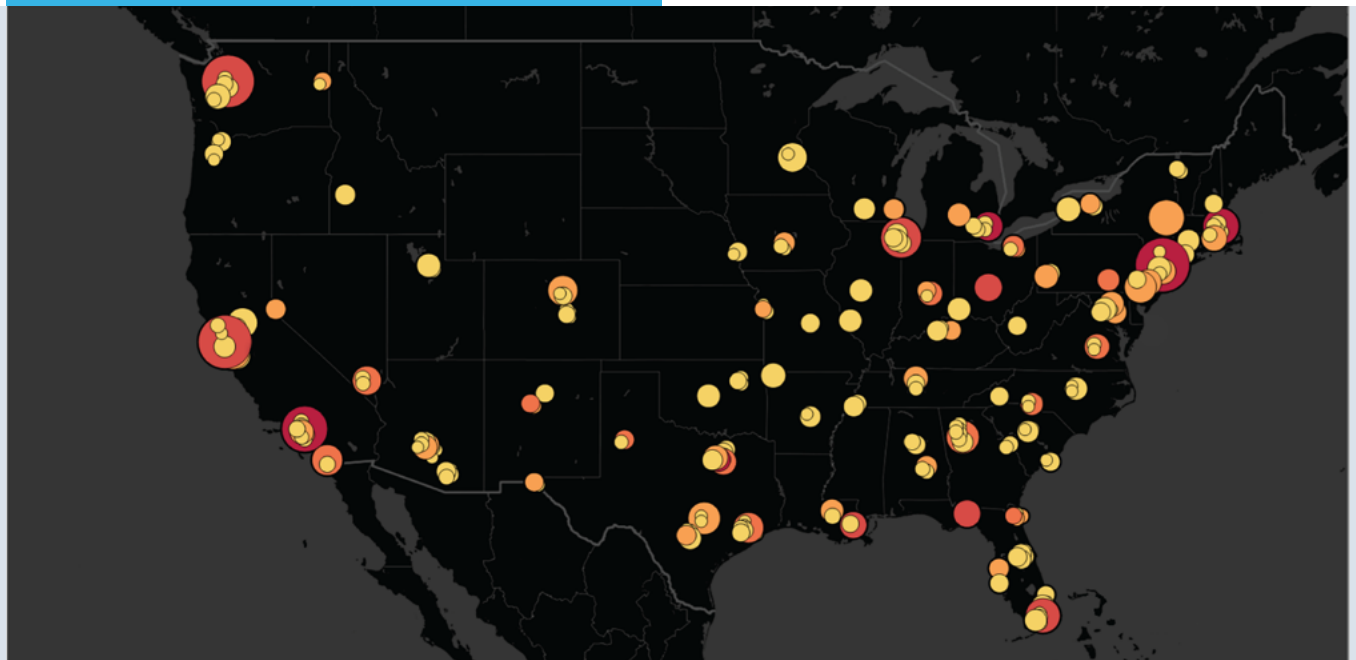
New York (15 days ahead)	New Jersey (14 days ahead)
California (7 days ahead)	Massachusetts (15 days ahead)
Florida (9 days ahead)	Pennsylvania (14 days ahead)
Louisiana (12 days ahead)	Texas (8 days ahead)
Washington (10 days ahead)	Illinois (8 days ahead)

02

Dataminr has detected exponential social media cluster growth in 14 U.S. states that do not yet have a spike in COVID-19 case counts:

Alabama	Minnesota	South Carolina
Arizona	Missouri	Tennessee
Indiana	Nevada	Utah
Kentucky	North Carolina	Virginia
Maryland	Ohio	

138 COVID-19 Social Media Clusters* Detected Across the United States



As of March 29

Lower
Severity



Higher
Severity

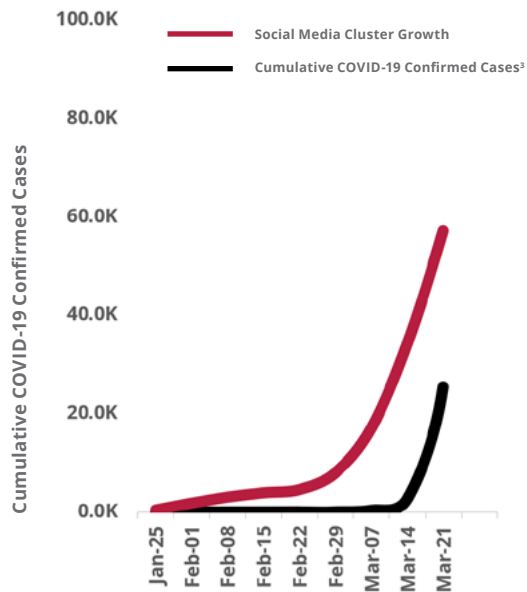
Lower
Growth



Higher
Growth

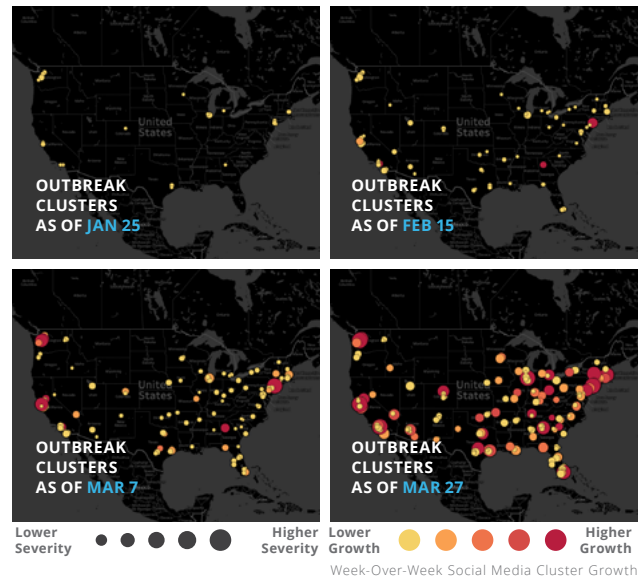
*These outbreak clusters represent clusters of organic, on-the-ground public social media posts ranging from people indicating they tested positive for CV, people indicating they are experiencing symptoms of CV, people indicating they have been exposed to CV but not tested, and first-hand accounts of confirmed CV cases from relatives, friends, and colleagues as well as related supply shortages and closures.

United States Case Study

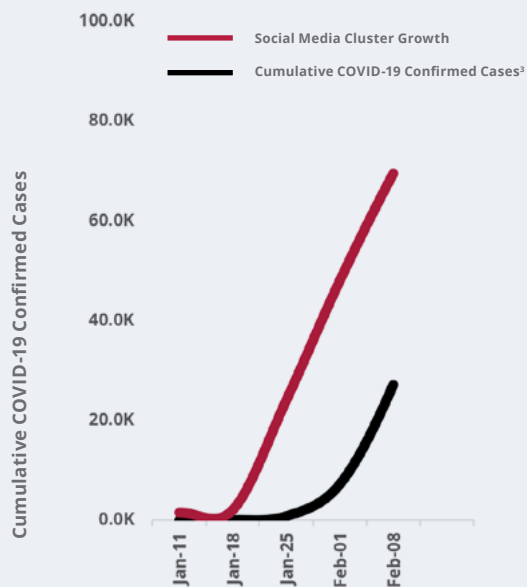


Exponential growth in social media outbreak clusters occurred **14 days** prior to exponential growth in COVID-19 case count (Distance Correlation=0.90)¹

COVID-19 Social Media Clusters² Detected

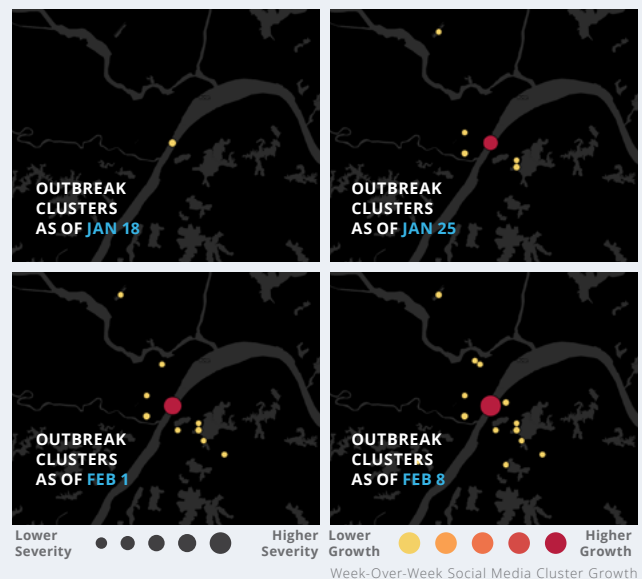


Wuhan (Hubei Province) Case Study



Exponential growth in social media clusters occurred **12 days** prior to exponential growth in COVID-19 case count (Distance Correlation=0.61)¹

COVID-19 Social Media Clusters² Detected



Note: Social Media Cluster Growth in above graph is depicted on a secondary scale

1 Distance Correlation is a similarity measure in [0,1] that measures non-linear correlations between time two series

2 These alert clusters represent clusters of organic, on-the-ground public social media posts ranging from people indicating they tested positive for CV, people indicating they are experiencing symptoms of CV, people indicating they have been exposed to CV but not tested, and first hand accounts of confirmed CV cases from relatives, friends, and colleagues as well as related supply shortages and closures.

3 Data sourced from Johns Hopkins CSSE, World Health Organization, CDC for research purposes

WUHAN DETECTION

Dec. 30, 2019



"Coronavirus" in public social media

DATAMINR ALERT

DEC 30, 2019 9:11 a.m. EST
新一波SARS在武汉汉口悄然蔓延
Another SARS is spreading
quietly in Hankou Wuhan



Image of healthcare workers
disinfecting Huanan's seafood market

DATAMINR ALERT

DEC 30, 2019 9:21 p.m. EST
武汉发现sars?#sars SARS is
discovered in Wuhan? #sars

DATAMINR ALERT

DEC 30, 2019 10:09 p.m. EST
7 SARS cases reportedly confirmed
in Wuhan, where China built its first
BSL-4 lab

January 1, 2020

JAN 6, 2020

US Centers for Disease Control
and Prevention Notified the Public

JAN 9, 2020

World Health Organization
Notified the Public

February 2020

JAN 11, 2020

The U.S. Centers for Disease Control and Prevention
announces that there might be a new type of
pneumonia in Wuhan
WHO gets genetic sequences of the disease

March 2020

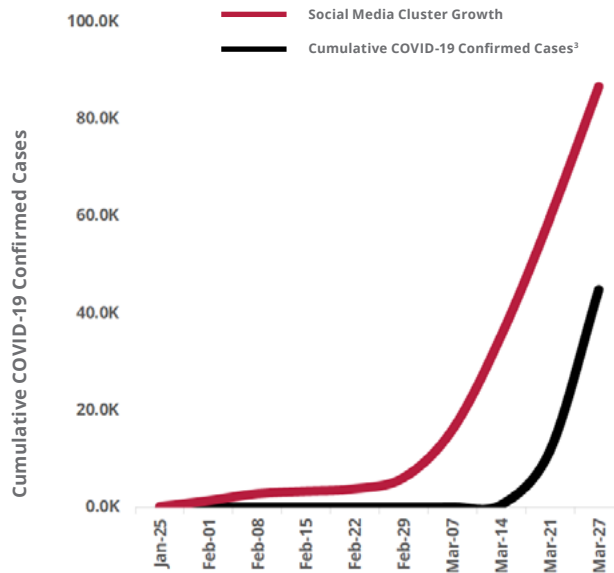
Dataminr detected the initial outbreak at 9:11 a.m. on the morning of **Dec. 30, 2019**, ahead of all other virus warning systems.



STATE-BY-STATE CASE STUDIES

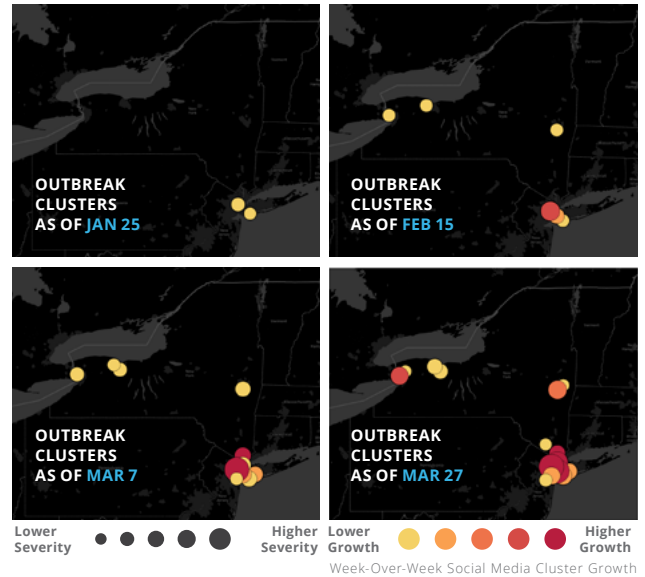
COVID-19 Outbreak States

01 New York Case Study

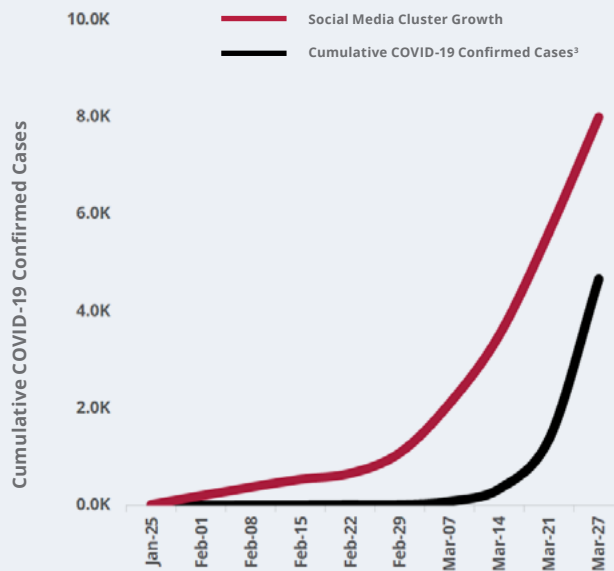


Exponential growth in social media clusters occurred **15 days** prior to exponential growth in COVID-19 case count (Distance Correlation=0.87)¹

COVID-19 Social Media Clusters² Detected

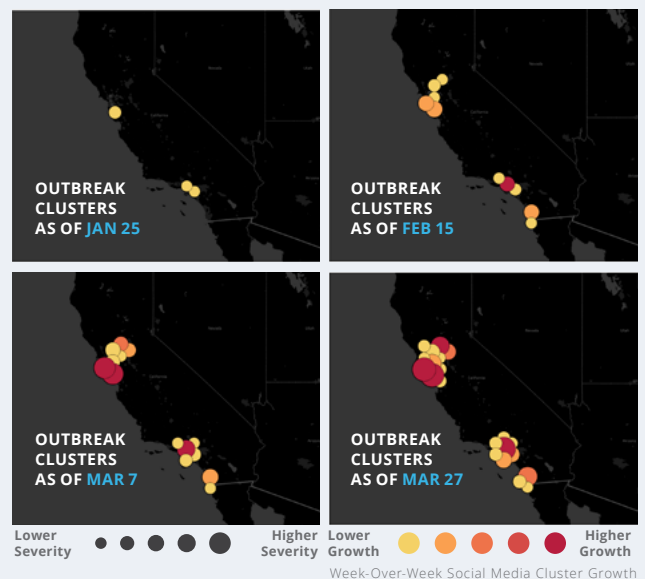


02 California Case Study



Exponential growth in social media clusters occurred **7 days** prior to exponential growth in COVID-19 case count (Distance Correlation=0.86)¹

COVID-19 Social Media Clusters² Detected



Note: Social Media Cluster Growth in above graph is depicted on a secondary scale

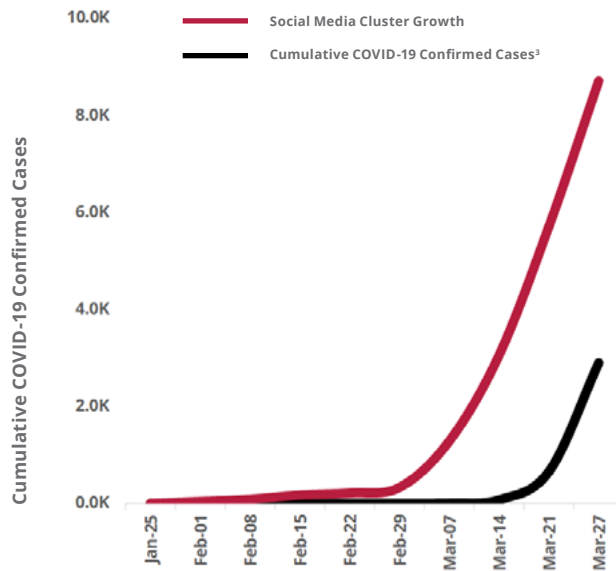
¹ Distance Correlation is a similarity measure in [0,1] that measures non-linear correlations between time two series

² These alert clusters represent clusters of organic, on-the-ground public social media posts ranging from people indicating they tested positive for CV, people indicating they are experiencing symptoms of CV, people indicating they have been exposed to CV but not tested, and first hand accounts of confirmed CV cases from relatives, friends, and colleagues as well as related supply shortages and closures.

³ Data sourced from Johns Hopkins CSSE, World Health Organization, CDC for research purposes

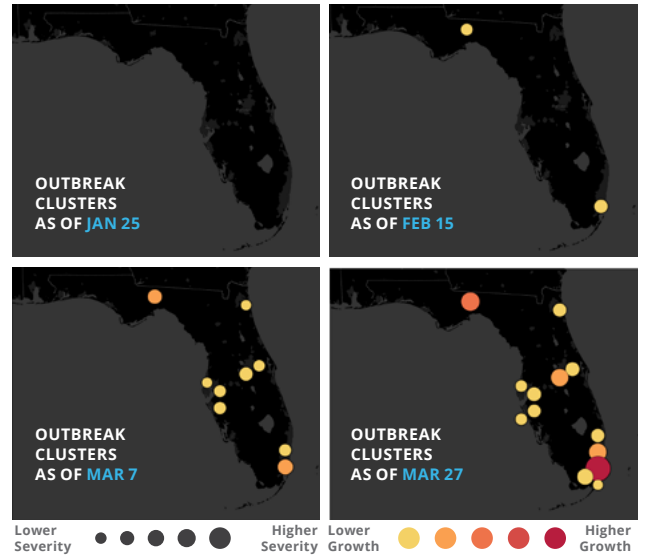
03

Florida Case Study



Exponential growth in social media clusters occurred **9 days** prior to exponential growth in COVID-19 case count (Distance Correlation=0.88)¹

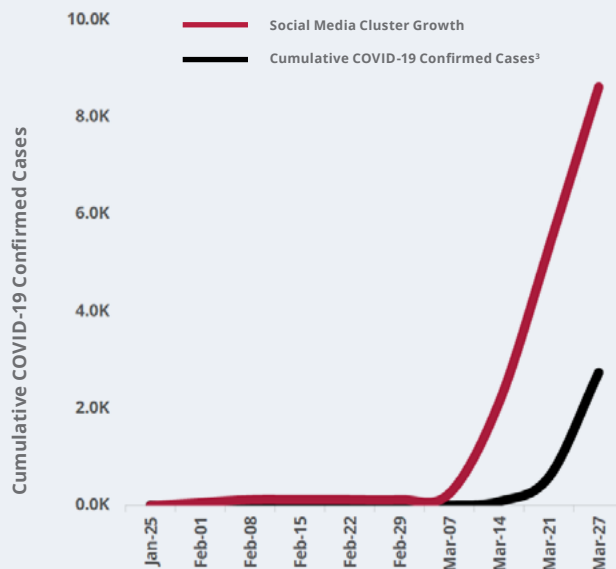
COVID-19 Social Media Clusters² Detected



Week-Over-Week Social Media Cluster Growth

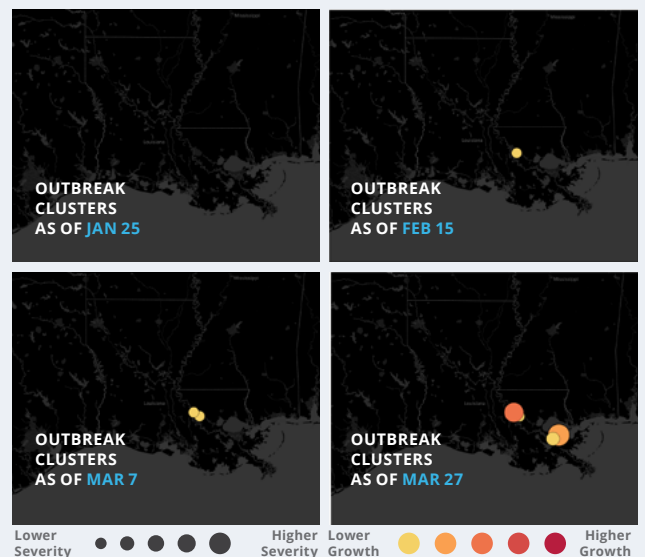
04

Louisiana Case Study



Exponential growth in social media clusters occurred **12 days** prior to exponential growth in COVID-19 case count (Distance Correlation=0.90)¹

COVID-19 Social Media Clusters² Detected



Week-Over-Week Social Media Cluster Growth

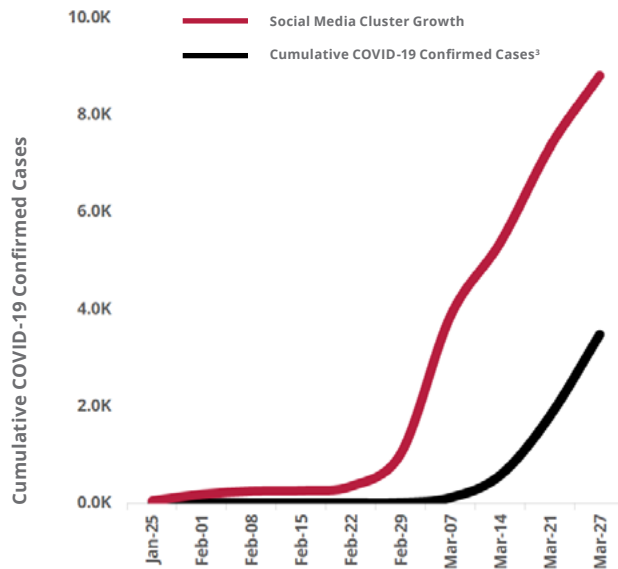
Note: Social Media Cluster Growth in above graph is depicted on a secondary scale

¹ Distance Correlation is a similarity measure in [0,1] that measures non-linear correlations between time two series

² These alert clusters represent clusters of organic, on-the-ground public social media posts ranging from people indicating they tested positive for CV, people indicating they are experiencing symptoms of CV, people indicating they have been exposed to CV but not tested, and first hand accounts of confirmed CV cases from relatives, friends, and colleagues as well as related supply shortages and closures.

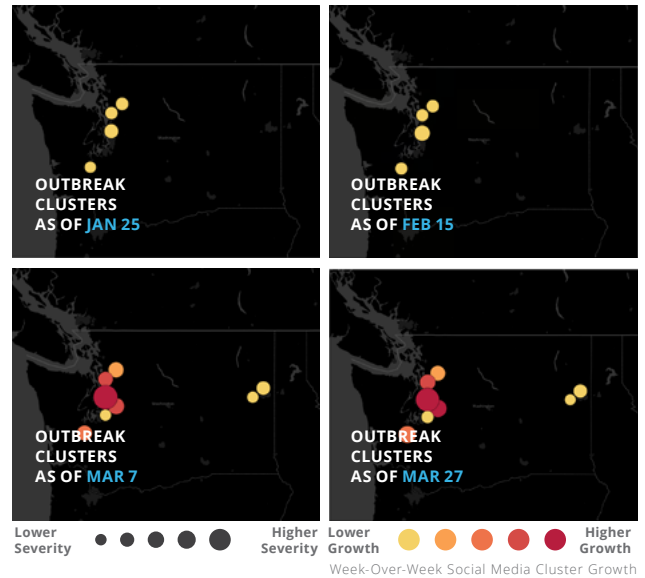
³ Data sourced from Johns Hopkins CSSE, World Health Organization, CDC for research purposes

05 Washington Case Study

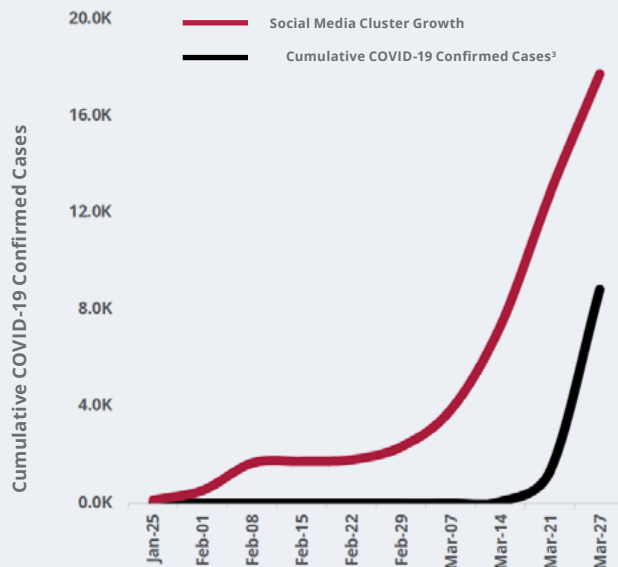


Exponential growth in social media clusters occurred **10 days** prior to exponential growth in COVID-19 case count (Distance Correlation=0.73)¹

COVID-19 Social Media Clusters² Detected

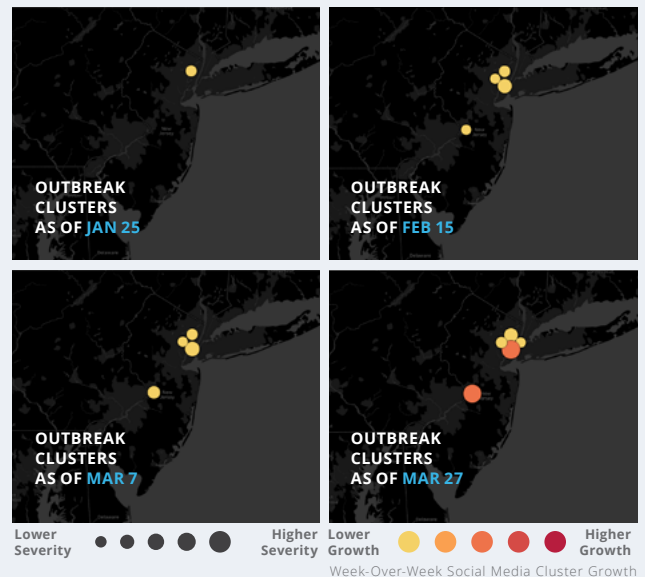


06 New Jersey Case Study



Exponential growth in social media clusters occurred **14 days** prior to exponential growth in COVID-19 case count (Distance Correlation=0.78)¹

COVID-19 Social Media Clusters² Detected



Note: Social Media Cluster Growth in above graph is depicted on a secondary scale

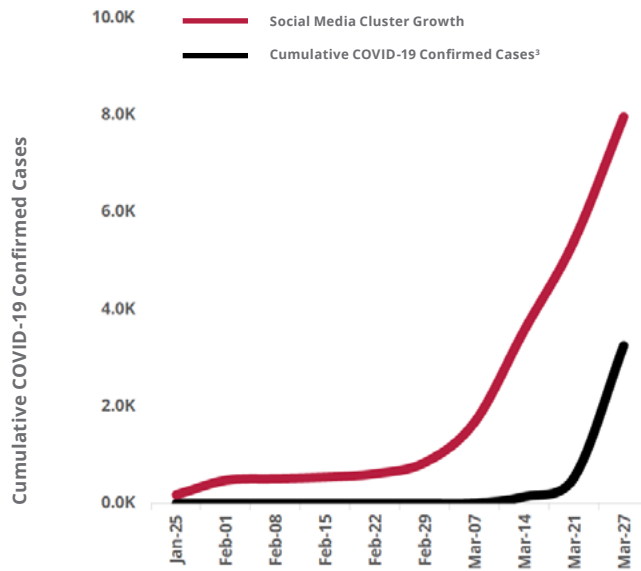
¹ Distance Correlation is a similarity measure in [0,1] that measures non-linear correlations between time two series

² These alert clusters represent clusters of organic, on-the-ground public social media posts ranging from people indicating they tested positive for CV, people indicating they are experiencing symptoms of CV, people indicating they have been exposed to CV but not tested, and first hand accounts of confirmed CV cases from relatives, friends, and colleagues as well as related supply shortages and closures.

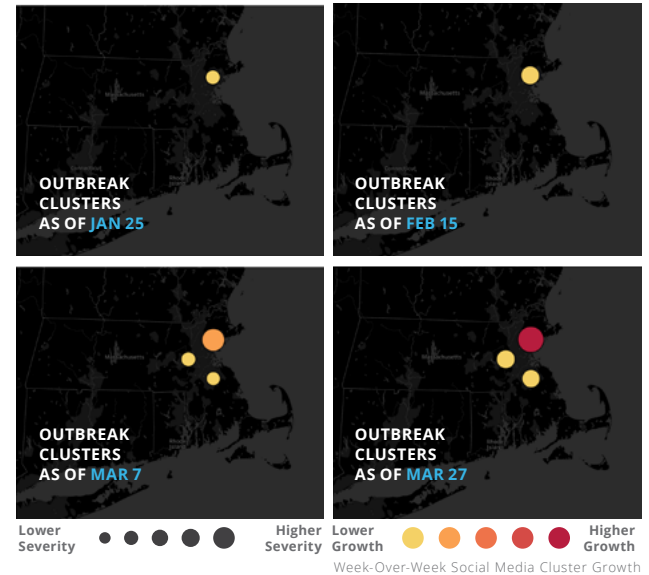
³ Data sourced from Johns Hopkins CSSE, World Health Organization, CDC for research purposes

07 Massachusetts Case Study

Exponential growth in social media clusters occurred **15 days** prior to exponential growth in COVID-19 case count (Distance Correlation=0.78)¹

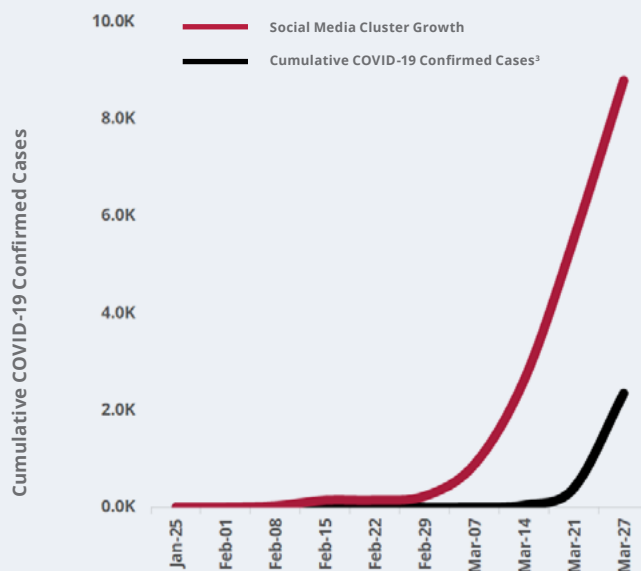


COVID-19 Social Media Clusters² Detected

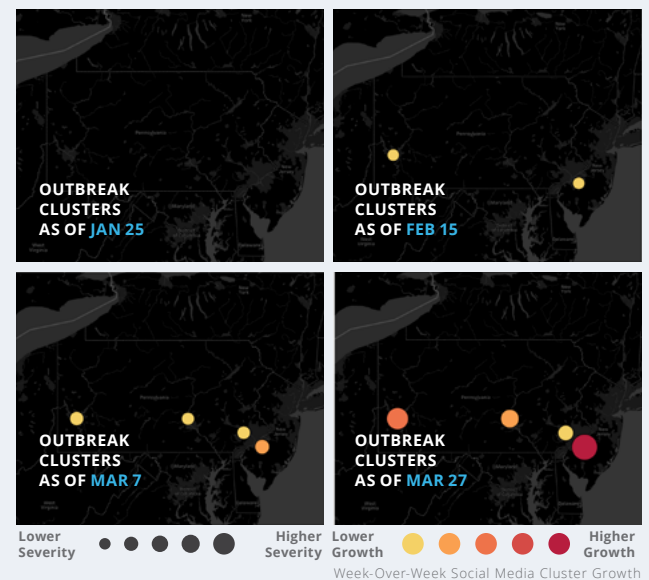


08 Pennsylvania Case Study

Exponential growth in social media clusters occurred **14 days** prior to exponential growth in COVID-19 case count (Distance Correlation=0.90)¹



COVID-19 Social Media Clusters² Detected



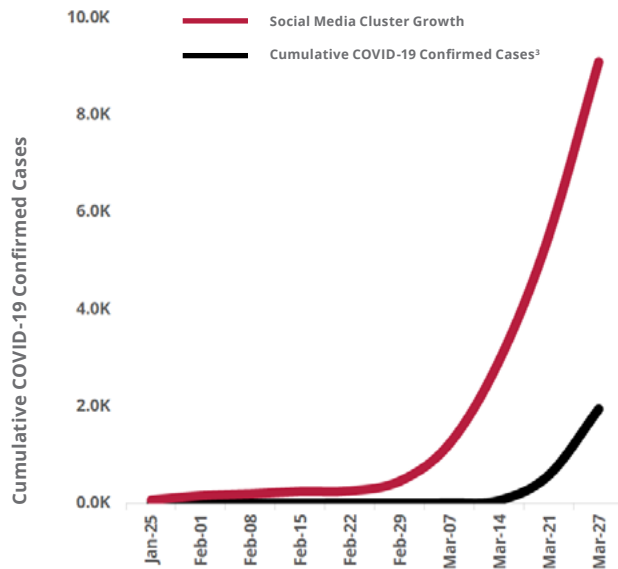
Note: Social Media Cluster Growth in above graph is depicted on a secondary scale

¹ Distance Correlation is a similarity measure in [0,1] that measures non-linear correlations between time two series

² These alert clusters represent clusters of organic, on-the-ground public social media posts ranging from people indicating they tested positive for CV, people indicating they are experiencing symptoms of CV, people indicating they have been exposed to CV but not tested, and first hand accounts of confirmed CV cases from relatives, friends, and colleagues as well as related supply shortages and closures.

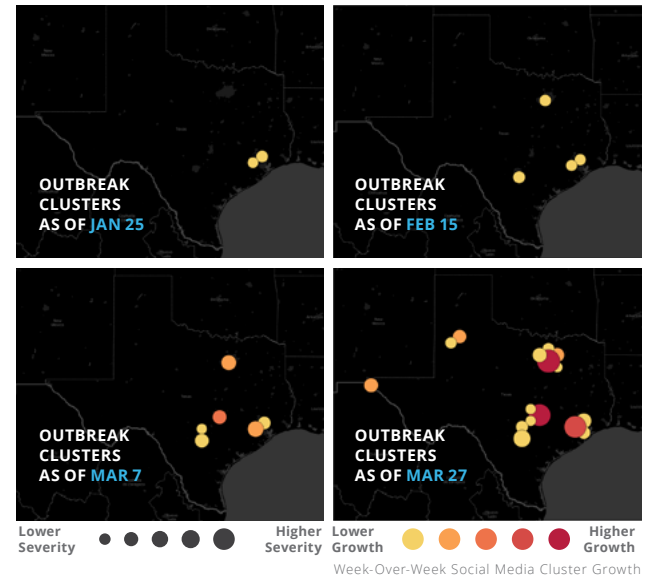
³ Data sourced from Johns Hopkins CSSE, World Health Organization, CDC for research purposes

09 Texas Case Study

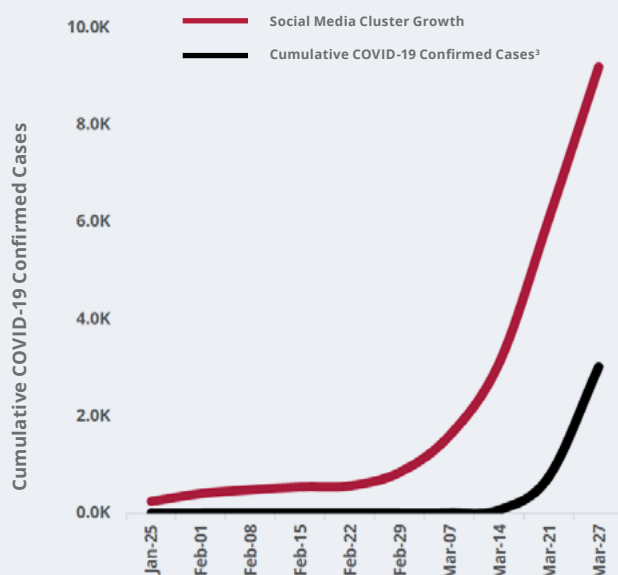


Exponential growth in social media clusters occurred **8 days** prior to exponential growth in COVID-19 case count (Distance Correlation=0.89)¹

COVID-19 Social Media Clusters² Detected

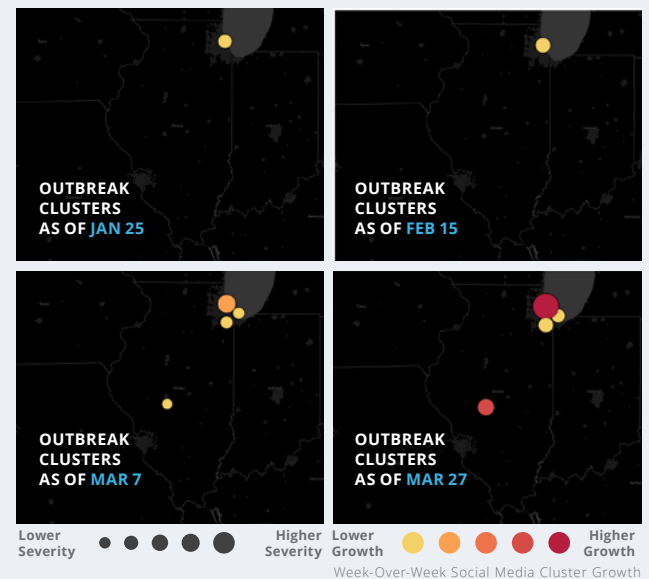


10 Illinois Case Study



Exponential growth in social media clusters occurred **8 days** prior to exponential growth in COVID-19 case count (Distance Correlation=0.83)¹

COVID-19 Social Media Clusters² Detected



Note: Social Media Cluster Growth in above graph is depicted on a secondary scale

¹ Distance Correlation is a similarity measure in [0,1] that measures non-linear correlations between time two series

² These alert clusters represent clusters of organic, on-the-ground public social media posts ranging from people indicating they tested positive for CV, people indicating they are experiencing symptoms of CV, people indicating they have been exposed to CV but not tested, and first hand accounts of confirmed CV cases from relatives, friends, and colleagues as well as related supply shortages and closures.

³ Data sourced from Johns Hopkins CSSE, World Health Organization, CDC for research purposes

STATE-BY-STATE CASE STUDIES

Pre COVID-19
Outbreak States

Pre COVID-19 Outbreak States Showing Exponential Social Media Cluster Growth

Dataminr has detected exponential social media cluster growth in 14 U.S. states that do not yet have a spike in COVID-19 case counts, **suggesting an impending case spike in the below states:**

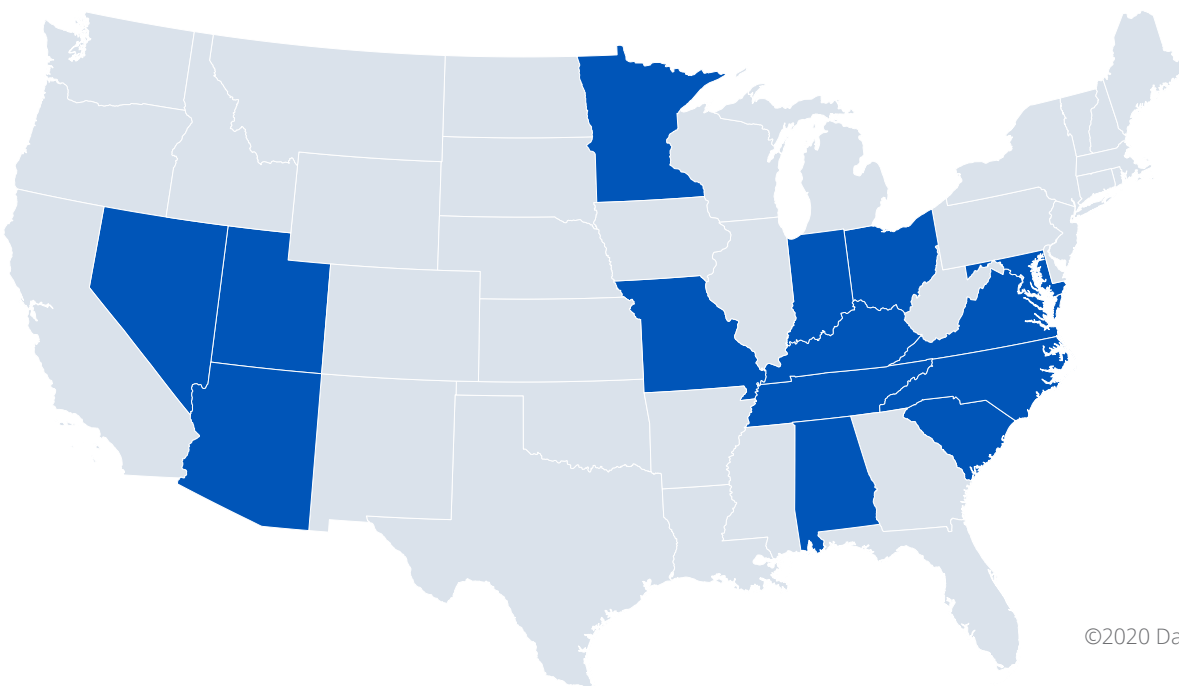
ALABAMA
ARIZONA
INDIANA

KENTUCKY
MARYLAND
MINNESOTA

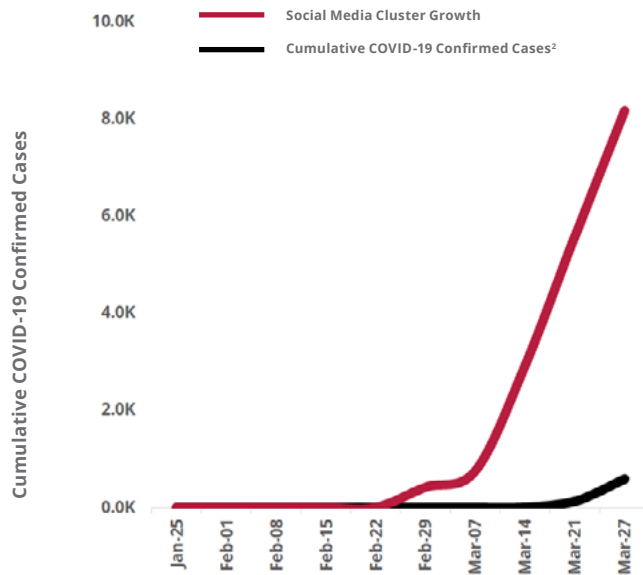
MISSOURI
NEVADA
NORTH CAROLINA

OHIO
SOUTH CAROLINA
TENNESSEE

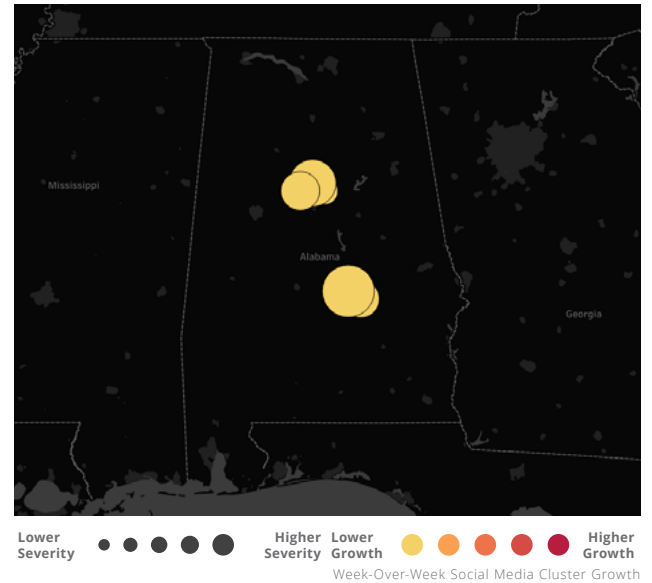
UTAH
VIRGINIA



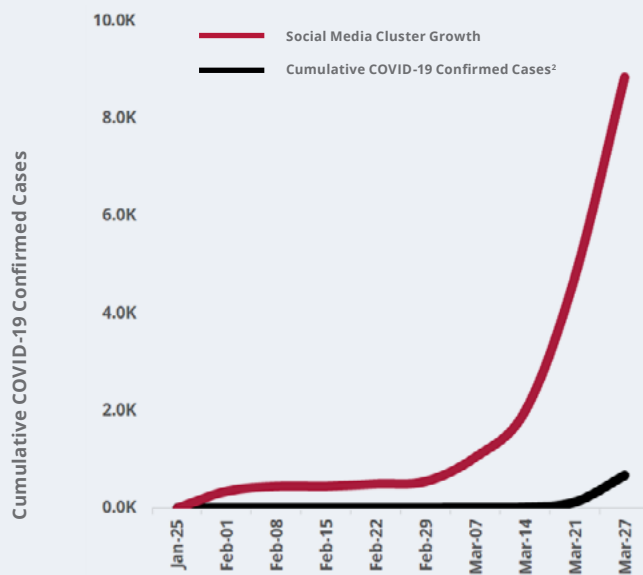
01 Alabama Case Study



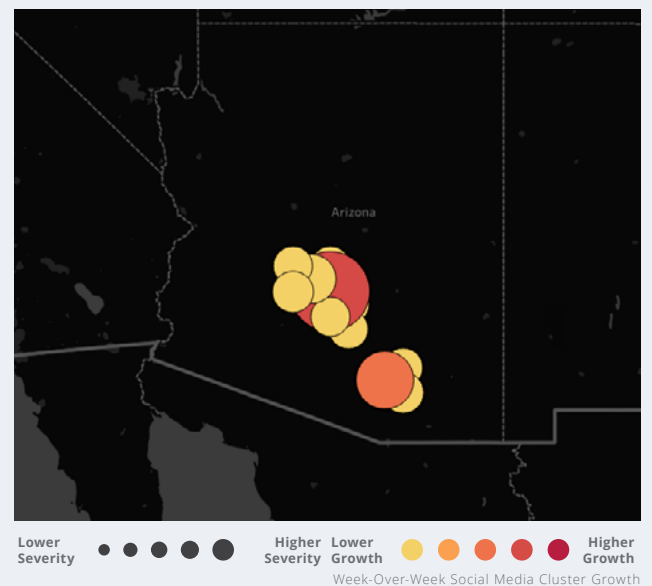
COVID-19 Social Media Clusters¹ Detected



02 Arizona Case Study



COVID-19 Social Media Clusters¹ Detected

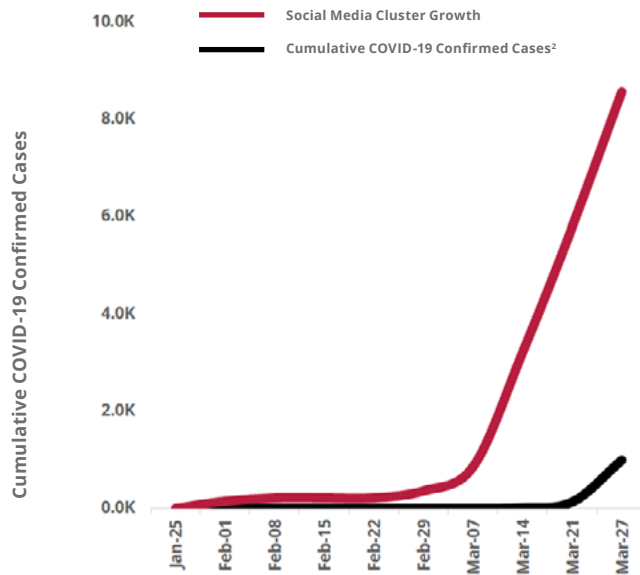


Note: Social Media Cluster Growth in above graph is depicted on a secondary scale

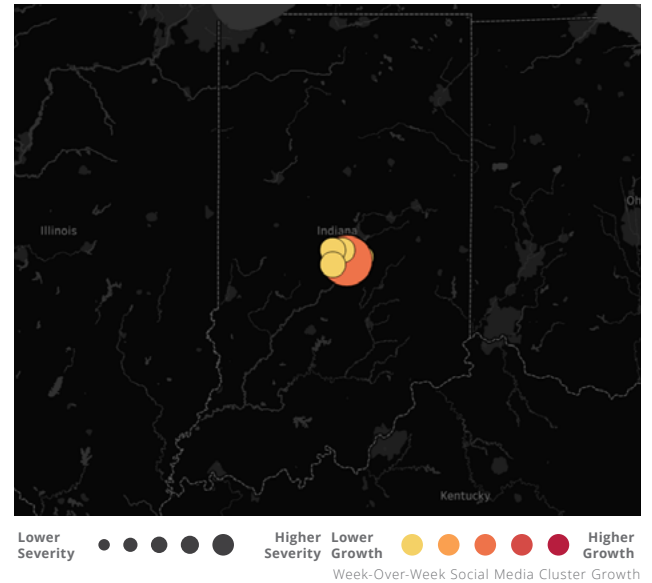
¹ These alert clusters represent clusters of organic, on-the-ground public social media posts ranging from people indicating they tested positive for CV, people indicating they are experiencing symptoms of CV, people indicating they have been exposed to CV but not tested, and first hand accounts of confirmed CV cases from relatives, friends, and colleagues as well as related supply shortages and closures.

² Data sourced from Johns Hopkins CSSE, World Health Organization, CDC for research purposes

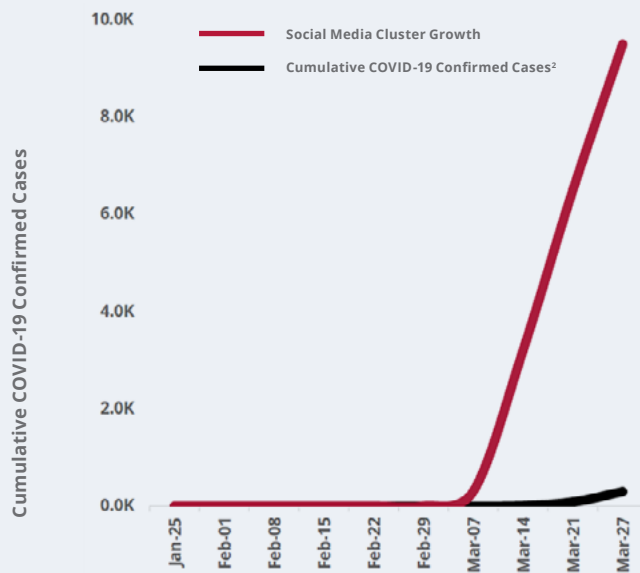
03 Indiana Case Study



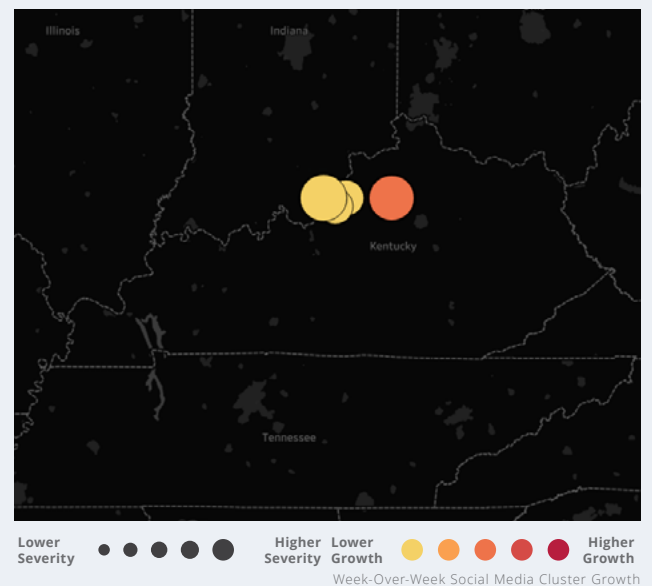
COVID-19 Social Media Clusters¹ Detected



04 Kentucky Case Study



COVID-19 Social Media Clusters¹ Detected



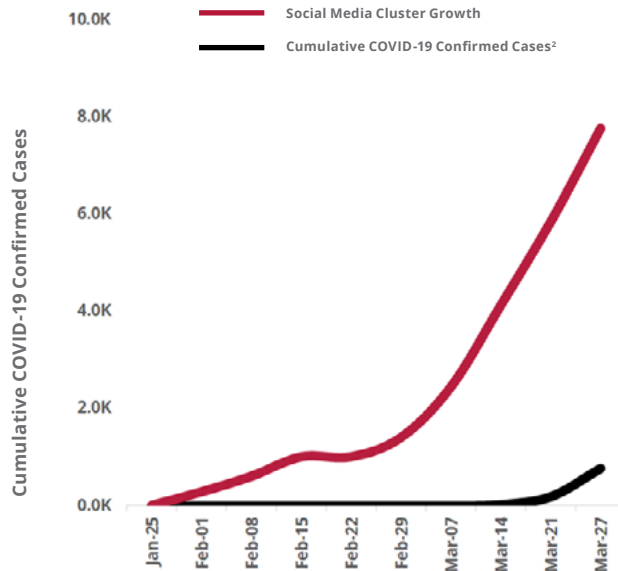
Note: Social Media Cluster Growth in above graph is depicted on a secondary scale

¹ These alert clusters represent clusters of organic, on-the-ground public social media posts ranging from people indicating they tested positive for CV, people indicating they are experiencing symptoms of CV, people indicating they have been exposed to CV but not tested, and first hand accounts of confirmed CV cases from relatives, friends, and colleagues as well as related supply shortages and closures.

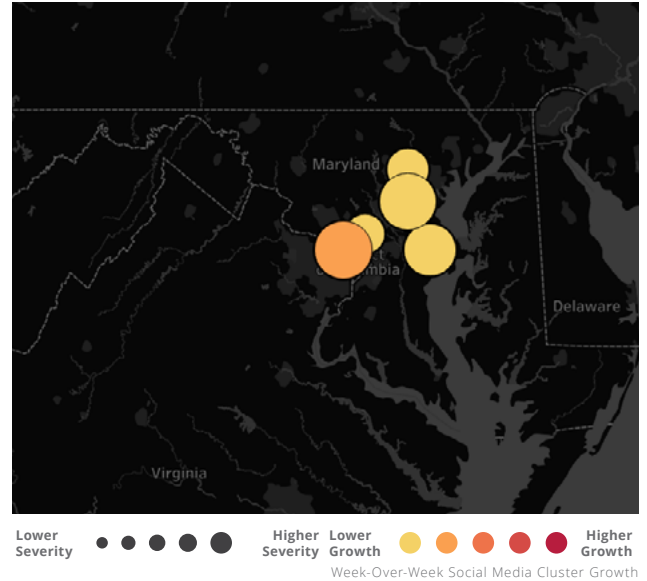
² Data sourced from Johns Hopkins CSSE, World Health Organization, CDC for research purposes

05

Maryland Case Study

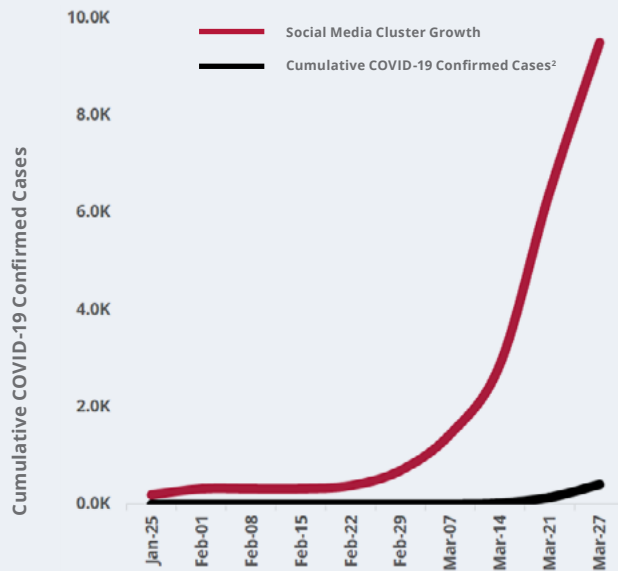


COVID-19 Social Media Clusters¹ Detected

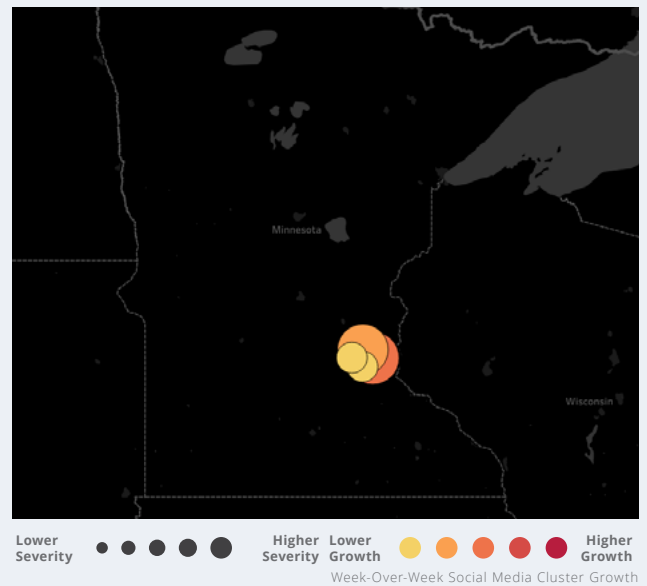


06

Minnesota Case Study



COVID-19 Social Media Clusters¹ Detected



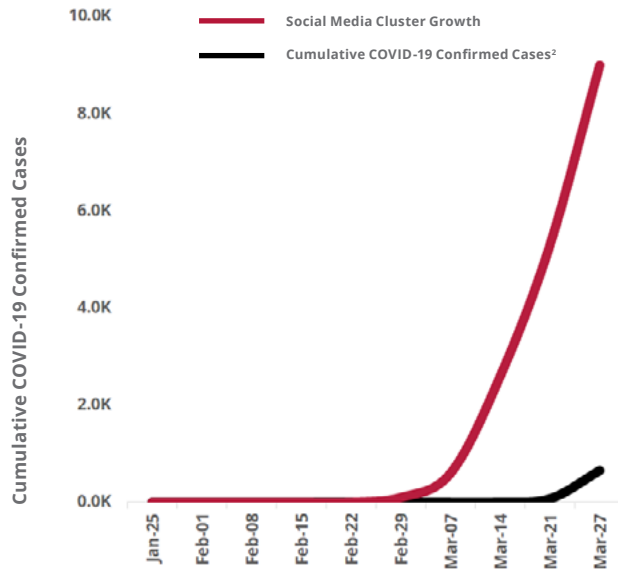
Note: Social Media Cluster Growth in above graph is depicted on a secondary scale

¹ These alert clusters represent clusters of organic, on-the-ground public social media posts ranging from people indicating they tested positive for CV, people indicating they are experiencing symptoms of CV, people indicating they have been exposed to CV but not tested, and first hand accounts of confirmed CV cases from relatives, friends, and colleagues as well as related supply shortages and closures.

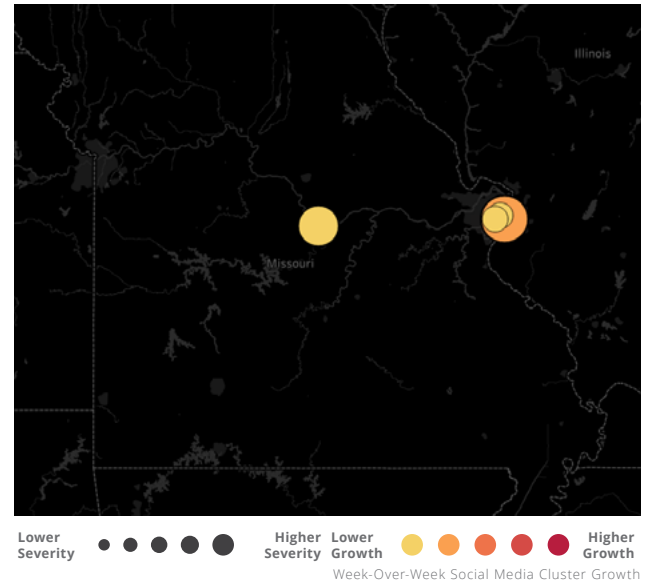
² Data sourced from Johns Hopkins CSSE, World Health Organization, CDC for research purposes

07

Missouri Case Study

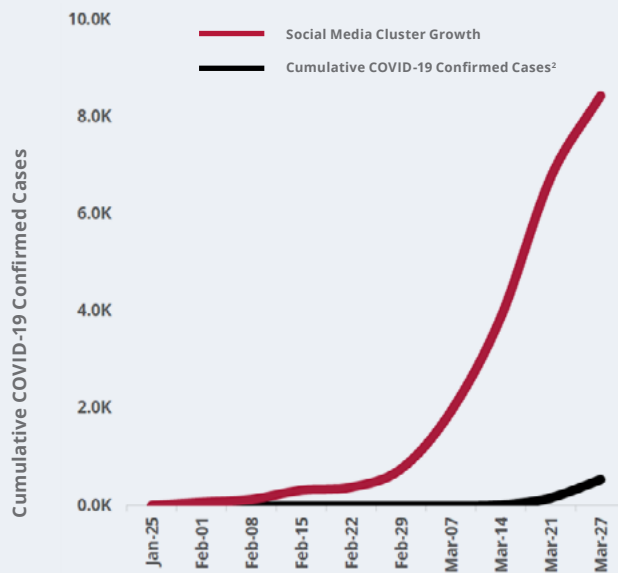


COVID-19 Social Media Clusters¹ Detected

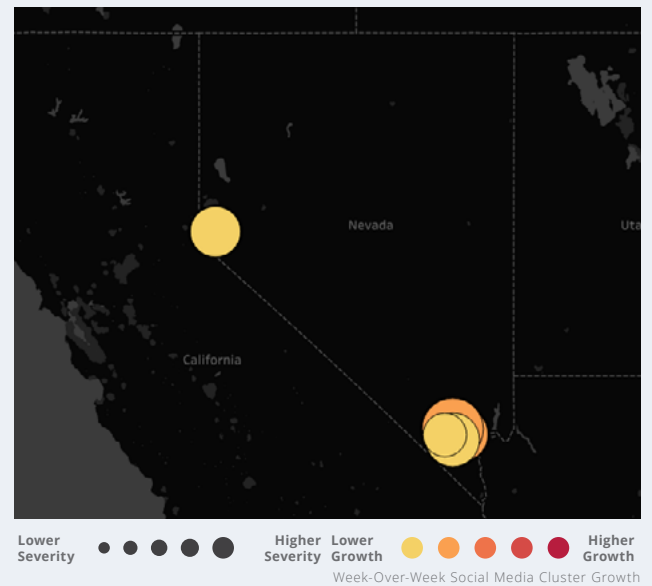


08

Nevada Case Study



COVID-19 Social Media Clusters¹ Detected

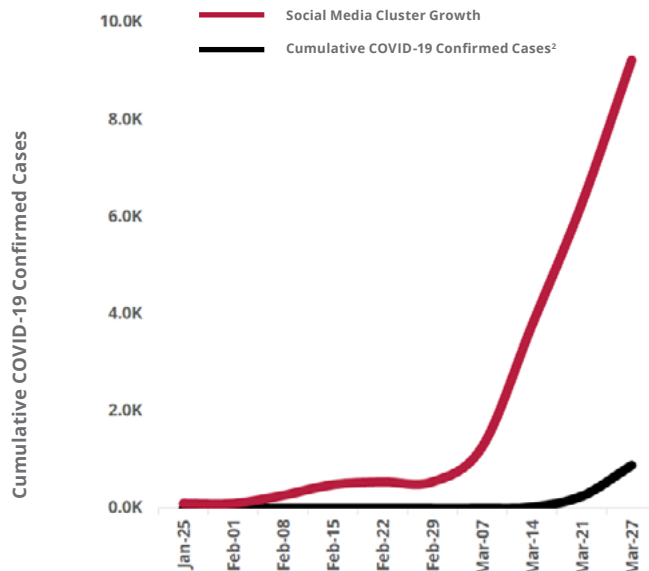


Note: Social Media Cluster Growth in above graph is depicted on a secondary scale

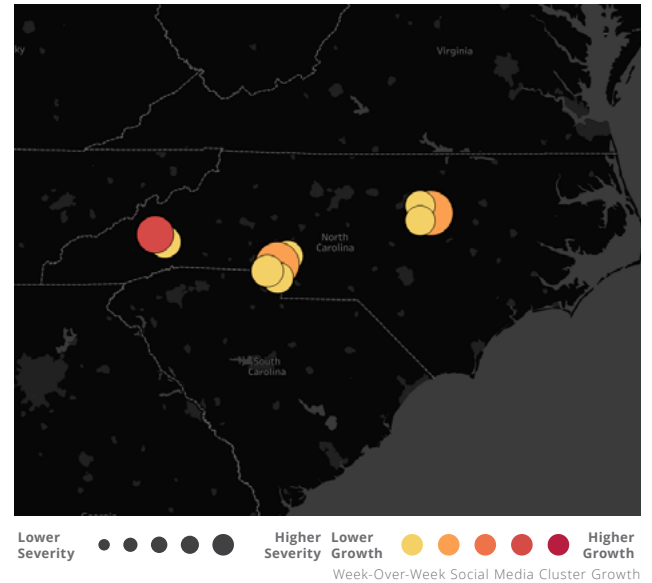
¹ These alert clusters represent clusters of organic, on-the-ground public social media posts ranging from people indicating they tested positive for CV, people indicating they are experiencing symptoms of CV, people indicating they have been exposed to CV but not tested, and first hand accounts of confirmed CV cases from relatives, friends, and colleagues as well as related supply shortages and closures.

² Data sourced from Johns Hopkins CSSE, World Health Organization, CDC for research purposes

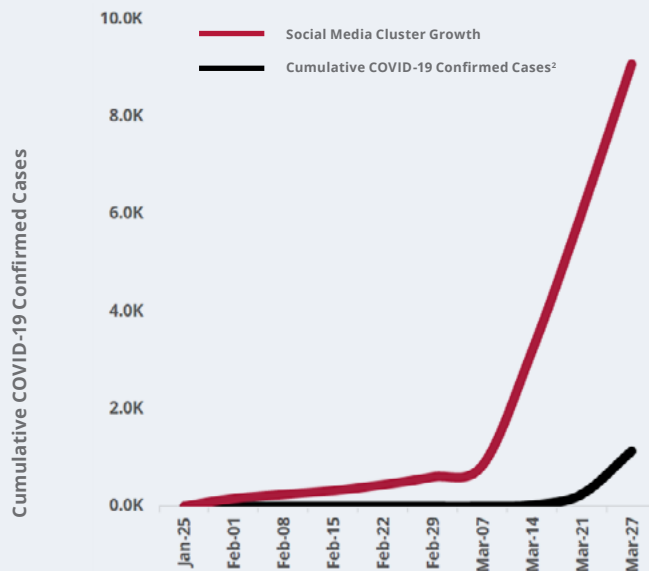
09 North Carolina Case Study



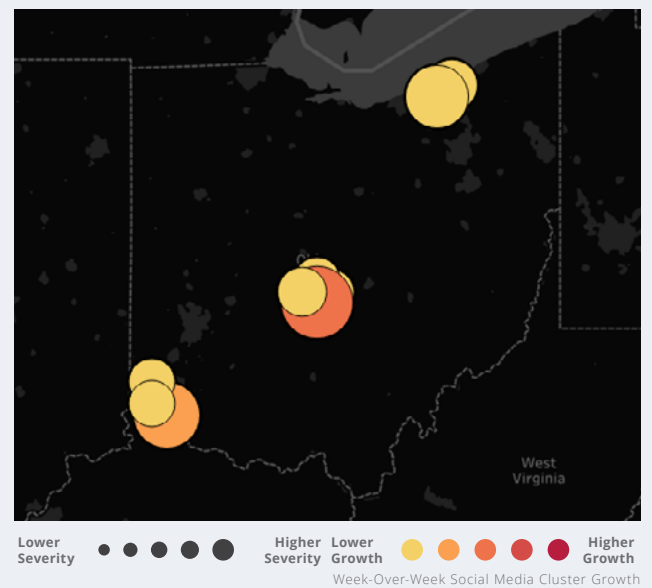
COVID-19 Social Media Clusters¹ Detected



10 Ohio Case Study



COVID-19 Social Media Clusters¹ Detected

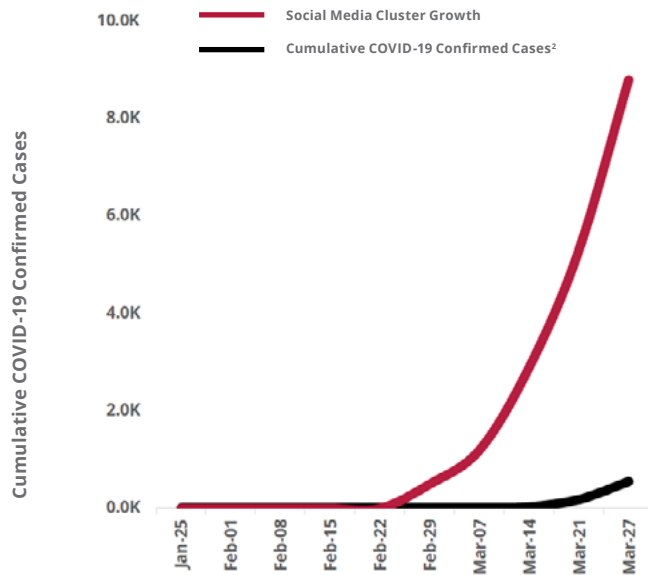


Note: Social Media Cluster Growth in above graph is depicted on a secondary scale

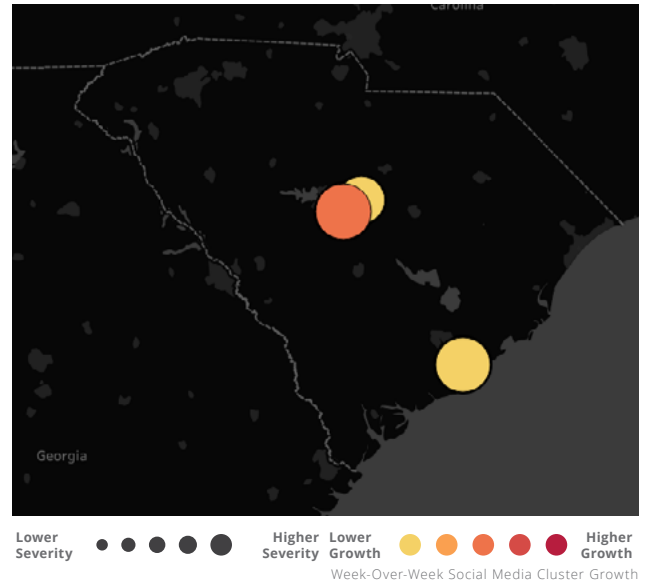
¹ These alert clusters represent clusters of organic, on-the-ground public social media posts ranging from people indicating they tested positive for CV, people indicating they are experiencing symptoms of CV, people indicating they have been exposed to CV but not tested, and first hand accounts of confirmed CV cases from relatives, friends, and colleagues as well as related supply shortages and closures.

² Data sourced from Johns Hopkins CSSE, World Health Organization, CDC for research purposes

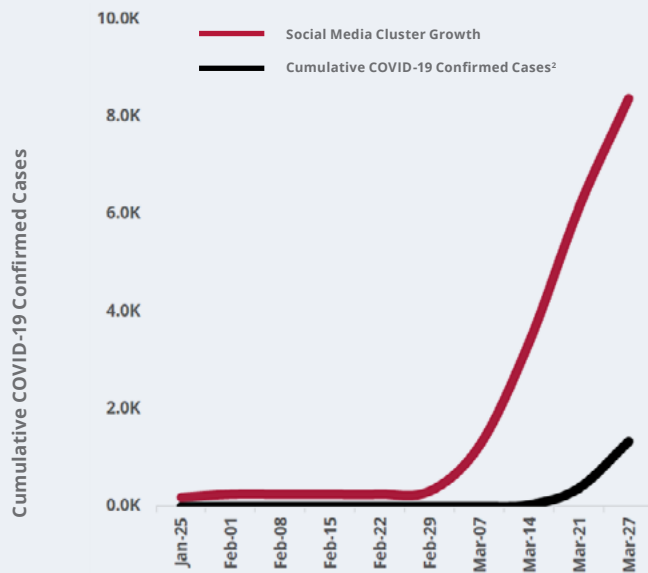
11 South Carolina Case Study



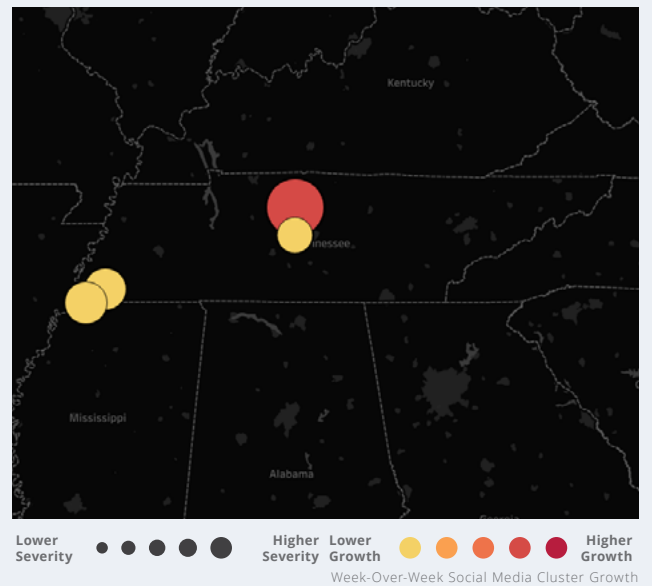
COVID-19 Social Media Clusters¹ Detected



12 Tennessee Case Study



COVID-19 Social Media Clusters¹ Detected

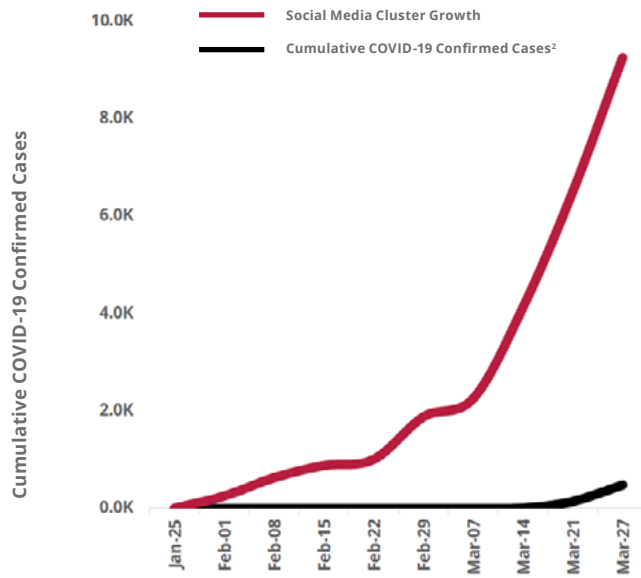


Note: Social Media Cluster Growth in above graph is depicted on a secondary scale

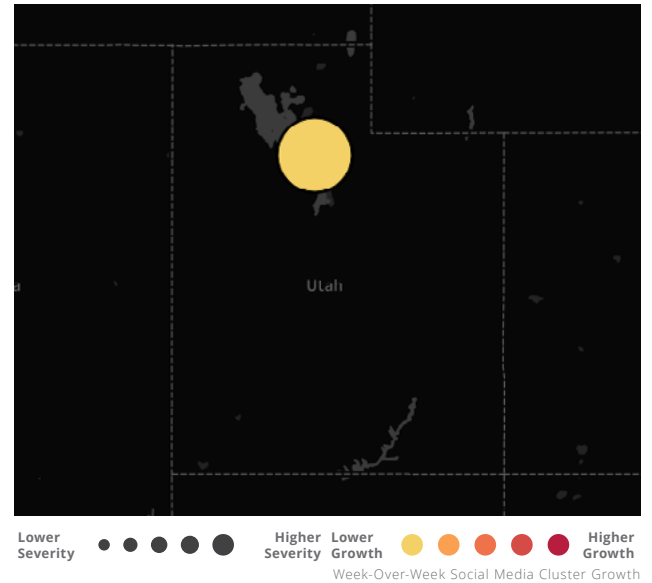
¹ These alert clusters represent clusters of organic, on-the-ground public social media posts ranging from people indicating they tested positive for CV, people indicating they are experiencing symptoms of CV, people indicating they have been exposed to CV but not tested, and first hand accounts of confirmed CV cases from relatives, friends, and colleagues as well as related supply shortages and closures.

² Data sourced from Johns Hopkins CSSE, World Health Organization, CDC for research purposes

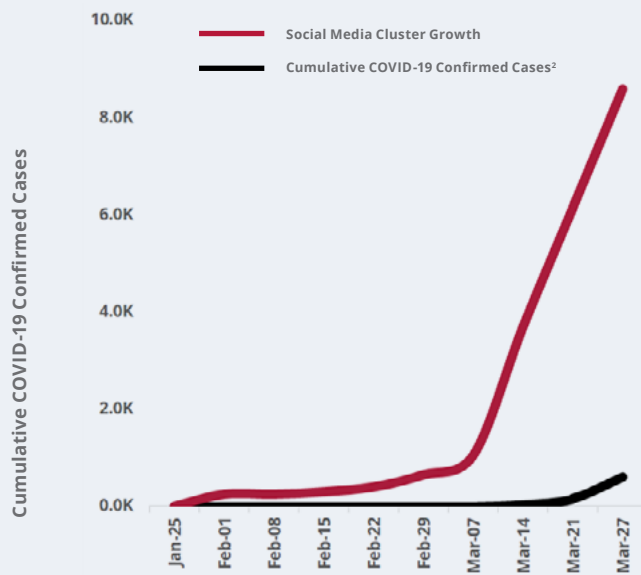
13 Utah Case Study



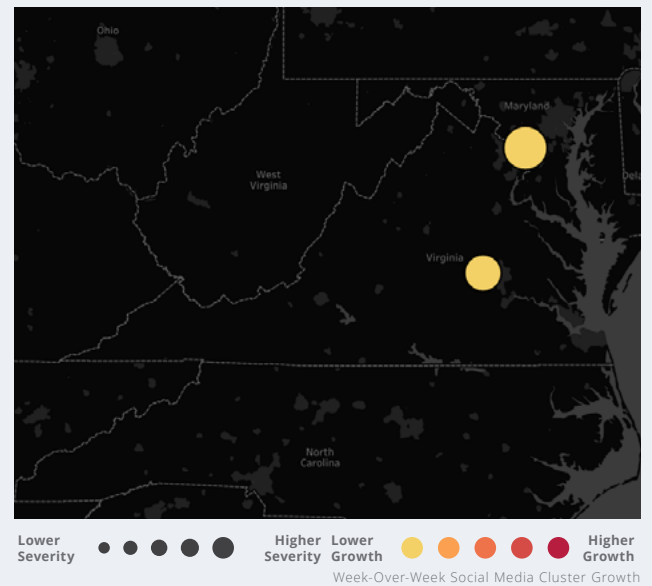
COVID-19 Social Media Clusters¹ Detected



14 Virginia Case Study



COVID-19 Social Media Clusters¹ Detected



Note: Social Media Cluster Growth in above graph is depicted on a secondary scale

¹ These alert clusters represent clusters of organic, on-the-ground public social media posts ranging from people indicating they tested positive for CV, people indicating they are experiencing symptoms of CV, people indicating they have been exposed to CV but not tested, and first hand accounts of confirmed CV cases from relatives, friends, and colleagues as well as related supply shortages and closures.

² Data sourced from Johns Hopkins CSSE, World Health Organization, CDC for research purposes



dataminr.com