

We're measuring online conversation to track social and mental health issues during the coronavirus pandemic

April 20 2020, by Amit Sheth

Drug addiction is one of the social ills people are concerned about in response to the coronavirus pandemic, according to an analysis of news stories and social media posts. Credit: [K-State Research and Extension/Flickr](#), [CC BY-SA](#)

Social media posts and news reports are rich sources of data about people's attitudes and behaviors. Using artificial intelligence techniques,

it's possible to sift through billions of words to discern trends in a population's well-being, or social quality. Performing this analysis during the COVID-19 pandemic is revealing the damage the pandemic is doing to the social and psychological well-being of the U.S.

At the [AI Institute of the University of South Carolina](#), [my colleagues](#) [and I](#) have processed more than 700 million social media posts since the beginning of March and more than 700,000 news articles about the COVID-19 pandemic. We are monitoring these information sources to capture the evolving human experience in the U.S. during the pandemic. We have found troubling indications of a growing mental health crisis and an increase in social ills such as substance abuse and gender-based violence.

What we found

Our analysis of news showed that social quality—measured in terms of depression, anxiety, substance use and addiction—declined in all parts of the country. But some areas showed drastic changes. For example, Oregon moved from better than average to among the worst few states in the nation. The emergence of prominent phrases like "major depression," "feel restlessness," "dependent on meth" and "sedative abuse" showed a substantial rise in the frequency of discussion about depression, substance abuse and severe medical conditions. These findings are supported by a manual review of [news stories](#).

An analysis of social media also showed declining social quality, especially notable from the first week of March to the second week. The analysis also identified hotspots of social quality declines in California, Michigan, New York, Virginia, Georgia and Florida. The states differ in how their social quality is declining. For example, the social media chatter in Michigan showed persistent, worsening signs of depression. In Georgia, substance use and addiction contributed more to the

deterioration of social quality as measured by social media posts.

How we do our work

Analyzing people's posts on social media can be messy. For example, when using the keyword "spice" to look for posts about [cannabis use](#), we have to make sure we're not accidentally including posts about "pumpkin spice latte." Our automated text analysis uses a knowledge graph, a database that keeps track of the meanings of words, to understand different meanings associated with the different uses of "spice."

Our team has defined a social quality index using several sources. To understand mental health-related conversations, we created a knowledge graph based on the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders. For concepts related to addiction, we used [knowledge about drug abuse](#) developed in our previous research on the topic. And to understand broader concepts, we used DBpedia, a knowledge graph derived from the world's largest encyclopedia, Wikipedia.

Monitoring the vast flow of words in news and social media can provide insights much faster than traditional survey measures. We examine this data for warnings of a possible epidemic of clinical depression, growing panic and anxiety concerns, and worsening [substance use disorders](#). Advanced warnings help policymakers and public health officials prepare to meet a surge. This is all the more important given that the United States was [already failing to meet the demand before this crisis](#).

What we don't know

Decades of psychological research shows that it's difficult to correlate physical changes in the environment like noise levels or brightness with

how humans respond to them. The effects of the COVID-19 pandemic provide the data to quantify the relationship between environmental threats like a highly contagious virus and human responses. Our analysis provides a foundation for developing social indicators and alarms that will help policymakers more quickly detect and more effectively prepare for emerging threats.

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