

# Letters

## RESEARCH LETTER

### Internet Searches for Acute Anxiety During the Early Stages of the COVID-19 Pandemic

There is widespread concern that the coronavirus disease 2019 (COVID-19) pandemic may harm population mental health, chiefly owing to anxiety about the disease and its societal fallout.<sup>1</sup> But traditional population mental health surveillance (eg, telephone surveys, medical records) is time consuming, expensive, and may miss persons who do not participate or seek care. To evaluate the association of COVID-19 with anxiety on a population basis, we examined internet searches<sup>2</sup> indicative of acute anxiety during the early stages of the COVID-19 pandemic.

**Methods** | The analysis relied on nonidentifiable, aggregate, public data and was exempted by the University of California San Diego Human Research Protections Program. Acute anxiety, including colloquially called anxiety attacks or panic attacks, was monitored because of its higher prevalence relative to other mental health problems. It can lead to other mental health problems (including depression), it is triggered by outside stressors, and it is socially contagious.<sup>3</sup> Using Google Trends (<https://trends.google.com/trends>) we monitored the daily fraction of all internet searches (thereby adjusting the results for any change in total queries) that included the terms *anxiety* or *panic* in combination with *attack* (including *panic attack*, *signs of anxiety attack*, *anxiety attack symptoms*) that originated from the US from January 1, 2004, through May 4, 2020. Raw search counts were inferred using Comscore estimates (*comscore.com*).

We compared search volumes after President Trump declared a national COVID-19 emergency on March 13, 2020, with expected search volumes if COVID-19 had not occurred, thereby taking into account the historical trend and periodicity in the data. Expected volumes were computed using an autoregressive integrated moving average model,<sup>4</sup> based on historical trends from January 1, 2004 to March 12, 2020, to predict coun-

terfactual trends for March 13, 2020 to May 9, 2020. The expected volumes with prediction intervals (PIs) and ratio of observed and expected volumes with bootstrap CIs were computed using R statistical software (version 3.5.3, R Foundation). The results were similar if we varied our interruption date plus or minus 1 week.

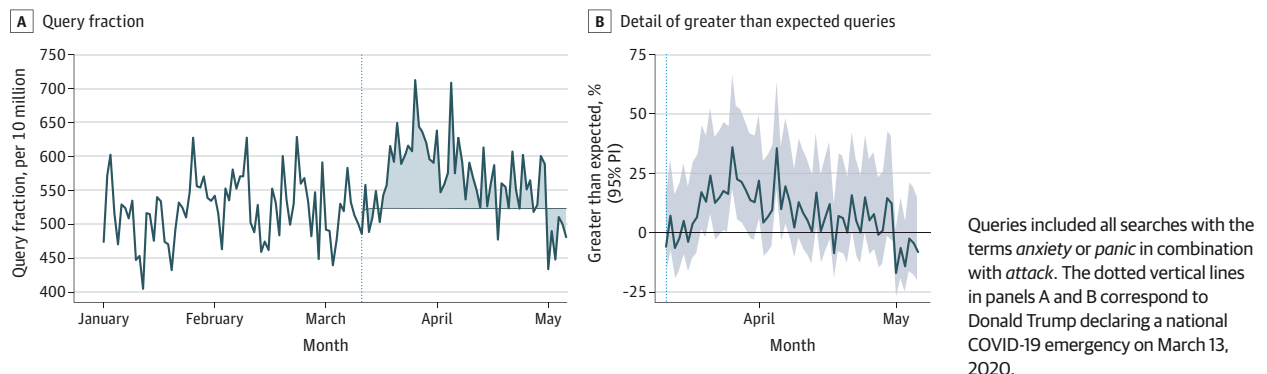
**Results** | All acute anxiety queries were cumulatively 11% (95% CI, 7%-14%) higher than expected (**Figure**) for the 58-day period that started when President Trump first declared a national emergency (March 13, 2020) and ended with the last available date of data (May 9, 2020). This spike was a new all-time high for acute anxiety searches. In absolute terms this translates to approximately 375 000 more searches than expected for a total of 3.4 million searches.

The largest spike in acute anxiety queries occurred on March 28, 2020, with 52% (95% PI, 27%-81%) more queries than expected. Moreover, most excess queries occurred between March 16, 2020, and April 14, 2020, when queries were cumulatively 17% (95% CI, 13%-22%) higher than expected. During this time national social distancing guidelines were first imposed (March 16, 2020) and extended (March 29, 2020), the US passed China with the most reported cases (March 26, 2020), the Centers for Disease Control and Prevention recommended using facemasks (April 3, 2020), and the US passed Italy for most deaths (April 11, 2020).<sup>5</sup> Queries first returned to expected levels on April 15, 2020, with all queries falling within expected prediction intervals thereafter.

**Discussion** | During the COVID-19 pandemic internet searches indicative of acute anxiety spiked early during the pandemic, but have since returned to typical levels, perhaps because Americans have become more resilient to the societal fallout from COVID-19 or because they had already received whatever benefit they could from searching the internet.

Even though acute anxiety has received substantial rhetorical attention during the COVID-19 pandemic, to our knowl-

Figure. Internet Searches for Acute Anxiety



edge it has not been subject to scientific inquiry until now. Although this study cannot confirm that any search was linked to a specific acute anxiety event or panic attack, it provides evidence of the collateral psychological effects stemming from COVID-19, and motivates several data-driven recommendations.

First, surveillance should continue as changes during the pandemic may spark new increases in acute anxiety that necessitate a response. Second, in light of the pandemic, resource providers should better address acute anxiety. For instance, Illinois launched “Call4Calm,” a hotline to help people cope with acute COVID-19 anxiety, and such programs could be expanded nationally. Third, more must be done to link those needing help with help. A “panic attack” Google query does not return any links to helplines, even though Google has pioneered the “OneBox” approach to mental health queries, highlighting life-saving results at the top of a user’s search results (including suicide and addiction hotlines) rather than hoping searchers find actionable information by chance alone. The Google OneBox should be expanded to promote resources for acute anxiety, like SAMHSA’s Disaster Distress Helpline, to meet potential increased demand during COVID-19 now and in the future.

Time-sensitive decision-making during a pandemic underscores the importance of fostering an agile empirical approach that can continually monitor health threats,<sup>6</sup> including the ability to study an outcome without a priori anticipatory data collection. Mining internet searches may improve strategies to discover and subsequently address the collateral mental health consequences of COVID-19.

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**Concept and design:** Ayers, Leas, Poliak, Althouse, Dredze, Nobles.

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