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## Journal of Clinical Anesthesia

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## Correspondence



## The rise and fall of the COVID-19 aerosol box through the lens of Twitter

The global COVID-19 pandemic has deeply affected the practice of anesthesiology and has catalyzed innovation concerning workplace safety. As experts in advanced airway management, anesthesiologists have been thrust into the “line of fire” of this highly contagious respiratory disease, and appropriate personal protective equipment (PPE) has been essential [1]. Early in the pandemic, while understanding of SARS-CoV-2 transmissibility was still limited, untested ideas intended to provide additional protection for anesthesiologists were quickly disseminated via social media. One example was the “aerosol box” designed to contain airborne virus spread during airway procedures. We aimed to characterize the rapid rise in popularity of the aerosol box and eventual decline through the lens of Twitter (San Francisco, CA, USA) and research publications that lagged behind social media.

With IRB exemption (Stanford, CA USA), we accessed the Twitter public application programming interface and prospectively collected tweets and retweets from March through October 2020. We included tweets containing “intubation box(es),” “aerosol box(es),” or “intubation barrier(s)” and excluded all tweets missing at least of these search terms. Tweets were analyzed for frequency, type of tweet (original tweet, quoted tweet, a retweet of the original tweet, or retweet of quoted tweet), the number of unique users, and geographic location of users using R package “rtweet” version 0.6.9 [2].

Fig. 1 shows the frequency distribution of the 25,761 original tweets, retweets of original tweets, and quotes of original tweets generated during this 7-month period. After Dr. Hsien Yung Lai made the aerosol box design [3] freely available as a Google Site (Mountain View, CA, USA) in late March, Twitter users generated hundreds to thousands of tweets per day mostly coming from the United States, Philippines, Colombia, India, and Malaysia (Fig. 1). Tweets peaked after the April

[4], and the U.S. Food and Drug Administration (FDA) issued emergency use authorization (EUA) for COVID-19 protective barrier enclosures on May 1, 2020 (<https://www.fda.gov/media/137584/download>).

However, enthusiasm quickly faded with the publication of more rigorous studies. Two key publications raised serious concerns about the box due to airway management challenges [5] and increased exposure to airborne particles [6]. Citing these two studies [5,6], the FDA revoked the EUA for protective barrier enclosures on August 20, 2020 (<https://www.fda.gov/media/141415/download>). After the online publication of the Begley et al. study on May 12 [5], there were only two noteworthy Twitter spikes related to the aerosol box on June 14 and 29 (Fig. 1), and both were unrelated to new evidence. These tweets referenced aerosol box donations and were posted by influencers @Duke-Condret and @GoenkaPK which were highly retweeted due to these users’ large number of followers. To date, there has been very little Twitter activity related to the aerosol box since the end of July.

Using Twitter data, we have shown the rapid rise and fall in popularity for the aerosol box which was designed to provide additional barrier protection for anesthesiologists who provide advanced airway management for COVID-19 patients. There is still a substantial time lag between the initial social media dissemination of a popular concept and the publication of peer-reviewed research despite the expedited processing of COVID-19 articles. A limitation of our work is the inability to assess the extent to which the aerosol box has actually been used clinically by both users and non-users of social media. However, we present this example to demonstrate the power of social media as a tool to share new ideas and inventions efficiently in an evolving crisis but also to advise clinicians and researchers to maintain equipoise until rigorous studies are published.

publication of a letter and video in the New England Journal of Medicine

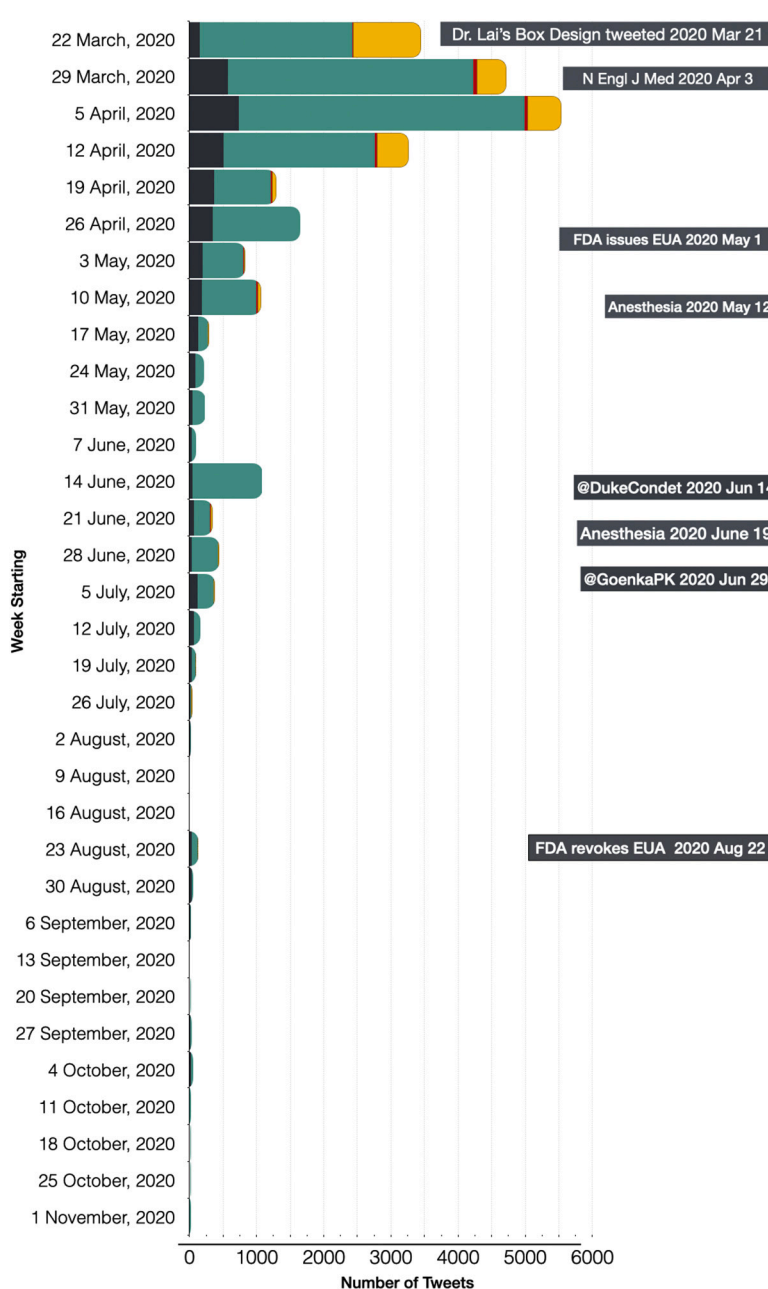
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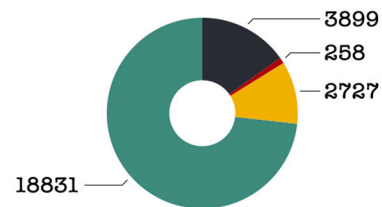
### TIMELINE OF TWEETS REGARDING THE AEROSOL BOX AND AEROSOL BARRIERS



#### LEGEND (TYPE OF TWEETS)

- Original Tweet
- Retweet of Original
- Quote of original tweet
- Retweet of Quote

#### NUMBER OF TWEETS BY TYPE



#### NUMBER OF UNIQUE USERS TWEETING



#### TOP 5 COUNTRIES TWEETING



**Fig. 1.** Timeline of tweets regarding the aerosol box and aerosol barriers. Each of the three article references notes the date of online publication. Abbreviations: FDA, Food and Drug Administration; EUA, emergency use authorization.

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