Research finds negativity about vaccines surged on Twitter after COVID-19 shots became available

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There was a marked increase in negativity about vaccines on Twitter after COVID-19 vaccines became available, according to a presentation at the ESCMID Global Congress (formerly ECCMID) in Barcelona, Spain (27–30 April).

The analysis also found that spikes in the number of negative tweets coincided with announcements from governments and health care authorities about vaccination.

It's time to take a new approach to addressing negative messaging about vaccines, including avoiding the use of the term "anti-vaxxers," say the researchers.

"Vaccines are one of humanity's greatest achievements," explains lead researcher Dr. Guillermo Rodriguez-Nava, of Stanford University School of Medicine, Stanford, U.S..

"They have the potential to eradicate dangerous diseases such as smallpox, prevent deaths from diseases with 100% mortality rates, like rabies, and prevent cancers such as those caused by HPV.

"Moreover, vaccines can prevent complications from diseases for which we have limited treatment options, such as influenza and COVID-19, but there has been growing opposition to their use in recent years.

"The damage caused by negative voices is already apparent, with clusters of measles re-emerging in countries where it was previously considered eradicated.

"This situation harms children who cannot make decisions for themselves regarding vaccines, as well as immunocompromised patients
who are unable to get vaccinated."

Dr. Rodriguez-Nava and colleagues analyzed the impact of the introduction of COVID-19 vaccines on the sentiment of vaccine-related posts on Twitter.

Open-source software (the Snscrepe library in Python) was used to download tweets with the hashtag "vaccine" from 1 January 2018 to 31 December 2022.

Cutting-edge AI methods were then used to perform sentiment analysis and classify as the tweets having either positive or negative sentiment. Finally, modeling techniques were used to create a "counterfactual scenario." This showed what the pattern of tweets would have looked like if COVID vaccines hadn't been introduced in December 2020.

A total of 567,915 tweets were extracted and analyzed. Of these, 458,045 classified as negative and 109,870 as positive by the machine learning algorithm. Tweets that were negative in sentiment were predominant both before and after vaccines became available.

Negative tweets included, "The EU Commission should immediately terminate contracts for new doses of fake #vaccines against #COVID19 and demand the return of the 2.5 billion euros paid so far. Everyone who lied that #vaccines prevent the spread of the virus must be held accountable."

Positive tweets included one that marked a baby receiving some of its childhood vaccinations and read: "Two month shots! #vaccines are always a reason to celebrate in our house. #VaccinesWork."

After COVID vaccines were introduced, there was a marked in increase the number of tweets about vaccines, with 10,201 more vaccine-related
tweets per month, on average, than would be expected if vaccination hadn't started.

There was also a marked increase in negativity. There were 310,508 tweets (approx. 12,420 a month on average) with negative sentiment after December 11, 2020. This is 27% more than the 244,635 (9,785 a month) that would be expected if COVID vaccination hadn't started.

The proportion of positive tweets fell from 20.3% to 18.8% after the introduction of COVID vaccines and the percentage of negative tweets rose from 79.6% to 81.1%.

Spikes in negative activity coincided with announcements about vaccination. For example, the highest number of negative tweets was in April 2021, the month the White House announced that all people aged 16 and older would be eligible for the COVID-19 vaccine.

The lowest number of negative tweets after the introduction of COVID-19 vaccines was in April 2022, the month Elon Musk acquired Twitter. While it isn't known why this was, it may have been part of a seasonal pattern (the number of negative tweets tended to be highest in the winter). It's also possible that Twitter users were focusing on the changes to the platform that came with the new ownership, says Dr. Rodriguez-Nava.

The researchers conclude, "Negative sentiments toward vaccines were already prominent on social media prior to the arrival of COVID-19 vaccines. The introduction of these vaccines significantly increased the negative sentiments on X, formerly Twitter, regarding vaccines."

Dr. Rodriguez-Nava says, "Social media has the power to exponentially amplify health messages, both beneficial and harmful, and is an arena in which political figures, actors, singers, personalities and other"
'influencers' outnumber health care voices.

"Unfortunately, in some countries, negative sentiments toward vaccines are not only health-related but also religious and political.

"This is a complex issue, with no easy solution, but we do need to change our approach because it is clearly not working.

"This begins with avoiding derogatory terms such as 'anti-vaxxers,' and perhaps even 'misinformation,' and approaching these individuals in a more respectful and understanding manner.

"Additionally, health care leaders should dedicate more effort to collaborating with social media influencers, religious leaders and lawmakers, who may be more trusted by their communities than health care professionals and more effective in amplifying a positive message.

"Social media companies also have a role to play. However, this is also a complex issue because each company may have different values and attitudes to free speech and countries may have different laws for free speech."

Provided by European Society of Clinical Microbiology and Infectious Diseases

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