

Social media's impact on vaccine hesitancy

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Assistant professor Young Anna Argyris, in the College of Communications Arts and Sciences. Credit: Michigan State University

Though COVID-19 vaccines are widely available, many people in the United States have not received the vaccine and don't plan on getting one. Assistant professor Young Anna Argyris, in the College of Communications Arts and Sciences, sheds light on the data and social media influences behind vaccine hesitancy.

How do visuals on social media influence people's likelihood to get vaccinated?

Visuals on social media like memes, videos, photos, posters and emojis are processed faster, accepted without being questioned, and remembered for a longer period than text posts. Especially since the visual often includes a personalized dramatization of [vaccine](#) injuries—like an individual having a life-threatening seizure after receiving a vaccine.

Since social media has rapidly grown as a source of news, more and more people are obtaining [health information](#) from social media. As a result, visual messaging on social media has significant associations with people's intentions to get

vaccinated—not only against COVID-19, but also for other immunizations. Specifically, our latest study has shown that individuals' engagement with anti-vaccine messages on social media has a negative impact on their intentions to get vaccinated, while their engagement with pro-vaccine messages has no significant association.

What propaganda techniques are used by anti-vaccination groups to influence the conversation around vaccines? Is this leading to more vaccine hesitancy?

Anti-vaccination groups use all the four propaganda techniques known to be effective in political campaigns. They define the pressing issue as vaccine safety/injuries and inefficacy and blame pharmaceutical companies for "cutting corners" to rapidly produce vaccines. They also make moral judgements by suggesting a coalition between corrupted politicians and profit-driven health care industries and recommend rejecting vaccines as a remedy to this problem.

How can we frame the message around vaccines on social media to encourage higher participation in vaccination efforts?

Prior studies on health communication have shown the importance of emphasizing the benefits of taking a health behavior rather than portraying the harms of refusing to take the health behavior. Also, focusing on the immediate and personalized benefits have been found more effective than distant, societal benefits. The revised mask mandate by Centers for Disease Control and Prevention is in alignment with these findings: Make clear the tangible, immediate and personal benefits of getting COVID-19 vaccines such as, "You can finally take off your masks as long as you get vaccinated!"

Conversely, focusing on societal, long-term benefits, such as the creation of herd immunity, has been known to be ineffective for encouraging individuals to take health behaviors. A well-known

example of this communication strategy is to encourage safe sex practices during the HIV epidemic. Instead of focusing on the severe consequences of not using those health practices, communication specialists emphasized the benefits of practicing safe sex—you can enjoy your life freely if you practice safe sex.

In short, the rhetoric for encouraging immunizations on social media should emphasize immediate and personalized benefits of taking the vaccines, rather than long-term protective or societal benefits. The effectiveness will also magnify if these benefits can be visually framed in photos, videos, memes, and/or posters, for the augmented persuasiveness of visual stimuli than textual narratives.

How can social media users tell the difference between high quality vaccination information on social media and propaganda or misinformation?

Discerning accurate information from misinformation is a challenge that individuals may not be able to completely resolve. Social media puts us in a bubble called, "Eco chambers" where we are surrounded by like-minded individuals who reinforce our own existing views rather than being challenged by different views. Studies have shown that debiasing individuals especially from anti-vaccine beliefs is an extremely challenging task because health beliefs are deeply ingrained in our cultural backgrounds, political/religious beliefs and lifestyle choices. Thus, it is recommended to prevent populations that are especially vulnerable and susceptible to health misinformation from being exposed to it in the first place. It is essential to suppress the propagation of vaccine misinformation via social media. These solutions can be embedded in tools like fact-checkers installed in our [web browsers](#) that warn readers if the information to be presented is likely to be false.

One of your projects focused on mothers in particular. What are the challenges mothers face in making decisions about whether to get their children vaccinated for COVID-19?

Mothers make over 90% of health decisions for children on their own or jointly with their children

and/or partners. In any case, even though the gender roles are changing in this society, mothers still remain the key decision-makers for health-related issues for children. We need to recognize the intensity of stress that mothers feel when they must make decisions that directly affect their children's well-being. In such emotion-laden circumstances, individuals' tendency to choose a status quo option—inaction, or refusing to take any action at all—increases disproportionately. So, they end up with the non-decision, "let's wait and see," which is manifested in "[vaccine hesitancy](#)." The intense stress that mothers experience when making vaccination decisions is a crucial factor that increases their tendency to delay or deny immunizations for their children.

You designed a machine learning algorithm to detect anti-vaccination messages online. Can you tell us a little about how that works? How else could this technology be used?

Our deep-learning anti-vaccine detector recognizes multimodal content in social [media](#) posts, including text (comments and responses), hashtags and visual elements with 97% of accuracy. To the best of our knowledge, this accuracy has thus far been the highest reported in the literature on anti-vaccine detection. And I dare to say the 97% of accuracy is higher than human's detection accuracy. In my experience, humans frequently make errors when they must classify thousands of [social media](#) posts due to fatigue they experience after many hours of repeating the same classification task. Our algorithm doesn't get tired.

In addition, this algorithm can be easily plugged into a web browser to function as a fact-checker that sends a warning message to the user when they are about to be exposed to vaccine misinformation.

What reasons do most people give for not getting vaccinated? Whether based in science or fact, are they sharing these reasons on social media?

Anti-vaccine messages have diverse themes, all of which converge to vaccine safety/injuries and the conspiracy theory on the alliance between

corrupted politicians/government and the profit-driven pharmaceutical industry. Many of these posts in fact provide statistics, test results and even seemingly tangible evidence to back their claims. These messages are so elaborated and appear to be trustworthy that even most educated individuals can easily fall prey.

Provided by Michigan State University

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