Vaccine science and side effects: How news messages affect views on vaccination

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News coverage of expert scientific evidence on vaccine safety is effective at increasing public acceptance of vaccines, but the positive effect is diminished when the expert message is juxtaposed with a personal narrative about real side effects, new research has found.

The study, by researchers affiliated with the Annenberg Public Policy

Center (APPC) of the University of Pennsylvania and the University of Illinois, tested the effects of messages about vaccination in televised news reports. These included video clips of Dr. Anthony Fauci, director of the U.S. National Institute of Allergy and Infectious Diseases, talking about evidence supporting the value and safety of the MMR (measles, mumps and rubella) vaccine, and a mother who's refusing to vaccinate her youngest child because her middle child, who is shown with a rash, had what she characterized as severe reactions after receiving the MMR vaccine.

The research, published in *PLOS ONE,* is based on an experiment with a nationally representative sample of 2,345 participants during the 2019 U.S. measles outbreak.

The study, "The Effects of Scientific Messages and Narratives About Vaccination," found that:

- Fauci's "science-supporting" message had significant positive effects on views about vaccination when compared with a control message. Participants exposed to the expert message had lower perceptions of risk from vaccination; stronger pro-vaccine policy views; and stronger intentions to send a pro-vaccine letter to a state representative and to encourage other people to vaccinate their children.
- The "hesitancy-inducing" narrative by the mother had no significant effect by itself on these outcomes.
- But when the two messages were juxtaposed, with video of the mother preceding Fauci, the mother's hesitancy narrative diminished the effectiveness of the pro-vaccine message, according to some measures.

"In this paper," the authors write, "we treated parental reports of potentially real side effects as Hesitancy-Inducing Narratives because,

even when accurate, their portrayal in media can lead to overgeneralization and fuel vaccine hesitancy by leading the public to draw inaccurate inferences about the prevalence and severity of side effects. In short, individual cases of vaccine side effects, even if true, may elicit false inferences, and the media's reliance on dramatic and vivid cases may lead to overestimation of risks that are relatively rare."

The research

The experiment was conducted from February 28-March 18, 2019, during the largest U.S. measles outbreak in over a quarter-century. "We often wondered about stories of vaccine side effects—like the concerns we've heard recently with the COVID-19 vaccines," said lead author Ozan Kuru, who worked on the study as a postdoctoral fellow at APPC and is now an assistant professor in the Department of Communications and New Media at the National University of Singapore. "Do those stories have negative effects on support for vaccines, and how do we ensure that people have an accurate understanding of the science?"

Prior research has failed to simulate the actual news environment by assessing the effects of exposure both to experts' messages about the value of vaccination and to personal accounts of the reasons for vaccination hesitance that discuss actual but relatively rare side effects.

According to the Centers for Disease Control and Prevention (CDC), "soreness, redness or rash where the shot is given and rash all over the body can happen after MMR vaccine," while "more serious reactions happen rarely," including seizures, temporary pain and stiffness in the joints, pneumonia, and swelling of the brain and/or spinal cord covering. "As with any medicine, there is a very remote chance of a vaccine causing a severe allergic reaction, other serious injury or death."

The researchers said, "This dual aspect of vaccine side effects—their

rare existence and people's tendency to overgeneralize from individual stories—places their portrayal in the media in what we consider a gray zone between accurate and misleading information. We thus posit that media coverage of such stories without proper contextualization can be misleading and has the potential to influence public opinion."

Vaccine videos

In this experiment, the researchers used edited videos from televised news coverage with the network identification removed. The 2,345 participants were randomly assigned to view one of six short, edited video clips:

- (1) the mother's "hesitancy-inducing" narrative;
- (2) Fauci's expert, "science-supporting" statistics-heavy video;
- (3) a "science-supporting" video of parents whose children would be endangered if exposed to measles but could not get the vaccine for other health reasons or who had caught measles and experienced complications;
- a combination of the mother's narrative (1) and Fauci (2);
- a combination of the mother's narrative (1) and the other parents (3);
- a control video about the benefits of aspirin.

After watching the videos, the participants answered questions about vaccine risk, support for pro-vaccine policies, their intentions to encourage parents to vaccinate their children, and whether they would agree to send a pro-vaccine letter to a state representative.

On the findings

Contrary to the researchers' initial hypothesis, the mother's "hesitancy-

inducing" narrative did not by itself affect outcomes—which, the authors say, is "generally consistent with research suggesting that exposure to single messages rarely produced an impact." However, the fact that it lessened the positive effects of the Fauci video raises concerns and invites further study.

"It might be that when we hear the mother's narrative in isolation, we don't make a big deal of it," said co-author Dolores Albarracín, a professor of psychology and business administration at the University of Illinois at Urbana-Champaign and a distinguished research fellow at APPC. "But when people subsequently hear about the science, it prompts them to think about vaccines, they recall the mom, and this leaves them haunted by doubts."

Kathleen Hall Jamieson, a co-author and director of the Annenberg Policy Center, noted that Fauci is delivering an unconditional "it's safe" message about the MMR vaccine. "Nothing the mother says is inaccurate," Jamieson said. "We assume that exposure to her story and visualized evidence of her rash-ridden older child calls into question Dr. Fauci's categorical assertions about the safety of the vaccine."

The "science-supporting" video from the parents was found to be relatively ineffective compared with Fauci's message.

Implications for COVID-19 messaging

The researchers said the findings have important implications for public health messaging and newsroom decisions about coverage of COVID-19 vaccines.

"We are not recommending that the media stop reporting about vaccine safety and side effects," Albarracín said. "But our recommendation is that statistical information about vaccine trials should be communicated

to the public repeatedly and early, before vivid narratives of side effects take hold."

Jamieson added, "The scientific community needs to remind the public that the benefits of using approved vaccines outweigh the risks—and that the risks associated with contracting the disease are substantially higher than any associated with the vaccine."

More information: Ozan Kuru et al, The effects of scientific messages and narratives about vaccination, *PLOS ONE* (2021). DOI: 10.1371/journal.pone.0248328

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