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High Facebook posts provide insights into pro- and anti-vaccination beliefs

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One of the challenges to understanding the concerns behind vaccine hesitancy is that very seldom are people with worries about vaccines and vaccine advocates brought together in the same space, especially online. Both groups gravitate towards internet "echo chambers," only communicating with other likeminded individuals. In January 2016, however, Facebook co-founder Mark Zuckerberg posted a photo of himself holding his baby daughter with the caption "Doctor's visit - time for vaccines!" With his undeniable reach and the ability of anyone to comment, the post represented a unique opportunity to analyze the language used to express pro- vaccination and anti-vaccination viewpoints and understand how people on both sides of the debate perceive the risks of vaccination.

While the internet has revolutionized the dissemination of information, misinformation about vaccines has been linked to anti-vaccination viewpoints, contributing to reduced vaccination rates and outbreaks of previously controlled diseases. Many public health initiatives aimed at trying to reduce vaccine hesitancy have had poor results. In an attempt to better understand the discussion surrounding vaccines, researchers from the University of New South Wales (UNSW) and La Sierra University looked at the language people used in an open online forum on Facebook discussing vaccines. They found important clues that may help shape more effective pro-vaccination communications.

Researchers analyzed approximately 1,400 comments on the Zuckerberg post using the Linguistic Inquiry and Word Count (LIWC) text analysis

program. The software sorts words into psychologically meaningful categories and then outputs a percentage of words belonging to each category. They found that while the anti-vaccine viewpoint is often seen as highly anxious about the issue, it was the pro-vaccination comments that expressed greater anxiety - especially around family and broader social processes (e.g. herd immunity). In contrast, the anti-vaccination comments were more logically structured, and tended to emphasize topics related to health and biology, as well as talking about research and science.

"This concerns us because the scientific evidence is very clear in demonstrating the safety and benefits of vaccines," noted Kate Faasse, PhD, Lecturer, Health Psychology, UNSW, Sydney, Australia. "Because these skeptical comments appear on the surface to be quite logical and, because they focus on health, biology, and research, they may be particularly compelling for parents who are uncertain about what decision to make about childhood vaccination and are seeking more information."

Other studies have shown the persuasive power of anti-vaccination websites and according to this new study, the lower use of anxiety words from the anti-vaccination comments may reflect a lack of understanding about the potential risks of the diseases that vaccinations prevent. "The findings from this research suggest that providing better information about how vaccinations work and how they improve health, as well as increasing public understanding of science and the scientific process, may be particularly important when encouraging vaccination," added Leslie R. Martin, PhD, Department of Psychology, La Sierra University, Riverside, CA.

While vaccines are safe and effective for most of the population, there are people who cannot be vaccinated for legitimate health reasons, including very young children and the immunocompromised. These

populations become vulnerable when large numbers of people opt-out of being vaccinated, because it decreases herd immunity. In 2014, the U.S. experienced a record number of measles cases; in developed countries a large proportion of these infections occur among the intentionally unvaccinated.

"Outbreaks of vaccine-preventable infectious diseases related to vaccine refusal are on the increase," explained Dr. Faasse. "It's important to find ways to better understand what people's concerns are and why they make the decisions they do about vaccination - in particular, the decision not to vaccinate. Research using social media can give us a different perspective on the types of concerns that people have - and can help researchers and public health officials understand what sorts of information might be useful for addressing these concerns for people who are making decisions about vaccination."

These data, gathered from responses to one high profile Facebook post, suggest that pro- and anti-vaccination viewpoints see the risks of vaccination in very different ways, and often seem to communicate at cross-purposes. Pro-vaccination comments expressed a lot of anxiety about the risks to families, and to society as a whole, of choosing not to vaccinate. In contrast, anti-vaccination comments talked much more about vaccination decisions in terms of biology, health, science, and research. Dr. Faasse concluded that this information is particularly useful because "greater insight about the specific worries people have about vaccination and decisions not to vaccinate can help us provide accurate information to better address these concerns."

More information: Kate Faasse et al. A comparison of language use in pro- and anti-vaccination comments in response to a high profile Facebook post, *Vaccine* (2016). DOI: 10.1016/j.vaccine.2016.09.029

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