Twitter could bring better understanding of vaccine refusal patterns

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A team of researchers has developed a new way to understand vaccine refusal by drawing upon an unlikely resource: Twitter.

"People really do tweet about everything, and conversations about vaccines are no exception," said David Broniatowski, assistant professor in the School of Engineering and Applied Science at the George Washington University, who will co-lead the study on vaccine refusal patterns. "Parents and patients freely share their fears and concerns about vaccines. While it typically takes years to collect meaningful

information about why people refuse vaccines, using surveys and searching Twitter brings immediate results."

The focus on vaccination is particularly timely, with a severe flu season underway and recent well-publicized outbreaks of vaccine-preventable illnesses such as measles in 17 states and the District of Columbia, and mumps among National Hockey League players.

The researchers will combine Twitter analyses with traditional survey techniques to study why people refuse vaccines and how these reasons vary among communities.

"Survey data tend to draw from older, white, rural households, whereas younger, urban minorities are overrepresented on Twitter," said Karen Hilyard, assistant professor in the College of Public Health at the University of Georgia, who also will lead the study. "These two techniques complement each other perfectly."

Mark Dredze, assistant research professor at the Johns Hopkins University, will develop new computer algorithms to support the team's research. "We hope to gain insights into people's reasoning about vaccines by automatically processing millions of Twitter messages," Dr. Dredze said.

Since receiving the grant last month, Drs. Broniatowski, Hilyard, and Dredze have already analyzed millions of tweets to gather information on sentiment toward flu vaccinations. The team identified tweets, geo-located the messages and compared their findings to the Centers for Disease Control and Prevention's Behavior Risk Factor Surveillance System. Their results show that states with a higher number of residents who received the flu shot had a higher number of vaccine-positive messages on Twitter.

"This was really surprising and exciting," Dr. Hilyard said. "It shows that we can get this type of information from Twitter faster, cheaper and more easily. Frankly, it's a game changer when it comes to health surveys, especially as we dig deeper to examine more complex attitudes and beliefs among different demographic groups."

Using social media to reveal thinking about vaccines in real time will help health officials to better respond to the next outbreak, saving lives and keeping people healthy. It will also be a boon for science, helping researchers quickly home in on those tough questions that need more study.

"The dream would be to get ahead of the next outbreak," Dr. Broniatowski said. "How can we take what we learn here and better educate parents about the merits of vaccines and other public health decisions that seem risky? If we could do that, then hopefully we'd be able to prevent the next measles outbreak."

More information: "National and Local Influenza Surveillance through Twitter: An Analysis of the 2012-2013 Influenza Epidemic." DOI: 10.1371/journal.pone.0083672

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