

The Anti-vaccination Movement and its Implications on the Public's Understanding of Science



Lauren Yan¹ and Michael Koehler²
¹Palo Alto High School, ²Genentech, Inc.



INTRODUCTION

- Vaccines are proven and communicated to be safe, effective and, most importantly, necessary
- Nevertheless, many objections
- Many cultural and sociological aspects of the spread of this information
- When the public refuses to cooperate with or react accordingly to scientific research and warnings, progress that can greatly benefit many is delayed.

RESEARCH METHODOLOGIES

Data Collection Tools: Surveys, and published journals/articles

Data Analysis Technique:

Close read → analyze → code

1. Mark obstacles mentioned
2. Quotes sorted into categories of obstacles the public face in trusting science
3. Short summarizing statement of each obstacle

ANALYSIS

In general, the majority of the obstacles stem from a disconnect between the general public and the scientific community. Certainly, lack of communication has led to the problem with experience, transparency and unintentional misinformation. Moreover, perhaps the issues with the approach have also affected the experience and transparency. The two sectors' approach to communication and dissemination is flawed. Finally, the most complex is the effects of bias, which can lead to intentional misinformation. In an increasingly polarized environment, decisions that should be bipartisan have become about party affiliation rather than the issue itself. In the worst cases, some have taken it so far as to intentionally delude in order to gain support.

DATA AND FINDINGS

Objectivity/political involvement:	Experience:	Approach:	Transparency:	Intentional and unintentional misinformation:
People hesitate to trust the industry because of its possible bias.	Individual's experience or lack thereof leads them to distrust experts and/or not understand the issue	The approaches that scientists and the public takes towards discussing science can make the issue convoluted and/ or unapproachable	The public often doubts science because of the transparency of the industry	Both intentional and unintentional actions has led to widespread misinformation on topics
<p>"Americans are divided along party lines in terms of how they view the value and objectivity of scientists" (Trust and Mistrust)</p> <p>"Scientists judgments are just as likely to be biased as other people's" (Trust and Mistrust)</p> <p>"Language that makes them highly palatable to parents and difficult for scientists to object to, ... terms such as "informed consent," "health freedom," and "vaccine safety"" (Vaccine Rejection)</p> <p>"financial relationships between research sponsors and institutions have to cause bias ... large universities treat their science divisions as money makers" (Openness in Science)</p>	<p>"Higher levels of familiarity with the works of scientists are associated with more positive and more trusting views of scientists" (Trust and Mistrust)</p> <p>"Trust science practitioners...more than researchers" (Trust and Mistrust)</p> <p>"Today, even many physicians have not seen a case of measles, diphtheria [etc]... As such, anti vaccine activists have been able to describe these diseases as harmless consequences of childhood, and vaccines are presented as the danger rather than the disease." (Vaccine Rejection)</p> <p>" many fields of science are poorly understood by the wider public" (Openness in Science)</p>	<p>"Trust in science is ... discussed only in response to some scandal or controversy, such as misconduct... Such a focus on bad behaviour, [equates] concerns about trust with misconduct" (Openness in Science)</p> <p>"Things can and do go wrong in science in countless ways ... Too often, scientists do not consider the need for improvements ... Science's ability to weed out incorrect findings is overstated" (Openness in Science)</p>	<p>"No more than two-in-ten Americans believe that scientists across these groups are transparent about potential conflicts of interest with industry" (Trust and Mistrust)</p> <p>"Minorities say scientists regularly admit their mistakes" (Trust and Mistrust)</p> <p>"Open public access to data and independent committee reviews inspire the most confidence in scientists" (Trust and Mistrust)</p> <p>"lack the direct contact with individuals" (Vaccine Rejection)</p>	<p>"The latter argument misses the point of vaccination entirely" (Vaccine Rejection)</p> <p>"circulated by a variety of influential individuals and organizations (Table 2) and are read and repeated by parents and other media consumers" (Vaccine Rejection)</p> <p>"relatively few discuss these findings with a healthcare professional" (Vaccine Rejection)</p> <p>"most anti-vaccine tropes are individuals or groups who benefit from the spread of such inaccuracies" (Vaccine Rejection)</p> <p>"parents may not always believe or know their information has been filtered through these individuals [and] ... influenced by such" (Vaccine Rejection)</p>

IMPLICATIONS AND NEXT STEPS

In general, a main takeaway from this research is the need to improve communication and education. It would be beneficial to create media for the public and also host methods for people to ask questions and gain experience. Moreover, training should be done to decrease the influence of objectivity and outside relationships. This will be a complex endeavor, but it is important to start. To have a second inquiry that includes interviews and surveys of the public would be useful. One might ask the public more in depth about why they may not trust the industry and also about what would be helpful in increasing their trust.

ACKNOWLEDGEMENTS / REFERENCES

***Special thanks to Deanna Chute, and my mentor Michael Koehler for helping make this project possible.

***Works Cited:

- Funk, C., Hefferon, M., Kennedy, B., & Johnson, C. (2019, December 30). Trust and Mistrust in Americans' Views of Scientific Experts. Retrieved from <https://www.pewresearch.org/science/2019/08/02/trust-and-mistrust-in-americans-views-of-scientific-experts/>
- Hussain, A., Ali, S., Ahmed, M., & Hussain, S. (2018). The Anti-vaccination Movement: A Regression in Modern Medicine. *Cureus*, 10(7), e2919. doi:10.7759/cureus.2919
- Institute of Medicine (US) Immunization Safety Review Committee. (2004). Immunization safety review: vaccines and autism. In *Immunization Safety Review: Vaccines and Autism*. National Academies Press (US).
- Poland, G. A., & Jacobson, R. M. (2001). Understanding those who do not understand: a brief review of the anti-vaccine movement. *Vaccine*, 19(17-19), 2440-2445.
- Smith, T. C. (2017, July 18). Vaccine Rejection and Hesitancy: A Review and Call to Action. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5597904/>
- Yarborough, M. (2014). Openness in science is key to keeping public trust. *Nature*, 515(7527), 313-313. doi: 10.1038/515313a