

Health Scare of 22 Years: How a Corrupted Study Has Forever Changed Vaccines

Veronica Sulima

Senior Division, Historical Paper

2,500 words

I chose to do the anti-vaccination movement because I am interested in medicine, and I was very intrigued by how the anti-vaccination movement could exist with the overwhelming amount of evidence debunking their views. It relates back to the theme because I realized that anti-vax people were simply scared; they were uneducated on the matter and did not receive any answers they wanted from the medical community, and the anti-vaccination community was able to answer all their questions, even if the given information was false. I started my research by finding the original studies claiming a connection between vaccines and autism, and then I found medical journals that made responses or studies. As I was researching, I realized that most of the journals did not address the situation until the late 2000's, several years after the initial publication. I also noticed that many sources commented that social media has blown up the movement and has allowed it to spread much faster. After identifying a consistent pattern in my research, I formulated the argument that the government's delayed response and the large anti-vax presence online has fueled the movement. Since 1998, vaccination rates have continued to fall, as supporters' general distrust for the government grows. We can still see the effects today, especially with the COVID-19 being distributed.

On February 28, 1998, Dr. Andrew Wakefield and eleven co-authors published the infamous study "Ileal-lymphoid-nodular Hyperplasia, Non-specific Colitis, and Pervasive Developmental Disorder in Children" in the popular scientific journal *The Lancet*, unknowingly triggering a worldwide movement still raging over 20 years later. In the study, Wakefield falsely implied the measles, mumps, and rubella (MMR) vaccine disrupted the stomach and intestines, leading to peptides leaving the stomach, travelling through the bloodstream to the brain, affecting children's development, directly causing the 'pervasive developmental disorder' autism.¹ Since the publication, the anti-vaccination, or anti-vax movement has taken off, using social media to spread their views, with twice the amount of anti-vaccination groups than pro-vaccination pages, with no attempt from the government to regulate or correct false information stemming from the anti-vax movement.² Anti-vaccination groups are welcoming, easy to access, and able to answer every posed question, even if the answer was false. If people didn't know better, it would've been very easy to believe everyone else online. The false connection between vaccines and autism by reputable sources, a lack of prompt response from the medical community and government, and the establishment of the anti-vaccination community on major social media platforms has had negative medical and social effects that still linger in today's society, causing mistrust in the government and all-time low rates of vaccination.

The first widespread vaccine was created in England by Edward Jenner for smallpox in the early 1800s.³ It was met with heavy opposition, with some worried about sanitation, since the flesh was scored off and cowpox was injected, and others refused it for religious reasons because it contained animal product.⁴ The Vaccination Act of 1853 required children to be vaccinated,

1 Gerber, Jeffrey S., and Paul A. Offit. "Vaccines and Autism: A Tale of Shifting Hypothesis." *Clinical Infectious Disease*, February 15, 2009, 1-10. PDF.

2 Rutschman, Ana Santos. "Facebook's Latest Attempt to Address Vaccine Misinformation—And Why It's Not Enough." *Health Affairs Blog*. Entry posted November 5, 2020. Accessed January 15, 2021. <https://www.healthaffairs.org/doi/10.1377/hblog20201029.23107/full/>.

3 "History of Anti-vaccination Movements." *The History of Vaccines*. Last modified January 10, 2018. Accessed February 24, 2021.

4 "History of Anti-vaccination Movements." *The History of Vaccines*.

leading to the creation of the first anti-vaccination leagues. Parents who refused vaccination were glorified by crowds of people who cheered for them as they were led to jail.⁵ Towards the end of the 19th century, vaccines were brought to the United States. After a visit from British anti-vaccinationist William Tebb, the Anti Vaccination Society of America was founded in 1879.⁶ In 1905, the Supreme Court heard the landmark case *Jacobson v. Massachusetts*. Massachusetts mandated all city residents be vaccinated against smallpox in 1902. City Resident Henning Jacobson refused vaccination claiming the law violated his right to care for his own body. In turn, the city filed criminal charges against him. After losing, Jacobson appealed to the U.S. Supreme Court, which ruled in the state's favor,⁷ further involving the government in the anti-vaccination movement and strengthening their stance on vaccination rights. This decision strengthened vaccine mandates but also further outraged the anti-vaxxers fighting against them.

In the mid 1970s there was international controversy over the DTP vaccination in response to a report from the Great Ormond Street Hospital in London, alleging that 36 children suffered neurological conditions following DTP immunization.⁸ In 1982, reporter Lea Thompson reignited the movement with her documentary, *DPT: Vaccine Roulette*, which linked a range of childhood disabilities to the DTP vaccine, causing numerous lawsuits against the vaccine's manufacturers.⁹ Beginning in the 1990s, the movement was fueled by talk shows that featured anti-vaccination celebrities. Unlike in the past, these shows were able to reach millions of people.¹⁰ The turning point in the movement when it truly began to grow and be recognized was

5 Ibid

6 Ibid

7 Ibid

8 Ibid

9 "History of Anti-vaccination Movements." The History of Vaccines. Last modified January 10, 2018. Accessed February 24, 2021. <https://www.historyofvaccines.org/content/articles/history-anti-vaccination-movements>.

10 "History of Anti-vaccination Movements." The History of Vaccines.

in 1998 when Dr. Wakefield published his studies.¹¹ In 2004 the *Lancet* admitted they should not have published the paper and retracted the study in 2010--the same year Wakefield lost his medical license. In the early 2000s the anti-vaccination movement transitioned online, establishing themselves on websites and large social media platforms. Experts have since seen an exponential increase in the anti-vax movement.

The medical community should be the most reliable fountain of information, but sometimes it fails the public. For example, The *Lancet* is considered the world's most credible and oldest medical journal, with an impact factor of 59, making it the most influential journal in the world.¹² An impact factor is a measure of how frequently a particular journal is cited in a year. It is used to measure the importance or rank of a journal by calculating the times it's articles are cited. The average score is a one, with a score of ten considered excellent.¹³ When the *Lancet* published the doctors' report, it was met by a large audience who had good reason to believe it was true; people had a legitimate reason to avoid vaccinating their children. In April 2000, Wakefield published another faulty study with a different set of co-authors in the journal *Digestive Disease and Sciences*, a journal that specializes in gastrointestinal sciences. The journal has an impact factor of 3, so it's not as impactful as The *Lancet*, but it is above average. In the false study, Wakefield tests children with different stomach and intestinal problems and children with autism for the MMR virus. He concludes that children with autism tested positive for the vaccine strain of the virus.¹⁴ Since the journal is smaller than The *Lancet*, it did not receive the same attention as his first study.

¹¹ Ibid

¹² Grewal, Kairvy. "The Lancet, World's Most Credible Medical Journal Whose Trust Has Been Hit by HCQ Scandal." The Print. Last modified June 8, 2020.

Accessed January 31, 2021. <https://theprint.in/theprint-essential/the-lancet-worlds-most-credible-medical-journal-whose-trust-has-been-hit-by-hcq-scandal/436452/>.

¹³ Grewal, Kairvy. "The Lancet, World's Most Credible Medical Journal Whose Trust Has Been Hit by HCQ Scandal." The Print. Last modified June 8, 2020. Accessed January 31, 2021.

¹⁴ Kawashima, Hisashi, Takayuki Mori, Yasuyo Kashiwagi, Kouji Takekuma, Akinori Hoshika, and Andrew Wakefield. "Detection and Sequencing of Measles Virus from Peripheral Mononuclear Cells from Patients with Inflammatory Bowel Disease and Autism." *Digestive Disease and Sciences* 45 (April 2000): 723-29. PDF

Both studies originally seemed to be done according to standard, but after review from other journals, several flaws were found. For example, the Wakefield studies were lacking a control group; there were false connections between children's first MMR vaccine in the same period that symptoms of autism began to appear; the data collected was biased and incomplete; several children diagnosed with autism have never had any stomach symptoms reported in the studies, and finally, there has never been any evidence of peptides leaving the stomach travelling to the brain.¹⁵ Contrary to Wakefield's hypothesis, extensive studies by NIH and CDC have found that autism is connected to genetics and chromosomes.¹⁶ Furthermore, the doctor who initiated all the false studies, Andrew Wakefield, was found to have acted unethically while conducting his studies and lost his medical license in 2010.¹⁷ Wakefield has been accused of carrying out unnecessary and invasive tests on children without permission, including paying parents at his son's birthday party to collect their children's blood.¹⁸ Additionally, Wakefield was found to have extensive financial ties to law firms and families that were filing lawsuits against manufacturers of the vaccine, and that most of the participants in the studies were engaged in a lawsuit.¹⁹ This discovery has led many to believe that Wakefield was paid by the firm to conduct a false, biased study so they could have evidence in court. He has denied all allegations, claiming that there was correspondence between *The Lancet's* chief editor, Dr. Horton, and Dawbarns, a law firm representing the parents. Wakefield also claimed that months before the study was published, the editor and firm were discussing Wakefield's work on behalf of the litigants. While

15 Gerber, Jeffrey S., and Paul A. Offit. "Vaccines and Autism: A Tale of Shifting Hypothesis." *Clinical Infectious Disease*, February 15, 2009, 1-10. PDF.

16 Halsey, Neal A., Susan L. Hyman, and Conference Writing Panel. "Measles-Mumps-Rubella Vaccine and Autism Spectrum Disorder." *Pediatrics* 107 (May 5, 2001): 1-23. PDF.

17 New York State Department of Health. "The Truth about Autism." New York State. Accessed January 14, 2021. https://www.health.ny.gov/prevention/immunization/vaccine_safety/truth_about_autism.htm.

18 "Controversial Autism Doctor Stripped of License." HCPLive. Last modified May 24, 2010. Accessed January 22, 2021. https://www.hcplive.com/view/autism_doctor.

19 Dyer, Owen. "Wakefield Admits Fabricating Events When He Took Children's Blood Samples." *BMJ* 336, no. 7649 (April 17, 2008): 850.1-850. Accessed January 26, 2021. <https://dx.doi.org/10.1136%2Fbmj.39553.506597.DB>.

Wakefield was “not impugning Dr. Horton’s honesty,” the documents proved in his opinion “that he was aware of all these factors.”²⁰ Dr. Horton denied, from the beginning, any involvement or knowledge of the lawsuits.²¹ The evidence, as it stands, strongly suggests that Wakefield was paid for the studies and the only evidence that the editor had knowledge of the lawsuit was from Wakefield’s testimony. While it is impossible to know who is telling the truth, it is impossible to ignore the money trail left by Wakefield.²²

Since losing his license, Wakefield moved from the United Kingdom to the United States, abandoning science to be one of the largest names in today’s anti-vaccination movement, travelling the country to attend protests and give speeches.²³ The *Lancet* made several statements and has fully recovered from the incident, regaining their credibility.

We know that the studies conducted by Andrew Wakefield are false: the conclusions have been debunked several times. But most reputable sources did not release refuting statements and studies until more than ten years after the study was published. For example, the CDC released its first statement after 2013.²⁴ When searching the National Library of Medicine, most pro-vaccination articles were published in 2009, roughly 11 years after the study, and more recently late 2020 and early 2021. A few sources responded in a reasonable time frame, like the American Academy of Pediatrics (AAP) and the United States Public Health Services (USPH) who released a joint statement in 1999, disproving online theories that had emerged since the study was published, establishing the safety of vaccines, though these prompt responses were few and far between.²⁵ The public was still struck with terror, worried that routine vaccines could

20 Ibid

21 "Controversial Autism Doctor Stripped of License." HCPLive. Last modified May 24, 2010.

22 Dyer, Owen. "Wakefield Admits Fabricating Events When He Took Children's Blood Samples." *BMJ* 336, no. 7649 (April 17, 2008)

23 "Controversial Autism Doctor Stripped of License." HCPLive. Last modified May 24, 2010.

24 CDC. "Autism and Vaccines." Centers for Disease Control and Prevention. Accessed January 14, 2021. <https://www.cdc.gov/vaccinesafety/concerns/autism.html>

25 American Academy of Pediatrics, and United States Public Health Services. "Joint Statement of the AAP and USPHS." *Pediatrics* 104 (September 3, 1999): 568-69. PDF.

cause harm, and the lack of response from medical professionals further exacerbated this terror. US vaccination rates fell below 80%,²⁶ the UK lost its measles-free status dictated by the World Health Organization,(WHO) and had a marked decline in vaccination rates for all 13 vaccine preventable diseases:²⁷ “In 2017, there were 284 cases of measles in England, increasing to 991 in 2018. In the 53 countries of the WHO European Region, cases of measles leapt from 5,273 in 2016, to 83,540 in 2018. In 2017, Ukraine alone exceeded 50,000 cases. The USA had 2,000 cases in 2019, having 372 in 2018.”²⁸ Parents began to refuse to vaccinate their children, a trend that’s been increasing exponentially in recent years. As a result, in 2006, a 13 year old unvaccinated boy died from measles. Prior to that, the last reported death from measles was in 1992.²⁹ If there isn’t a drastic change soon, we should prepare to see more deaths of unvaccinated children from vaccine preventable diseases.³⁰ With vaccination rates falling yearly³¹ and the COVID-19 vaccine being distributed, the government has had a reignited urgency to stop the spread of misinformation³², with large medical associations and journals releasing multiple statements. But, over twenty years after the study was published, the damage has been done: people have run rampant with theories and are stuck on their beliefs. The lack of government response for so long only added to the anti-vaxers' confidence and fueled a false narrative. People needed the reassurance of the safety of vaccines in the first year of the study, when they were open to conversation and accepting that vaccines were vital. Overall, the medical

26 Dyer, Owen. "Wakefield Admits Fabricating Events When He Took Children's Blood Samples." *BMJ* 336, no. 7649 (April 17, 2008)

27 Spring, Marianna. "Covid-19: Stop Anti-vaccination Fake News Online with New Law Says Labour." News release. November 15, 2020. Accessed December 15, 2020. <https://www.bbc.com/news/uk-politics-54947661>.

28 "Vaccine Misinformation and Social Media." *The Lancet Digital Health* 1, no. 6 (October 1, 2019): e258-e259. Accessed January 15, 2021. [https://doi.org/10.1016/S2589-7500\(19\)30136-0](https://doi.org/10.1016/S2589-7500(19)30136-0).

29 "Controversial Autism Doctor Stripped of License." *HCPLive*. Last modified May 24, 2010.

30 *Autism: Present Challenges, Future Needs--Why the Increased Rates?: Hearings Before the Government Reform*, 106th Cong., 2d Sess. (2000). Accessed January 5, 2021. <https://www.govinfo.gov/content/pkg/CHRG-106hhrg69622/html/CHRG-106hhrg69622.htm>.

31 New York State Department of Health. "The Truth about Autism." New York State. Accessed January 14, 2021. https://www.health.ny.gov/prevention/immunization/vaccine_safety/truth_about_autism.htm.

32 Berman, Jonathon. "Q&A: The Trouble with the Anti-Vaxer Movement." Interview by Casey Pearce. New York Institute of Technology. Last modified October 14, 2020. Accessed January 15, 2021. https://www.nyit.edu/box/features/qa_the_trouble_with_the_anti_vaxer_movement.

community has published several exceptional studies only after years of silence, putting in an effort when the movement was out of control and 39% of people in America were refusing the COVID-19 vaccine.³³

The anti-vax community has taken over social media platforms, with little to no regulation for several years. While it's important to not infringe on people's freedom of speech, it's far more important and practical to regulate pages and stop the spread of false information and assure people are vaccinating their children and protecting others around them. Since the emergence of the global pandemic, anti-vaccination accounts have been spouting misleading data and have gained a significant following, bringing the total followers of anti-vaccine content on social media to close to 60 million. During the first months of the pandemic, Facebook had more than 850,000 users start following pages that share vaccine misinformation. This brings the total number of Facebook users who follow groups conveying misinformation to around 30 million—roughly half of the followers across the largest social media platforms.³⁴ Around a third of respondents to a six-country survey by the Reuters Institute for the Study of Journalism reported that they had seen “a lot or a great deal of false or misleading” information about COVID-19 on social media during the previous week.³⁵ The WHO concluded the anti-vaccination movement is largely amplified by social media.³⁶

The looming question is why haven't social media platforms taken action sooner? The answer lies in the revenue made from these pages. The CCDH calculated that the anti-vaccine movement could accumulate in the US up to \$1 billion in annual revenues for social media firms.

33 "Vaccine Misinformation and Social Media." *The Lancet Digital Health* 1, no. 6 (October 1, 2019): e258-e259. Accessed January 15, 2021.

34 Rutschman, Ana Santos. "Facebook's Latest Attempt to Address Vaccine Misinformation—And Why It's Not Enough." *Health Affairs Blog*. Entry posted November 5, 2020.

35 Burki, Talha. "The Online Anti-vaccine Movement in the Age of COVID-19." *The Lancet Digital Health* 2, no. 10 (October 2020): e504-e505. Accessed January 15, 2021.

[https://doi.org/10.1016/S2589-7500\(20\)30227-](https://doi.org/10.1016/S2589-7500(20)30227-)

36 Ibid

As much as \$989 million comes from Facebook and Instagram alone.³⁷ This also explains why Facebook is the most popular choice by anti-vaxxers, since Facebook uses ‘market funnel’ strategies; the viewing and following of anti-vax pages would expose the viewer to more anti-vaccine content papers and newsletters, and alternative medicine products, like dietary supplements or essential oils.³⁸ Following major backlash from health organizations, social media platforms have announced new measures to stop the spread of false information. On October 13th 2020, Facebook announced they are no longer allowing ads with misinformation that could harm public health efforts to promote vaccine trust.³⁹ The CCDH doesn’t believe there are enough measures in place, since nothing was done about the large circulation of vaccine misinformation, and it does nothing to remove the sources of vaccine misinformation within the Facebook network.⁴⁰ Other platforms followed suit, with YouTube announcing it would start removing videos conveying vaccine misinformation, building on an existing policy to delete misinformation related to COVID-19. Twitter has had a similar COVID-19 misinformation policy since March 2020. Pinterest eliminated misleading results for vaccine searches even before the pandemic in late 2019 and later redirected searches to content from credible public health organizations.⁴¹ The CCDH remains unconvinced that these platforms are doing enough, conducting a study after the new guidelines were implemented. Their data showed that out of 912 posts containing misinformation about COVID-19, fewer than one in 20 were dealt with by social media companies.⁴² One mother who used to participate in online anti-vaccination groups said “Anti-vaxxers have been around for a long time, but social media makes it easier to get into

37 Ibid

38 Rutschman, Ana Santos. "Facebook's Latest Attempt to Address Vaccine Misinformation—And Why It's Not Enough." Health Affairs Blog. Entry posted November 5, 2020.

39 Ibid

40 Rutschman, Ana Santos. "Facebook's Latest Attempt to Address Vaccine Misinformation—And Why It's Not Enough." Health Affairs Blog. Entry posted November 5, 2020.

41 Ibid

42 Burki, Talha. "The Online Anti-vaccine Movement in the Age of COVID-19." *The Lancet Digital Health* 2, no. 10 (October 2020): e504-e505. Accessed January 15, 2021.

a loop. And once you're there, it's hard to see outside of it. Algorithms just show you more of what you're already looking for. If you start searching anti-vaccination stories, that's what starts popping up on your tagline."⁴³ It is an important step to remove any revenue from pages, but they are still free to post whatever they like, including harmful information that promotes abstaining from vaccinating your children. It is vital to not only stop the flow of misleading information, but to circulate correct facts from credible sources to help rebuild trust for vaccines and the government. The more information available, the less fear there will be. The government and medical community have more than enough resources to adapt and use social media to their advantage. Right now, the anti-vaccine movement is dominating social media, but the government can replace the false information with correct news and bring the movement to a near halt.⁴⁴

The false study connecting autism to the MMR vaccine was published over twenty years ago, but the effects can still be seen today. I firmly believe people are not part of the anti-vaccination movement to purposely put others at risk or to be a nuisance, but because they are scared and whole-heartedly believe they are doing what is best for themselves and their children. If we take the time to educate people and make credible sources easier to access all over the internet, people won't feel the need to find answers elsewhere. If the government increases communication and transparency, they will slow the anti-vax movement and vaccine rates can again begin to rise. We cannot continue to brush off the ever-growing movement, especially with the COVID-19 vaccine being distributed.

43 Glionna, John M, "Interview: Anti-Vaccine Advocate Switched Sides to Promote Immunization." Kaiser Health News (blog). Entry posted August 5, 2019. Accessed January 15, 2021. <https://www.kqed.org/science/1946140/interview-anti-vaccine-advocate-switched-sides-now-promotes-immunization>.

44 Hoffman, Beth L., Elizabeth M. Felter, Kar-Hai Chu, Ariel Shensa, Chad Hermann, Todd Wolynn, Daria Williams, and Brian A. Primack. "It's Not All about Autism: The Emerging Landscape of Anti-vaccination Sentiment on Facebook." *Vaccine* 37, no. 16 (April 2019): 2216-23. Accessed January 15, 2021. <https://doi.org/10.1016/j.vaccine.2019.03.003>.

Bibliography

Primary Sources

American Academy of Pediatrics, and United States Public Health Services. "Joint Statement of the AAP and USPHS." *Pediatrics* 104 (September 3, 1999): 568-69. PDF.

This article was published in the journal *Pediatrics*, and gives a statement regarding vaccines causing autism. This was one of the fastest responses from the government, less than a year after the study was first published. I will use this source to show the difference in government responses, since there were one or two statements within the first few years, but most came over a decade after, when it was much too late.

Autism: Present Challenges, Future Needs--Why the Increased Rates?: Hearings Before the Government Reform, 106th Cong., 2d Sess. (2000). Accessed January 5, 2021. <https://www.govinfo.gov/content/pkg/CHRG-106hrg69622/html/CHRG-106hrg69622.htm>.

This hearing addresses the American public's concern over the potential link between autism and vaccines since the study in 1998. Although there is no plausible scientific evidence of a connection, there are many families who believe their child's autism could be linked back to a vaccine. This source will be important for the primary sources and the insight it gives into the public's reaction.

Berman, Jonathon. "Q&A: The Trouble with the Anti-Vaxxer Movement." Interview by Casey Pearce. New York Institute of Technology. Last modified October 14, 2020. Accessed January 15, 2021. https://www.nyit.edu/box/features/qa_the_trouble_with_the_anti_vaxxer_movement.

This interview with Dr. Berman helps to express the urgency for the government to take hold of the anti-vaccination movement. With the COVID-19 vaccine on its way, it is more important than ever that people are persuaded to immunity. In an attempt to vaccinate as many people as possible, the media has been revisiting the topic, trying to ease the tension after a long period of silence.

DeStefano, Frank, Tanya Karapurkar Bhasin, William W. Thompson, Marshalyn Yeargin-Allsopp, and Coleen Boyle. "Age at First Measles-mumps-rubella Vaccination in Children with Autism and School-matched Control Subjects: A Population-based Study in Metropolitan Atlanta." *Pediatrics*, February 2004. Accessed January 14, 2021. <https://pubmed.ncbi.nlm.nih.gov/14754936/>.

This study was published in *Pediatrics*, a journal that publishes regularly, run by the American Pediatrics Association. The journal has published multiple studies about the false theory, most published in the mid-2000s. Although the journal has published several well executed studies, like many other credible sources, it was several years after the initial publication.

Glionna, John M, "Interview: Anti-Vaccine Advocate Switched Sides to Promote Immunization." *Kaiser Health News* (blog). Entry posted August 5, 2019. Accessed January 15, 2021. <https://www.kqed.org/science/1946140/interview-anti-vaccine-advocate-switched-sides-now-promotes-immunization>.

This blog interviews a mother who used to be against vaccination. The mother said that she became anti-vaccination out of fear, and because social media will immerse you in theories that can be very overwhelming. I will use this source to show that the government isn't doing enough to shut down harmful groups and pages on social media, and that is why the situation is as bad as it is.

Hoffman, Beth L., Elizabeth M. Felter, Kar-Hai Chu, Ariel Shensa, Chad Hermann, Todd Wolynn, Daria Williams, and Brian A. Primack. "It's Not All about Autism: The Emerging Landscape of Anti-vaccination Sentiment on Facebook." *Vaccine* 37, no. 16 (April 2019): 2216-23. Accessed January 15, 2021. <https://doi.org/10.1016/j.vaccine.2019.03.003>.

Vaccine is a journal that targets medical professionals interested in vaccines. They conducted a study on the anti-vaccination groups on Facebook, and that there were different categories of people who were against vaccination, all of which were sparsely regulated. These groups are very dangerous, since they act as an echo chamber and someone stumbling upon one of these groups can easily get sucked in unknowingly.

Kawashima, Hisashi, Takayuki Mori, Yasuyo Kashiwagi, Kouji Takekuma, Akinori Hoshika, and Andrew Wakefield. "Detection and Sequencing of Measles Virus from Peripheral Mononuclear Cells from Patients with Inflammatory Bowel Disease and Autism." *Digestive Disease and Sciences* 45 (April 2000): 723-29. PDF.

This publication caused widespread panic and a large distrust in the government. The main author, Andrew Wakefield, had his medical license revoked, yet people still value his word as if it came from a trusted professional. Since both the journal and authors who published the article failed to take accountability for their actions, many view them as heroes who were forced to be silenced by the government.

Taylor, Brent, Elizabeth Miller, and C. Paddy Farrington. "Response to the MMR Question." *The Lancet* 356, no. 9237 (October 2000): 1273. Accessed January 15, 2021. [https://doi.org/10.1016/S0140-6736\(05\)73875-7](https://doi.org/10.1016/S0140-6736(05)73875-7).

In this article, the *Lancet* is attempting to defend their first study, though they are hesitant to admit their study was wrong. The authors snap back at criticism from other scientists. This swift, although immature response did not help ease the tension and panic it had caused. By not taking accountability and lashing out at anyone who offers feedback, it built a similar mindset for people who became anti-vaccination.

Taylor, Luke E., Amy L. Swerdfeger, and Guy D. Eslick. "Vaccines Are Not Associated with Autism." *Vaccine*, April 23, 2014, 3624-29. PDF.

Vaccine is a journal whose aim is to provide the most relevant and correct information. In this issue, they conduct their own study to see if there is a correlation between vaccines and autism, which there is not. This source helps me because it is a primary source and walks through their data.

Wakefield, A. J., S. H. Murch, A. Anthony, J. Linnell, D. M. Casson, M. Malik, M. Berelowitz, A. P. Dhillon, M. A. Thomson, P. Harvey, A. Valentine, S. E. Davies, and J. A. Walker-Smith. "Ileal-lymphoid-nodular Hyperplasia, Non-specific Colitis, and Pervasive Developmental Disorder in Children." *The Lancet* 351 (February 28, 1998): 637-41. PDF.

This is a retracted, debunked article, that is infamous for starting the anti-vaccination movement. I will not use it for accurate information, but just to give some background information on the initiation of the movement.

Wakefield, Andrew J. "MMR Vaccination and Autism." *The Lancet* 354, no. 9182 (September 1999): 949-50. Accessed January 15, 2021.
[https://doi.org/10.1016/S0140-6736\(05\)75696-8](https://doi.org/10.1016/S0140-6736(05)75696-8).

This article is the Lancet's first response to their false study. Written solely by one of the eleven scientists, Wakefield is not willing to admit total defeat. It was vital that the first thing Wakefield did was shut down any rumors, but he instead allowed the situation to drag on. This source helps show there was no adequate response or accountability from any important figures.

Wakefield, Andrew J., Peter Harvey, and John Linnell. "MMR—responding to Retraction." *The Lancet* 363, no. 9417 (April 2004): 1327-28. Accessed January 15, 2021.
[https://doi.org/10.1016/S0140-6736\(04\)16017-0](https://doi.org/10.1016/S0140-6736(04)16017-0).

In this article by the Lancet, a few of the original authors of the initial study connecting autism to vaccines make an official statement about their work. Although they were late, they finally addressed it six years after the first publication. When they wait so long, they're allowing the theories to run wild, and people have gone so long without hearing anything that it'll be impossible to get everyone to listen.

Secondary Sources

"Autism and Vaccines." Autism Science Foundation. Accessed January 14, 2021.
<https://autismsciencefoundation.org/what-is-autism/autism-and-vaccines/>.

This is a statement from the Autism Science Foundation's website, which is a popular resource for parents whose children are diagnosed with autism. The foundation is dedicated entirely to producing the most relevant and accurate information possible, so I used it to show how some families affected by autism are blaming vaccines, but many are still paying attention to the current evidence.

Burki, Talha. "The Online Anti-vaccine Movement in the Age of COVID-19." *The Lancet Digital Health* 2, no. 10 (October 2020): e504-e505. Accessed January 15, 2021. [https://doi.org/10.1016/S2589-7500\(20\)30227-2](https://doi.org/10.1016/S2589-7500(20)30227-2).

This article by *The Lancet* analyzes how social media has affected the anti-vaccination movement. The original study warned of vaccines causing autism, but online groups have spread theories like wildfire, so there are now millions of reasons to not vaccinate your child. With the COVID-19 vaccine being distributed, people are looking for answers and are stumbling into such groups.

"Vaccine Misinformation and Social Media." *The Lancet Digital Health* 1, no. 6 (October 1, 2019): e258-e259. Accessed January 15, 2021. [https://doi.org/10.1016/S2589-7500\(19\)30136-0](https://doi.org/10.1016/S2589-7500(19)30136-0).

The Lancet is a world leading journal, and is considered one of the world's most credible sources. It impacts my research because they published the infamous article first stating a link between the MMR vaccine and autism. They have published eight articles since the controversy, stating it was a mistake and there is no evidence. I will use this article to show how they handled the situation and their responses compared to the rest of the medical community.

"Autism and Vaccines." Centers for Disease Control and Prevention. Accessed January 14, 2021. <https://www.cdc.gov/vaccinesafety/concerns/autism.html>.

This article is from a very credible source, so I know for sure all the information is accurate and is valid for my argument. I used this source for official definitions and to give an example of the government's response.

"CDC Statement: 2004 MMR and Autism Study." Centers for Disease Control and Prevention. Accessed January 14, 2021. <https://www.cdc.gov/vaccinesafety/concerns/autism/cdc2004pediatrics.html>.

This article briefly goes over evidence in past studies, disproving the link between MMR and autism. As the CDC's official statement, it is vital to my research because my argument is that the government did not respond in time to stop the widespread panic. This source helped me to understand why the theories have gotten so crazy, since this statement was only given after 2019.

College of Physicians of Philadelphia. "Do Vaccines Cause Autism?" History of Vaccines. Last modified January 25, 2020. Accessed December 15, 2020. <https://www.historyofvaccines.org/content/articles/do-vaccines-cause-autism>.

I used this article as initial inspiration for my topic and to find other sources. I have a center of information and an almost complete history of the scandal.

"Controversial Autism Doctor Stripped of License." HCPLive. Last modified May 24, 2010. Accessed January 22, 2021. https://www.hcplive.com/view/autism_doctor.

HCPLive is a news outlet that focuses on breaking news in the science community. They published an article in 2010 that Andrew Wakefield, the main author of the infamous vaccine and autism article, is having his license stripped. For over ten years, Wakefield has been giving official statements defending his study, even after *The Lancet* retracted his article. This is a prime example of the government acting much too slow. By

then, the damage had been done, and Wakefield had a significant following, so even now that they stripped him of his license, people still will believe every word he says.

Dyer, Owen. "Wakefield Admits Fabricating Events When He Took Children's Blood Samples." *BMJ* 336, no. 7649 (April 17, 2008): 850.1-850. Accessed January 26, 2021. <https://dx.doi.org/10.1136%2Fbmj.39553.506597.DB>.

The *BMJ* is one of the most respected scientific journals, and the fourth most cited journal in the world. They are a highly credible source that is consistently producing the most relevant and accurate scientific information. I will use this source to show how there was still new information being discovered over a decade after the initial publication of the study, and if there was a faster reaction the damage could have been minimized greatly.

Gerber, Jeffrey S., and Paul A. Offit. "Vaccines and Autism: A Tale of Shifting Hypothesis." *Clinical Infectious Disease*, February 15, 2009, 1-10. PDF.

The *Clinical Infectious Disease* is a journal published by the NIH. I used this source to gather information on my topic from a reliable source. I understand my topic better now because the article provides many different viewpoints and evidence.

Grewal, Kairvy. "The Lancet, World's Most Credible Medical Journal Whose Trust Has Been Hit by HCQ Scandal." *The Print*. Last modified June 8, 2020. Accessed January 31, 2021. <https://theprint.in/theprint-essential/the-lancet-worlds-most-credible-medical-journal-who-se-trust-has-been-hit-by-hcq-scandal/436452/>.

This is an article by a popular news station. It is about The *Lancet*, a popular medical journal, and a false study they published. I will be using this article to show the credibility and reach of The *Lancet*.

Halsey, Neal A., Susan L. Hyman, and Conference Writing Panel. "Measles-Mumps-Rubella Vaccine and Autism Spectrum Disorder." *Pediatrics* 107 (May 5, 2001): 1-23. PDF.

This article gives a report on a conference on childhood immunization. The source goes more into depth on Autism and what we know about it. In the process, it invalidates the theory that it could be caused by vaccines.

"History of Anti-vaccination Movements." *The History of Vaccines*. Last modified January 10, 2018. Accessed February 24, 2021. <https://www.historyofvaccines.org/content/articles/history-anti-vaccination-movements>.

This is an article from History of Anti-vaccination Movements, a website by the College of Physicians of Philadelphia. In the article they discuss the anti-vaccination movement and how it has evolved over the centuries. I used this source to make a timeline of the movement.

Iannelli, Vincent. "History of the Anti-Vaccine Movement." Edited by Ashley Hall. *Very Well Health*. Accessed February 24, 2021. <https://www.verywellhealth.com/history-anti-vaccine-movement-4054321>.

This is an article from Very Well Health that highlights key moments and changes throughout the anti-vaccination movement. This source was very helpful because it gave

me the most important moments throughout history and helped make my paper more clear.

Miller, Lisa, and Joni Reynolds. "Autism and Vaccination - the Current Evidence." *JSPN* 14 (July 2009): 166-72. PDF.

This article goes over vaccine history and safety, and numerous claims made about vaccines. This source helped me get a more thorough understanding of vaccines and how they are regulated. I used it to explain the safety measures for vaccines.

New York State Department of Health. "The Truth about Autism." New York State. Accessed January 14, 2021. https://www.health.ny.gov/prevention/immunization/vaccine_safety/truth_about_autism.htm.

The brief statement given by the New York State Department of Health (NYSDH) corroborates with other dependable sources that there is no link. This source is used to exemplify the government's response to the theories flying around.

Rutschman, Ana Santos. "Facebook's Latest Attempt to Address Vaccine Misinformation—And Why It's Not Enough." *Health Affairs Blog*. Entry posted November 5, 2020. Accessed January 15, 2021. <https://www.healthaffairs.org/doi/10.1377/hblog20201029.23107/full/>.

This blog, published by Health Affairs, who also publishes a highly credible scientific journal, outlines Facebook's new plans to attempt to rein in vaccination theories. But, it is too little too late, since this change came in late 2020, and theories have been raging for over 20 years. I will use this article to exemplify why vaccinations rates are continuing to fall.

Spring, Marianna. "Covid-19: Stop Anti-vaccination Fake News Online with New Law Says Labour." News release. November 15, 2020. Accessed December 15, 2020. <https://www.bbc.com/news/uk-politics-54947661>.

The article from BBC gave me insight on how the government is handling the conspiracy theories. I used this source to get an understanding on the government's role in the situation, and for some relevant information on the public's view of conspiracists.