

No Shots, No Problem: The Anti-Vaccination Movement on Social Media
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2023 Anthropology Capstone Reader
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Vaccine-hesitancy and vaccine rejection are huge problems facing global public health today. Diseases which were once considered to be virtually eliminated due to widespread vaccination are returning with a vengeance, as cases of measles, mumps and chickenpox pop up and spread throughout Europe and North America. As herd immunity diminishes, deadly infectious diseases spread more easily among vulnerable human hosts. This is all due to the growing trend of purposefully forgoing routine vaccinations. Anti-vaccine communities have been steadily growing online for years, and now wield a potent influence on social media. Widespread access to social media increases the ease with which misinformation about vaccines can spread and reach new audiences across the globe. In this paper, I will be seeking to answer the question: what is the anti-vaccine movement and how does this movement interact with social media? I will also examine what role identity plays in attracting new believers to the anti-vaccine community, if any.

The current global situation with the ongoing COVID-19 pandemic illustrates the importance of vaccines: life can only start to “go back to normal” once enough people are vaccinated and herd immunity is achieved against the SARS-CoV-2 virus. However, misinformation about the recently developed vaccines and mistrust of government and public health officials is rampant. Even those who do not consider themselves as “anti-vax” are cautious about the COVID-19 vaccine, likely because of information they came across online. In order to increase rates of vaccination, doctors and researchers should aim to understand vaccine-hesitancy so they can develop methods to effectively counter misinformation. This is where anthropologists may be able to help, by examining and understanding the motivations leading people to the anti-vaccine community. This may be very important in the future, as the COVID-19 vaccines become available to the general public, and of course, it may help to increase rates of routine

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vaccinations as well, to reduce future outbreaks of vaccine-preventable diseases. In addition, the work of anthropologists may shed light on how anti-vaccine activists appeal to social media users' identities to attract them to the movement. Anti-vaccine activists have tended to target women and parents, appealing to their identities specifically to draw them to the anti-vaccine cause. Anthropologists may be able to use this information to instead direct these groups toward credible scientific sources concerning vaccines.

BACKGROUND CONTEXT

Before delving more deeply into the issue, we should examine the question of what, exactly, is the anti-vaccination movement? Also referred to as anti-vaxxers, the anti-vaccination movement is composed of a loosely connected group of people, who believe, essentially, that vaccines are more harmful than beneficial. There are varying reasons for the belief that vaccines are harmful, including religious, political, scientific, health, or philosophical reasons (Calderon Rodriguez et al. 2019:130). Another common theme within the anti-vaccination movement is the right of parents to focus on the individual health of their child or children, without considering the potential health consequences to the wider community, should they choose to forgo routine vaccinations. Many anti-vax parents also believe they have a right to parent their children in the way that they see fit, without interference from the state (Calderon Rodriguez et al. 2019:130). In recent years, anti-vaccine beliefs have become increasingly entwined with various anti-government and anti-science conspiracy theories, mainly spread over social media. However, not all members of the anti-vaccine movement believe in other conspiracy theories. This is only a very brief overview of a large and ever-growing community.

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Vaccines have long been considered one of the most important innovations in the field of public healthcare. They originally emerged as a response to smallpox, a deadly infectious disease which devastated the populations it afflicted, often leaving those which it did not kill with permanent scarring or blindness (Lynam 2019:100). Epidemics of infectious disease such as smallpox have also historically been associated with high levels of mortality, devastating the populations they came into contact with (Sawchuk et al. 2013:459). Before vaccination was developed, populations fearing smallpox outbreaks depended on variolation for protection, which was noted to reduce the severity and lingering effects of the disease. This was a process not unlike a sort of proto vaccination, where patients were inoculated with pustule fluid taken from smallpox lesions (Lynam 2019:101). It is a great relief to think of the advances in vaccine production and safety which have occurred since that time. While variolation did offer some hope of protection against smallpox, it was not entirely effective, and unfortunately it also caused many of its recipients to contract syphilis, a dangerous, often sexually transmitted bacterial infection. Interestingly, there was also a vocal anti-variolation movement in the United States during the 1700s, similar to the anti-vaccination movement today. During the height of the Boston smallpox epidemic in 1721, Massachusetts Reverend John Williams described variolation as “the work of the devil” (Lynam 2019:101). This mirrors an opinion shared by some religious anti-vaccine extremists today, primarily evangelical Christians, who believe that vaccination is “the mark of the beast”, which refers to a passage from the Book of Revelation suggesting that Satan will test Christians by asking them to put a mark on their bodies.

Variolation subsequently led to vaccination when Edward Jenner, the so-called “father of immunology”, noticed that milkmaids who had been exposed to the similar but milder cowpox were seemingly immune to smallpox. This phenomenon had been observed before, but Jenner

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was the first to try inoculating subjects with the material from non-lethal cowpox pustules to provoke an immune reaction and protect against smallpox. In order to differentiate his newly developed inoculation process from variolation, Jenner named it vaccination (Lynam 2019:102). His new discovery turned out to be a major success. By the end of the eighteenth century, King Charles of Spain had learned of Jenner's research, and mandated that every citizen in Spain be vaccinated. This desire for vaccination was so strong in Europe, and particularly in Spain, because of several smallpox epidemics which had devastated the continent and caused the deaths of four European monarchs in the past century alone (Lynam 2019:102). Since Edward Jenner's day, vaccine production has become safer, more efficient, and much more highly regulated. Vaccines have been created to treat a variety of infectious diseases which once ran rampant, including measles, rubella, mumps, chickenpox, smallpox, diphtheria, tuberculosis, and polio. More recently, a vaccine has been created for Ebola, a contagious hemorrhagic fever disease with a high level of mortality, and even more recently, for COVID-19.

Most of the anti-vaccination sentiment originating in Jenner's time has similar roots to anti-vaccination sentiment today. Some of the main reasons why anti-vaccination activists began protesting against vaccines included finances, skepticism, and religious, political or legal arguments (Lynam 2019:103). Most of these reasons are still used by the anti-vaccine movement today, and anti-vaxxers argue that the decline in rates of vaccine-preventable diseases is due to improvements in sanitation, better nutrition, and increasing sociopolitical equality, rather than vaccines (Conis 2013:424). Many of the current arguments against vaccination stem from a discredited 1998 paper written by an English physician, Andrew Wakefield (Lynam 2019:104). Wakefield's now infamous paper suggested that the measles-mumps-rubella (MMR) vaccine was linked to the development of autism in children. The journal in which the paper was published

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subsequently retracted the article in question, and Wakefield lost his medical license. However, the damage had been done. Wakefield is now an anti-vaccine activist, and many anti-vaxxers still cite Wakefield's paper as a reason not to vaccinate, despite the paper being thoroughly discredited and then retracted. The anti-vaccination movement has only grown since the publication of Wakefield's paper.

Ironically, the success of vaccines has also contributed somewhat to the rise of anti-vaccination sentiment. Vaccines have successfully lowered morbidity and mortality for a variety of once-abundant infectious diseases, so much so that parents are growing complacent (Lynam 2019:104). After all, why would you need to vaccinate your child against polio when polio has been virtually eliminated in many countries? As today's parents were born after widespread vaccination was implemented, they have not had the experience of living through a polio outbreak, a measles epidemic, or a flare-up of mumps. They have not lost friends or family members to vaccine-preventable diseases or observed the potential debilitating lifelong effects of surviving an illness such as polio. As these parents become more complacent, they also run the risk of becoming more distrustful toward vaccines (Lynam 2019:104). As erroneous information about vaccines becomes widely available across social media, even those who are pro-vaccination may become confused or unsure about their choices (Lynam 2019:104). This is a noticeable phenomenon today, with the roll-out of various COVID-19 vaccines, particularly the publicly contentious AstraZeneca vaccine, which was mistakenly thought to be linked to the formation of blood clots (Mahase 2021:1). Although vaccine-hesitancy and vaccine refusal are rapidly becoming global problems, this paper will focus mainly on research and data taken from North America, South America, and Europe.

LITERATURE REVIEW

Key Figures in the Anti-Vaccination Movement

Likely the most important figure in the contemporary anti-vaccination movement is the previously mentioned Andrew Wakefield, the discredited British physician who published an article linking the MMR vaccine and autism in the *Lancet*, an esteemed medical journal (Hotez 2020:505). Despite losing his medical license and having his article retracted due to his flawed and unethical research methods and an undeclared conflict of interest, Wakefield remains extremely popular among anti-vaxxers (Hussain, et al. 2018:2). His theory about the MMR vaccine being linked to autism is still frequently cited by anti-vaccine activists, despite being discredited, and he is often painted as a martyr and a whistle-blower who bravely dared to share the truth and defy the profit-driven medical establishment. Another key figure in the anti-vaccination movement in the United States is Robert F. Kennedy Jr, the nephew of former U.S. president John F. Kennedy. Kennedy runs an organization named Children's Health Defense, and much of his anti-vaccine rhetoric is spread over the social media platform Twitter (Hotez 2020:505). Along with the for-profit organization Stop Mandatory Vaccination, Kennedy's Children's Health Defense is considered one of the most visible anti-vaccine groups in the United States today (Hotez 2020:505). Other celebrities such as Jenny McCarthy, Jim Carrey, and Alicia Silverstone are vocal anti-vaxxers and have helped spread false information about vaccines on social media, using their platform and visibility to reach wider audiences.

Vaccine Opposition as a Civil Right

The anti-vaccination movement is increasingly using "civil liberties" language to frame vaccination as an individual choice, rather than as an important factor for the maintenance of

herd immunity and public health. This idea of vaccination as an individual choice is also tied to neoliberalism¹ and is a very popular argument in the United States, due to that country's strong focus on individual freedoms. This tactic has been shown to produce hesitance and delayed vaccinations even among those who consider themselves pro-vaccine (Broniatowski et al. 2020:317). It has also been suggested that this "civil liberties" framework serves to deflect attention away from the anti-vaccination movement's internal contradictions regarding vaccine safety and conspiracy theories. As the anti-vaccination community is a nebulous group held together only by the belief that vaccines are more harmful than beneficial, there are vastly differing opinions within the group on scientific or medical facts. For instance, some anti-vaxxers believe that vaccines cause the disease they were created to protect against or contain toxic substances, while others believe that vaccines are unnecessary as diseases such as mumps and polio are no longer a threat (Broniatowski et al. 2020:317). Framing vaccine opposition as a civil liberties issue draws attention away from these internal disagreements.

Distrust in Government and Medical Officials

Many anti-vaxxers display a profound distrust of the government, medical personnel, scientists, and "Big Pharma", or the pharmaceutical industry responsible for creating and testing vaccines. The previously mentioned Andrew Wakefield has alluded to the idea that there is collusion between government officials, physicians, and the pharmaceutical industry to conceal the harm vaccines do (Rothstein 2015:12). The idea that physicians promote and administer vaccines not for the good of public health, but to line the pockets of pharmaceutical companies is

¹ Neoliberalism is a contemporary dominant political-economic ideology that supports free-market capitalism, deregulation, and reduction in government spending.

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popular within the anti-vaccination community. Furthermore, government officials and medical personnel may also be perceived as “elitist” and disconnected from caring about the good of the people. Some anti-vaxxers also see physicians as “glorified drug pushers” who are uninformed and reluctant to challenge the status quo (Bradshaw et al. 2020:2061). One recent survey disseminated in the United States found that 56% of American respondents agreed with or felt neutral toward the statement “doctors and government vaccinate children even though they know vaccines cause autism and other disorders” (Featherstone, Bell, and Ruiz 2019:2993). This distrust in public health officials and government agencies is likely why many anti-vaxxers are so willing to share and believe erroneous information gleaned from social media, rather than from more official sources such as government health websites.

METHODS

Primary Sources²

My primary source data was drawn from Facebook pages and Twitter posts, dated from January 1, 2020 to March 2021. In order to filter the data, the keywords vaccine and vaccines were used in the search function on Facebook, and the hashtags #vaccine and #vaccines were used on Twitter. The posts on Twitter were filtered under the “Top posts” section but were discounted if they were posted before January 1, 2020. Any Twitter posts with positive or neutral connotations were ignored, as they were not relevant to the questions of what comprises the anti-vaccine community and how the anti-vaccine community interacts with social media. Comments

² Primary sources refer to first-hand or contemporary accounts of an event or topic. Examples include artifacts, original documents, diaries, manuscripts, autobiographies, interviews, recordings, or social media. They are original sources of information created at the time being study.

on negative posts were also examined. On Facebook, the comment sections on positive or neutral posts or pages were also examined, as many anti-vaccination groups are private and anti-vaccination opinions were visible on public posts. Various keywords or hashtags helped to establish negative connotations within a page or post, including the key words “adverse reactions”, “dumb”, and “experimental”, and the hashtags #DoctorsWhoTellTheTruth, #RevolutionForChoice, and #Dangerous.

Secondary Sources³

This paper focuses much attention on information pulled from secondary sources. Secondary source data was gathered from the literature. This data was mainly gathered from academic articles published within the last five years, maximum within the last ten years. Articles about the anti-vaccination movement, their origins, and their connections to social media were selected as secondary sources. Qualitative content analysis⁴ was used not only to determine how the anti-vaccine movement interacts with and makes use of social media, but also how identity factors into the mix. This paper focuses on studies conducted mainly in North America, South America, and Europe. The United States is the most prominently featured country within the articles chosen for this paper.

³ In contrast to primary sources, secondary sources of information are created later by someone who did not experience or participate first-hand in the topic or event. Secondary sources often draw on primary sources but also involve generalization, analysis, interpretation, or evaluation of that original information. Many scholarly or academic publications are considered secondary sources.

⁴ Qualitative content analysis is a systematic research method used to analyze qualitative data (as opposed to quantitative research) by identifying patterns in written, oral or visual communication, focused on interpreting and understanding the information.

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Case Studies and Findings

The anti-vaccination movement places a focus on individualism, convincing parents that their right to protect their child from the perceived harm of vaccination trumps their duty to support collective public health (Bradshaw et al. 2020:2058). Therefore, the choice to vaccinate is wrested from institutions, whether governmental or medical, and put back into the hands of the individual family. Anti-vaccine theories and false information about vaccines are easily spread over social media, reaching new audiences due to the global prominence of platforms such as Facebook and Twitter. On Twitter, it is estimated that a staggering 50% of Tweets relating to vaccination contain anti-vaccine beliefs (Broniatowski 2018:1378). There are also serious consequences relating to exposure to anti-vaccine material on social media. Exposure to anti-vaccine beliefs has been shown to lead to increased vaccine-hesitancy and delay. Parents who have doubts about vaccination are more likely to search for vaccine-related information online, and the heated debate surrounding vaccination may convince them that there is no scientific consensus on the issue (Broniatowski 2018:1378). In the case of vaccine misinformation spread on Twitter, bots and trolls may also help amplify and spread this misinformation. Bots refer to Twitter accounts which automatically promote content, and trolls refer to individuals who seek to purposefully cause discord on social media (Broniatowski 2018:1378).

Social media platforms serve as more than just a way for anti-vaxxers to spread their beliefs and misinformation. There is also evidence that those people with anti-vaccines beliefs use social media platforms to actively seek out others with similar viewpoints on vaccines and healthcare (Buchanan and Beckett 2014:228). This suggests that anti-vaxxers use social media to create and maintain a sense of community with like-minded others. This anti-vaccine community generates posts on social media which link various health concerns, such as autism, cancer, and even AIDS

to vaccines (Buchanan and Beckett 2014:232). These alarming, alleged linkages serve to frighten parents or anyone else who is on the fence about vaccines. If a parent becomes convinced that having their child vaccinated may lead to the development of cancer or AIDS, they are less likely to follow the recommended vaccine schedule for their child. Anti-vaccine misinformation on Facebook or testimonies from parents of children who experienced adverse reactions to vaccines serve to provoke emotional responses in other Facebook users, leading to anger, fear, and mistrust of vaccines (Buchanan and Beckett 2014:232).

Despite the alarming and rapid growth of the anti-vaccination movement, anti-vaccine Tweets on Twitter have declined in number from 2014 to 2019 (Gunaratne, Coomes, and Haghbayan 2019:4867). Pro-vaccination Tweets far outnumbered anti-vaccination Tweets over a nine-year period from 2010 to 2019, with seasonal spikes in pro-vaccine activity during influenza vaccination campaigns (Gunaratne, Coomes, and Haghbayan 2019:4868). However, a large surge of anti-vaccine activity occurred on Twitter between 2015 and 2016. This increase in activity may have been due to the 2014-2015 measles outbreak, the publication of an anti-vaccine book linked to the anti-vaccine Twitter hashtag #cdcwhistleblower, and the release of Andrew Wakefield's film *Vaxxed*, also linked to a Twitter hashtag, #vaxxed (Gunaratne, Coomes, and Haghbayan 2019:4868). Despite the lower number of anti-vaccine Tweets compared to pro-vaccine Tweets, the anti-vaccination movement has doubled in size from the period of 2016 to 2019 (Gunaratne, Coomes, and Haghbayan 2019:4869). In addition, this data was gathered prior to the 2020 coronavirus pandemic, which may potentially have increased the number of anti-vaccine Tweets, due to the widespread scepticism over the COVID-19 vaccine.

One study carried out on Facebook focused on the comments posted to one 90 second pro-HPV vaccine video released by the Facebook page of a paediatric medical clinic. The aim of this

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study was to gather demographic information on users who posted anti-vaccine comments on the clinic's video. A total of 197 commenters were selected for the study. 86% of these 197 commenters were identified as female (Hoffman et al. 2019:2219). While political affiliation could only be established for 28% of the commenters, the majority identified as supporters of the former American president Donald Trump, followed by those who identified as supporters of the United States Senator Bernie Sanders (Hoffman et al. 2019:2219). Notably, Trump and Sanders represent opposing ends of the political spectrum in the United States. 136 individuals mentioned their location, and the majority of these individuals were located in California, Texas, Australia, and Canada. The most common anti-vaccine themes mentioned were "educational material", "media, censorship, and cover up", and "vaccines cause idiopathic illness" (Hoffman et al. 2019:2219).

Qualitative analysis showed that many of the Facebook users included in the study shared the same anti-vaccination stories, articles and photos taken from Facebook pages marketing themselves as "pro-information", "pro-science", and "pro-vaccine choice" (Hoffman et al. 2019:2219). Despite this marketing, many of the Facebook users included within the study displayed mistrust in medical and government officials. This study demonstrated that social media may be used to bring vastly different people together in the online anti-vaccination movement, as the commenters spanned the political spectrum and were from differing areas across the globe (Hoffman et al. 2019:2219). Despite their political and geographical differences, these commenters had found a sense of community and belonging through using Facebook to connect with others who shared their beliefs.

It is also worrisome that an increasing number of young people have trouble distinguishing between fact and fiction, perhaps due to the sheer amount of news, stories, and statistics they are

inundated with online. A recent study in Brazil found that only 10% of students could differentiate between true and false news (Silva 2021:213). This is concerning, as it leaves students vulnerable to anti-vaccine misinformation spread over social media. In addition, the average amount of time spent online is increasing. In South America, the average daily time spent online is 3 hours and 29 minutes (Silva 2021:213). As age decreases, the amount of time spent online increases, potentially leaving an entire younger generation more susceptible to erroneous vaccine-related information circulating on social media. Furthermore, it is concerning that during the coronavirus pandemic lockdown periods, many people were stuck at home and have been spending much more time online than usual. This factor combined with rising anxiety and skepticism surrounding the COVID-19 vaccines may cause the anti-vaccination movement to grow.

Primary Source Findings from Facebook

While most popular anti-vaccine pages on Facebook are private, many of them boast thousands of followers. In addition, there is significant anti-vaccine activity on public posts created by health organizations. I examined the comments on three different posts by the WHO, CDC, and UNICEF in order to see if there were any common trends among anti-vaccine comments. One video, posted by the World Health Organization (WHO) on February 27, 2021, focused on testing vaccine safety, specifically the safety of the various COVID-19 vaccines that are available. There was an observable theme among the anti-vaccine comments posted to this video. Many commenters expressed doubts that the vaccines were safe due to the speed with which they were created, tested, and marketed. Others were concerned that if they were to suffer side effects from the vaccine, the pharmaceutical company which created the vaccine would not be held accountable (Facebook 2021). This idea plays into the common theme among anti-

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vaxxers that pharmaceutical companies are aware that vaccines are harmful, but market them anyway to create a profit.

On a Centers for Disease Control and Prevention (CDC) post from March 1, 2021, there was also a clear theme among the anti-vaccine comments. The CDC post was an infographic relating to the recommended childhood vaccination schedule, and many of the anti-vaccine comments implied that vaccines are harmful, and that this has been scientifically proven (Facebook 2021). Some comments on the CDC post also insinuated that the pro-vaccine or “forced vax” are part of a cult of “scientism” (Facebook 2021). I was initially unsure of what this term meant. The definition of scientism is “an exaggerated trust in the efficacy of the methods of natural science applied to all areas of investigation (as in philosophy, the social sciences, and the humanities)” (Stenmark 1997:15). These comments seem to imply that those who are pro-vaccine blindly put their trust in medical and governmental officials, despite the “fact” that doctors, governments, pharmaceutical companies, and vaccines are not to be trusted.

The third Facebook post I examined was created by UNICEF on February 27, 2021. The post featured a video about measles and rubella vaccinations for children in Bangladesh. Several comments on this video differed from the ones posted on the CDC and WHO posts. The comments of this video tended to refer to the “evil” of vaccines, referencing religion and morals rather than anti-science viewpoints (Facebook 2021). Interestingly, although this post was primarily focused on measles and rubella vaccines, many comments addressed the coronavirus pandemic and COVID-19 vaccines. However, the focus on religion and the association between vaccines and Satan, or religious evil, is a recognizable theme among anti-vaxxers, although it is less prevalent than themes of vaccine safety or government mistrust.

Primary Source Findings from Twitter

Interestingly, when searching the hashtag #vaccines on Twitter, there is a notice at the top of the results page directing the user to the Public Health Agency of Canada. This suggests that Twitter does take the problem of rampant false anti-vaccine claims made on the platform seriously. There are numerous recent and popular anti-vaccine Tweets on Twitter from Robert F. Kennedy Jr.'s account. These Tweets themselves tend to focus on the safety of vaccines and the trustworthiness, or lack of, of pharmaceutical companies. However, among the replies to Kennedy Jr.'s Tweets, there is noticeable conspiracy thinking in association to vaccines. In response to a Tweet posted on February 23, 2021, one commenter speculated that the COVID-19 vaccine is either a placebo or will cause a "mass extinction event" while being knowingly administered to the American population by the government (Twitter 2021). Another commenter compared physicians who recommend the COVID-19 vaccine to pregnant women to the infamous German concentration camp doctor Josef Mengele, and in another comment trusting physicians over one's own observations was compared to "unscientific slavery" (Twitter 2021). In general, the anti-vaccine rhetoric under Kennedy Jr.'s Tweet is more politically-charged and more offensive than that on Facebook. Extreme anger, antisemitism, and conspiracy thinking are all easily found in the comments posted to a single Tweet from Kennedy Jr.

Another extremely popular anti-vaccine figure on Twitter is Del Bigtree, a film and television producer who describes himself as a "medical producer" despite having no medical training. Many of the Tweets on Bigtree's Twitter account give the impression that he is an expert exposing the truth about vaccines, and he uses false scientific information to back his claims (Twitter 2021). This portrayal leads to the impression that Bigtree can be trusted and listened to on the topic of vaccines. At the same time, Bigtree uses phrases such as "be brave" in his

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Tweets, encouraging Twitter users to watch his videos and uncover the “truth” about vaccines, sucking them deeper into anti-vaccine conspiracies. Throughout Bigtree’s Tweets, there is a common theme of using language that gives the impression that he is a trustworthy, truthful authority on vaccines, while simultaneously insinuating that anyone who does not believe his claims is unintelligent. Interestingly, Bigtree also Tweets about other conspiracy theories and is politically conservative. Suggestions have been made in the literature that there is a tentative link between conservative or Republican politics and conspiracy thinking (van der Linden et al. 2021:25; Nera et al. 2021:742), but I want to note that I certainly do not believe that all conservatives are conspiracy theorists, nor are they all anti-vaxxers.

There is also significant anti-vaccine activity perpetuated by bots and trolls on Twitter. Several Tweets declared that vaccines lead to genocide and that the process of vaccination was tyrannical. These troll accounts also tended to make politically charged, incendiary posts and are heavily involved in other popular conspiracy theories, such as the QAnon conspiracy theory and Donald Trump’s unsubstantiated fraud claims about the 2020 American election. While these Tweets tended to be from smaller accounts with less of a platform than large, popular accounts such as Robert F. Kennedy Jr.’s or Del Bigtree’s, they would post frequently, most of them posting multiple times a day or even multiple times an hour. The sheer number of daily anti-vaccine Tweets originating from bot or troll accounts could potentially influence other Twitter users to dig more deeply into anti-vaccine claims and beliefs.

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ANAYLSIS

Association with Gender and Parenthood

While several prominent members of the anti-vaccination movement, such as Andrew Wakefield and Robert F. Kennedy Jr. are male, most studies place an increased focus on the women involved in anti-vaccine communities. There has been a push within the anti-vaccine movement for women to trust their “maternal instincts”, even when these instincts are in direct opposition with expert medical advice (Bradshaw et al. 2020:2062). Furthermore, healthy children are seen as a physical representation of good mothering, leading mothers to place greater importance on their own children’s individual health rather than the health of all children as a group (Reich 2014:682). This focus on women knowing what is best for their children health-wise is a prominent theme on “mommy blogs”, online blogging platforms focused on parenting. An examination of the top 25 most popular parenting blogs from the period between 2006 and 2015 showed that 52% of posts coming from these blogs were “strongly vaccine-discouraging” (Meleo-Erwin et al. 2017:1895). The prevailing themes regarding vaccines on these blogs included the belief that parents who choose not to vaccinate their children have made responsible and informed decisions, a suspicion of doctors and modern medicine, the belief that vaccines contain toxic chemicals, and the belief that vaccines are harmful to children (Meleo-Erwin et al. 2017:1897).

Discussion

Unfortunately, Twitter and Facebook are breeding grounds for the spread of anti-vaccination beliefs. While anti-vaxxers are generally portrayed as people who have bought into Andrew Wakefield’s discredited study linking vaccines to autism, their worries and beliefs are actually

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much more diverse. The main concerns held by anti-vaxxers tend to involve vaccine safety, mistrust of the government, or worries about personal liberty and freedom, but anti-vaccine posts on Twitter and Facebook also tend to feed into conspiracy theories. Conservatives may accept conspiracy theories and anti-vaccination beliefs more easily, as they rely more on social media for medical information, and less so on authoritative medical websites (Featherstone, Bell, and Ruiz 2019:2996). Social media allows the anti-vaccine movement to spread their false beliefs quickly and efficiently, and to respond aggressively when their false beliefs are countered (Featherstone, Bell, and Ruiz 2019:2996).

The anti-vaccination community may also play on individuals' senses of identity as parents or as women in order to reel them in to the movement. Throughout the 1960s, '70s and '80s, ensuring that children were vaccinated was seen as a mother's duty. Mothers who failed to have their children vaccinated, whether due to poverty or other factors, were chastised by doctors and other health officials (Conis 2013:411). However, the second-wave feminism movement which began to emerge in the 1960s sought to put women's health issues back into women's hands, rather than advising women to blindly trust the often-paternalistic, male-dominated medical establishment (Conis 2013:418). While certainly not all second-wave feminists distrusted physicians, there was a growing belief that male physicians did not take women's health concerns seriously, withheld knowledge or lied to them, and even performed unnecessary medical procedures. These were fair concerns at the time and still hold merit in the current day, but unfortunately, these fears led to some undesirable results. By the end of the 1970s, this attitude of mistrust had spread toward vaccines (Conis 2013:419). While these feelings were originally expressed through books and films, anti-vaccine posts targeted specifically toward

women and mothers are now commonly found across social media, particularly on “mommy blogs”.

Relevance

It is more important than ever for anthropologists to study and make an effort to understand the motivations of the anti-vaccination movement. The anti-vaccine movement has only grown over time, and their use of social media allows them to connect with other like-minded individuals and disseminate their beliefs mostly unchecked. In general, more time is being spent online, and the amount of time spent online may be increased further due to lockdowns caused by the COVID-19 pandemic. As previously mentioned, vaccine-hesitancy or refusal is a significant problem and has led to outbreaks of several vaccine-preventable diseases in recent years. In addition, vaccines are needed to allow us to return to living life as before COVID. If herd immunity cannot be achieved against COVID-19, the coronavirus will continue to ravage elderly populations and disrupt everyday life. Coronavirus mutations are also increasingly posing a growing risk to younger age groups. However, concerns and skepticism surrounding the COVID-19 vaccines may hamper efforts to achieve this herd immunity. That is why it is so vital for anthropologists to attempt to understand the anti-vaccine movement and suggest ways to effectively counter the spread of misinformation.

Limitations and Future Research

While this paper offers a broad look at how the anti-vaccine movement interacts with Facebook and Twitter, and how identity and anti-vaccine beliefs may be linked, there are several limitations to be considered. First, this paper focuses on Twitter and Facebook, and does not take into account anti-vaccine activity on other popular forms of social media, such as Instagram,

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YouTube, or TikTok. Anti-vaccine videos posted to YouTube or TikTok may be especially problematic given the algorithms used by these platforms, which suggest similar material to the videos one has already watched. The posts and comments that I examined on Twitter and Facebook were also new, having been posted after January 1, 2020. These posts could potentially have been influenced by the political climate at the time they were posted, and they may also have been affected by the current global situation created by the ongoing COVID-19 pandemic. The posts I examined were also all written in English, which may obscure the role of the anti-vaccine movement in non-English speaking online communities. In addition, the paper is focused mainly on countries in North America, South America, and Europe. However, the anti-vaccine movement also affects the continents of Africa, Asia, and Oceania. In the future, research into the anti-vaccine movement and their relation to other social media platforms, languages, and continents or countries may be revealing and useful.

CONCLUSION

The anti-vaccination movement is a loosely connected group of people who oppose mandatory vaccines, or otherwise believe that the harm of vaccines outweighs their benefits. Unfortunately, a drop in levels of vaccinations has led to several outbreaks of vaccine-preventable diseases within the last decade, and vaccine-hesitancy is considered one of the most pressing threats to global health in the 21st century. Social media platforms such as Twitter and Facebook allow members of the anti-vaccination movement to interact with each other with ease and share content which may encourage others to refuse vaccines as well. The anti-vaccination movement may also play upon aspects of identity, such as political orientation, parenthood, or gender, to attract new believers. It is important to address the anti-vaccine movement and their beliefs to encourage those who are seeking information about vaccines to speak with trusted

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professionals rather than turning to Facebook or Twitter, where misinformation and conspiracy theories abound. This is particularly important given the need to achieve herd immunity in the face of the ongoing COVID-19 pandemic, and to reduce any future outbreaks of vaccine-preventable diseases. Future research is needed to create a deeper understanding of the evolving way that the anti-vaccination movement engages with social media, and to develop ways of addressing the growing problem of vaccine-hesitancy and rejection.

ACKNOWLEDGMENTS

Before beginning my acknowledgements, I would like to recognize that I live, learn, and work on the traditional unceded territory of the Lheidli T'enneh, for which I am deeply grateful. I would like to thank my professors in the Anthropology department at the University of Northern British Columbia, particularly Dr. Angèle Smith and Dr. Lianne Tripp, for their support, guidance, and inspiration for this paper. I would also like to thank my parents, Dr. Pierre Ducharme and Allison Haley, and my siblings, Catriona and Noé Ducharme, for sitting down with me and discussing vaccines and their benefits and drawbacks, as well as the cultural factors contributing to vaccine-hesitancy. Finally, I would like to extend my sincere thanks to my peer reviewer, Kamrin McCain, for her valuable advice and comments.

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