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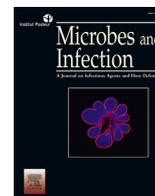
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Original article

Digging the rabbit hole, COVID-19 edition: anti-vaccine themes and the discourse around COVID-19

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ABSTRACT

This article draws on a broadcast popular among the anti-vaccine community to map out six themes used by the broadcast to mislead viewers about COVID-19. The themes are the claim that “they” – government and pharma – are lying to you, claims that COVID-19 is an excuse to remove civil liberties, viewing everyone as an expert, claiming that science cannot save us, skewing the science, and a claim that “they” are out to harm the viewers. The article points out that similar themes are used to mislead followers with anti-vaccine information. It highlights the concern that these themes will not only mislead people who are already anti-vaccine about the pandemic, but may draw in people who are not anti-vaccine but are seeking information about COVID-19, and suggests some options for dealing with the misinformation. Scientists benefit from understanding these claims, as we are often tasked with providing rebuttals to this misinformation.

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1. Background and introduction

The COVID-19 pandemic changed much about the world, but not the fact that anti-vaccine groups – organizations whose world is built around a deep belief that vaccines are very harmful – operate within an alternate reality [1]. The anti-vaccine world is characterized by deep mistrust of government, and a set of “alternative facts” – incorrect views about reality – held by people in the movement. The anti-vaccine alternative reality lends itself easily to negative claims about COVID-19 (see Table 1).

Though the specific claims of different forms of science denial are unique to each niche, the overall playbook is very similar, regardless of the topic. Whether it is skepticism of climate change, HIV/AIDS [2], evolutionary biology [3], or vaccines [4], similar themes repeatedly emerge. COVID-19 denial is the latest iteration of this mistrust, but has developed exceedingly rapidly and has potential to do an enormous amount of harm in a short period of time.

In this paper, we examined COVID-19 related claims from a popular anti-vaccine broadcast, and drew out major themes in the discussion. We examined how these themes mislead people, and

explained similarities between these themes and anti-vaccine misinformation more broadly. These themes can appeal to people from different walks of life, especially during times of crisis, and can pull them into the world of health misinformation.

2. Methodology

We watched the episodes of the show *The Highwire with Del Bigtree*, a popular weekly anti-vaccine broadcast, from January 30, 2020 to April 2, 2020, taking detailed notes (while we continued watching the show since, we did not continue taking detailed notes). Each of us independently wrote out themes from the show. Then we discussed our findings and converged on six common themes.

3. Results

We have identified six key themes that characterize the coverage of COVID-19 on *The Highwire with Del Bigtree*, themes equivalent to those used in promotion of anti-vaccine claims. First, a major thread running through the show was the claim that “government and the media are lying to you.” A sub-theme to this is that this is motivated by money, often linked to “big pharma.” There are many examples of this; on January 30, Bigtree said that “CDC and FDA really like to hide facts.” On March 19, Bigtree claimed the

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Table 1
Themes from The Highwire with anti-vaccine comparison.

Theme	Description	Anti-Vaccine Equivalent
1. “They” are lying to you	The government, “Big Pharma,” and other entities are hiding the truth about COVID-19 cases and fatalities from the general public; suggestion that disease is more mild than reported.	The government, “Big Pharma,” and other entities are hiding the truth about vaccine injuries and deaths from the general public.
2. Civil liberties	Government has no right to impose stay-at-home orders; quarantine is worse than the disease.	“My child, my choice;” argues that parents should be the sole arbiter of vaccine uptake and vaccine mandates should be removed.
3. Everyone is an expert	Belief that developing scientific expertise is not difficult nor need to be specialized.	Parents know their children best; parents are experts on children.
4. Science won’t save us (nature is better)	Promotion of herd immunity for SARS-CoV-2 infections.	Promotion of “natural” infection in place of vaccination.
5. Skew the science	Cherry-pick experts who are outside of the mainstream to suggest particular areas of COVID-19 epidemiology are more controversial than they appear.	Cherry-pick experts who are outside of the mainstream to suggest vaccinations are more dangerous than mainstream science accepts.
6. “They” are out to harm you	The government and “Big Pharma” want to use COVID-19 to depopulate the globe and inject the population with tracking devices.	The government and “Big Pharma” want to use vaccines to depopulate the globe and inject the population with tracking devices.

numbers of deaths and cases reported out of China were false, and on March 26, he claimed that the Italian cases and deaths were misrepresented, and that the numbers in the United States were also misrepresented, alleging that in both cases only 12% of the reported number died of the virus. This draws on a Telegraph article published several days earlier, explaining that 88% of the deaths had additional comorbidities, which may have contributed to the deaths [5]. Bigtree described the article – incorrectly – thus: “88% of the cases you have to admit died from something else but they leave the 7000 number to scare us.”

On March 26, Bigtree argued that there’s a “global agenda” motivated by money – and led by Dr. Fauci – to bring a vaccine that will be forced on everyone in the world. This idea has gained considerable traction among anti-vaccine advocates; the hashtag #firefauci trended on Twitter in April and President Trump suggested firing Fauci again in November.

Similar themes are often part of the anti-vaccine narrative. In testimony before the Washington state Senate, Del Bigtree accused the CDC of fraud – a theme echoed in the anti-vaccine movie he produced, *Vaxxed* [6]. The same theme characterized the anti-vaccine description of a freedom of information act (FOIA) settlement with Health and Human Services (HHS) [7].

A second theme casts doubt on the ability of science to handle problems. Maybe the most blatant example is when, during his January 30 show, Bigtree brought in a sack of rice to try and claim that scientists’ concern about specific viruses is irrational because there are millions of viruses and bacteria (symbolized by the grain of rice). Bigtree described the quest to find vaccines against specific germs as “stupid” and asked, “At what point do we say this is futile?”

While it is true that there is an enormous diversity of bacteria and viruses, only a small percentage cause us harm, and most of those have a vaccine or treatment (such as antibiotics) available; thus the analogy fails.

The same theme appeared in other shows – for example, on March 19 he argued that we should just use natural selection like caribou—“sick get eaten by the wolves. That’s how we’ve thrived.” Along similar lines, Bigtree claimed on March 26 that immunity from getting a virus is lifelong and superior to vaccine immunity – it’s “something never achieved by a vaccine, it’s an inferior immunity vaccines provide.”

A third theme emphasizes that government’s reaction to COVID-19 tramples civil liberties. The discussion of this started to increase in earnest after multiple states issued stay-at-home orders (starting with six counties in California, on March 15 [8]). On March 19, Mr.

Bigtree asked “How many people are willing to sacrifice their health (including financial) to protect the vulnerable?” On March 26, he described the measures to contain spread as “government moving in on civil liberties.” On April 2, he asked “why are we locked down now?” This theme echoes claim of anti-vaccine activists that they are “the new civil rights movement” [9].

A fourth theme to emerge tells listeners that they are just as expert as everyone else, so they should “think for themselves”. In her book *Calling the Shots* [10], Jennifer Reich described how anti-vaccine parents saw themselves as experts equivalent to scientists, and in some ways, better. Similarly, Bigtree argues that he – and his audience – are as qualified as the experts. In part, he does it by attacking experts. For example, in January 30 he described CDC and scientists as “a bunch of morons”. On March 26, Bigtree said that “if they are ... removing whatever lockdown they had it really sort of defies to me any idea that this was an infectious disease ... it just defies reason doesn’t it?” On April 9, in response to alleged new discoveries on how to treat patients, Bigtree asked, “What took so long? ... This is why people, we trust our doctor – aren’t they all sitting together and talking about differences? What’s wrong with medicine that it’s taking so long?” Bigtree both does not respect expertise, and sees experts as not doing their job, ignoring that in a new situation, new information comes up, and knowledge has to develop. This may echo a common misunderstanding of the scientific process, which is, in reality, often messy, involving starts and wrong ends, but eventually – ideally fast, but not always – converging on conclusions supported by evidence drawn from multiple independent sources.

While he criticizes many of the mainstream experts, in the fifth theme we identified, Bigtree is skewing the science [1]. In her article on tactics and tropes of the antivaccine movement, anthropologist Anna Kata described how anti-vaccine activists skew the science by rejecting studies that did not fit their views by latching onto studies and experts that support them. Bigtree consistently picks experts and data he likes rather than looking at a full picture. For example, on January 30 he brought in a scientist without expertise in virology or epidemiology – James Lyons Weiler – to talk to the origins of coronavirus, followed by a doctor sympathetic to the anti-vaccine cause, David Brownstein. On March 26, Bigtree quoted several experts in various fields who agreed with his views that governments overreact to COVID19 – ignoring the many experts who disagree. Similarly, he described the limited evidence behind treating COVID19 patients with hydroxychloroquine as clearly supporting recommending it [11], ignoring issues, and said “Why attack the only option you have?”

On April 9 Bigtree brought in bioinformatics scientist Knut Wittkowski (who claimed, among other things, that deaths in the United States won't surpass 24,000; as of October 20 the United States saw over 220,000 confirmed COVID-19 fatalities). Wittkowski is not an infectious diseases expert, as demonstrated in a highly-publicized interview where he declared the pandemic "over" and claimed he didn't understand why we were trying to "flatten the curve" [12]. The claim of inflated death numbers was repeated on April 30, when he interviewed two doctors who own a chain of urgent care centers and who claimed that the death rate of the disease was very low – claims so misleading that the American College of Emergency Physicians (ACEP) and American Academy of Emergency Medicine (AAEM) issued a joint statement condemning these doctors' "reckless and untested musings" [13].

As a final theme, the broadcast strongly suggests that "they" (government, evil actors motivated by pharma) are out to get you" – they're not just hiding information, they're intentionally harming you. On March 19 Bigtree strongly criticized the harms of quarantine – "quarantine is not a safe approach. It is a deadly one;" that presents "grave risk to the destruction of our economy." While it is certainly true that stay-at-home orders had a detrimental economic effect, economists have noted that a lack of them would also have been devastating, and would have come with a higher death rate [14]. On March 26, Bigtree suggested that if we quarantine for COVID-19, we will need to do this for every influenza season as well going forward, implying that the government will continue this "over-reach" of powers to protect individuals from infection. Similar themes are common in the anti-vaccine movement – for example, Larry Cook, an anti-vaccine activist, put out an ad claiming vaccines kill children, and Del Bigtree made similar claims on previous shows [15].

4. Discussion

In this paper, we studied the broadcast of COVID-19-related misinformation by a popular anti-vaccine broadcast, and drew out major themes in the discussion. We explained the similarities between these themes and anti-vaccine misinformation generally. These themes can appeal to people from different walks of life, and can pull people into the alternative world of health misinformation, especially during times of crisis. Scientists and physicians should be cognizant of these misleading claims and their origins, as we collectively are often asked to respond to them.

Indeed, one concern we see is that the thirst for information during the COVID-19 pandemic, and the high stress level it involves, would pull people who were not previously part of the anti-vaccine alternative reality into it. We have seen growth in the numbers of viewers of Highwire – though that needs to be approached with caution. Before January 30, some shows from previous years had over one million viewers, but in the leadup to that date – where COVID-19 coverage started – few broke the 100,000 barrier. Shows since have doubled or tripled that number – still a small number compared to Alex Jones or Fox News, but a rise nonetheless and a substantial one for what is, in reality, a small and extreme movement.

Bigtree's reach and creation of an echo chamber among Highwire watchers is concerning. Other studies examining social media consumption and vaccine attitudes have found that it generally takes only a small amount of exposure to anti-vaccination attitudes on social media to influence an individual's attitudes about vaccination. A prior study examining Twitter users exposed to negative opinions regarding the human papillomavirus (HPV) vaccine found that these users were more likely to tweet negative misinformation

about the vaccine, including outright misinformation [16]. Another study examining long-term Facebook users found that polarization regarding vaccine positions increased over time [17], as users found online "echo chambers" that agreed with their vaccine stance. Further, those exposed to antivaccine misinformation on social media were more likely to be misinformed by it than those exposed via traditional media sources [18].

While research into COVID-19 misinformation is only beginning, we anticipate that many of these exposures via social media will hold true for COVID-19 as they do for vaccination. Social media companies should be more proactive in identifying and potentially removing COVID-19 misinformation. Public health communicators need to use best practices both to provide accurate messaging and to respond to and correct misinformation. That latter response should use the approach of a truth sandwich [19] – open with the facts, address the misinformation without repeating it more than necessary, and end with the truth again.

COVID-19 presents challenges and risks, but also an opportunity. If we can do a good job exposing the tactics and misinformation used to mislead people on COVID-19, we may better arm people and prepare them to resist misinformation in other contexts.

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Declaration of competing interest

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DRR: Dorit Reiss' family owns some regular stock in GSK.

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