

# The Erosion of American Faith in Science: Implications for COVID-19 Vaccination Efforts

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## Abstract

As the prospect of a viable COVID-19 vaccine becomes imminent, many are concerned that large swaths of the American public will opt out of being vaccinated. Whether it be due to their anti-vaccination beliefs or their concern regarding the speed and efficacy of its development, steps must be taken to improve Americans' confidence and likelihood to get vaccinated. If measures are not taken, and many Americans chose not to get vaccinated, the development of a vaccine may be moot.

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Upwards of 250,000 Americans have lost their lives to COVID-19, the disease caused by SARS-CoV-2. Over the past several months, nations have struggled to contain the virus, using a variety of strategies to treat the infected and limit the disease's spread. The most successful nations acted quickly, implementing mask orders, quarantines, and social distancing to limit transition. Others, such as the US, struggled to develop a coordinated response. Instead, many pinned their hopes on the development of a vaccine. In theory, a vaccine would render those difficult measures unnecessary. However, that only works if citizens get the vaccine. Due to the anti-vaccination movement, America faces a reality where citizens may actively decline the opportunity to get

vaccinated, in effect making the development of a COVID-19 vaccine moot.

The anti-vaccination movement isn't new in America, in fact, it's been present since smallpox inoculation began in the 18th century (Hotez, 2020). Those individuals, who have come to be known as anti-vaxxers, argued that compulsory vaccination was an infringement on their civil liberties and freedoms, notions that remain important to some in the 21st century. However, most followers of the modern-day anti-vax movement aren't concerned with a violation of their rights, but instead the safety and efficacy of the treatment. While a variety of factors have led to this suspicion, the seminal event can be traced to the publication of a 1998 Lancet article that argued that vaccines cause autism (Kata, 2010). While this article has been proven inaccurate many times over,

it laid the groundwork for a distrust in vaccines that has grown over the past 20 - 30 years (Haerlin and Parr, 1999). Anti-vaxxers have cited that article when questioning the safety of vaccinations, and the potential for a conspiracy behind their motivation (Kata, 2010). This has fostered further distrust in scientific research and in healthcare experts themselves.

Although researchers have long believed that increased accessibility to information would allow for dissemination of accurate knowledge, what recent studies have shown is that the internet has only helped solidify falsehoods (Johnson, Velásquez, and Restrepo, 2020). Instead of using it to compare information and think critically about an argument, it has exacerbated tribalism and further reinforced beliefs people already hold. This is done actively, by seeking out likeminded individuals and passively, by social media algorithms that are designed to select content that appeals to user tendencies. Studies have shown that such echo chambers further reinforce individual's beliefs (Ohme, 2020). This tunnel vision predisposes individuals to reject peer-reviewed evidence in favor of emotive appeals leveraging "us vs them" arguments. Furthermore, it has provided a platform for others to share their views, even if they have no expertise in the topic. In doing so, the internet has made everyone an expert and reduced the voices of the true authorities.

In 2020, this is a very big problem. While previous anti-vaccination campaigns have led to flare-ups of vaccine preventable

diseases, such as the 2019 measles outbreak in Brooklyn, those have been mostly contained to small geographic areas. We have never faced a scenario where the anti-vaccination movement has been pitted against a pandemic of this magnitude. It has led to the creation of new conspiracy theories, such as the idea that Bill Gates created COVID-19 so that governments would institute mandatory vaccinations or that the 5G cell network led to the immunocompromising of the public (Hotez, 2020). Ultimately, we've seen the anti-vaccine movement return to its roots and solidify its position under the guise of choice and health freedom. In doing so, they have aligned with anti-maskers and anti-social distancers. While it's true that the constitution bestows a certain set of unalienable rights, it's difficult to rationalize how wearing a piece of cloth over one's face is a serious impingement on one's freedom. Setting aside the argument that the government already imposes restrictions to protect the health and safety of its citizens, e.g. seatbelt mandates, wouldn't it be in one's interest to do something that has been proven to be beneficial for both themselves and those around them? In reality, the anti-mask movement doesn't reflect a defense against a tyrannical government, but instead the politicization of the virus. Whether it be conscious or not, like the anti-vax rationale following the Lancet article, anti-maskers have seized on the "us vs them" mentality to defy tenets of empathy and altruism. Looking forward, if we use mask wearing as an imperfect proxy, one can hypothesize that there will be large swaths of

Americans that adopt similar thinking and actively choose not to get vaccinated.

But making that assumption overlooks some valid concerns citizens may have. Overall, the US government's response to the pandemic has been unorganized at best. Local, state, and federal officials have often contradicted each other, leaving the public without a reliable source of information. Furthermore, President Trump's laissez faire approach has led many to scoff at the seriousness of the situation. Even though he has repeatedly supported a vaccine, downplaying the virus has rightfully led many citizens to question the government's plan to develop one (Hotez, 2020). Although the government's financial pledge to provide a cheap vaccine has reassured some, questions regarding efficacy and safety still abound (Roose, 2020). Operation Warp Speed was meant to symbolize the speed at which the private-public partnership would develop a vaccine, but more often than not, it has called into question the safety of rushing through an approval process that normally takes years. Furthermore, revelations that political appointees at HHS tried to downplay CDC reporting has added to concern that an unsafe vaccine may be pushed through for political reasons. Finally, some groups that have been historically disenfranchised by medicine in the past, such as the impact of the Tuskegee Syphilis experiment on Black Americans, may have a long-standing mistrust in government administered vaccinations (Santoli et al 2020). It's apparent that hesitancy surrounding a

COVID-19 vaccine extends beyond the typical anti-vaccination groups.

So, once it's available, how do we convince Americans to get vaccinated? Maximizing this number led a group of epidemiologists, headed by those at Johns Hopkins and Texas State University, to pen a working paper to address this very question (Schoch-Spana et al., 2020). Ultimately, the paper outlined five key steps that the government could undertake to increase acceptance and eventual inoculation of a future COVID-19 vaccine. These steps focused on grassroots efforts to better understand communities' concerns, earning the public's confidence that the vaccine is safe and efficacious, increasing access to vaccinations, minimizing disinformation, and establishing apolitical local, state, and federal bodies that instill public ownership of the process. The authors argued that a unified, cohesive, and factual message would be most effective at increasing vaccination rates (Schoch-Spana, Brunson, Long, Ravi, Ruth, and Trotochaud, 2020).

While I agree with their recommendations and believe that such actions will be very effective at convincing those who may rightfully be weary of the vaccine, I believe additional steps must be taken to address the rest of the anti-vaccination community. Studies have shown, simply providing accurate information about the efficacy and safety of vaccines won't convince anti-vaxxers that their beliefs are false (Kata, 2020). In fact, simply providing information that contradicts their already held beliefs (even if their beliefs are

inaccurate) will only further entrench them. In order to understand this, we have to acknowledge that more often than not, their views toward vaccinations are intertwined with other aspects of their lives (Johnson et al 2020). A review of anti-vax Facebook groups showed that the community outnumbers pro-vaxxers three to one (Johnson et al 2020). In fact, not only are there more of them, but there is heterogeneity among their groups. Where one page preaches holistic remedies perhaps better suited for a liberally minded demographic, another argues for libertarian views. These pages attract very different people, however in both cases, they are anti-vax. Coupling anti-vax beliefs to other aspects of their lives means that any contradiction or belittling of those beliefs will likely be felt as a denigration of their self.

In order to successfully “educate” anti-vaxxers, we need to take this nuance into account. With this in mind, I would like to see the government work directly with the scientific community and public health entities to design programs that meet anti-vaxxers halfway on the debate. Only by empathizing with their beliefs, no matter how conspiratorial, will we have the opportunity to convince them of the truth regarding vaccines. I believe that extending an olive branch will be the most effective way at achieving the ultimate goal of sufficient vaccinations to achieve herd immunity.

Although this accounts for citizens with valid scientific concerns, this excludes those whose actions may be politically motivated. The President-Elect has outlined a

comprehensive plan for handling the COVID-19 crisis, centered around an organized national response. Depending on the rate of infection, this may even include a return to reduced mobility and/or a mask mandate. Although that will likely only exacerbate tensions, his campaign was centered on the notion of uniting America, and his Administration will need to do just that in order to depoliticize the vaccine. Ultimately, unless a plan is executed that builds trust in COVID-19 vaccination amongst anti-vaccination individuals and efficacy/safety skeptics alike, the vaccine will not be the silver bullet so many are hoping for to end this pandemic.

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