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Anatomy of a Conspiracy Theory: Law, Politics, and Science Denialism in the Era of COVID-19

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ANATOMY OF A CONSPIRACY THEORY: LAW, POLITICS, AND SCIENCE DENIALISM IN THE ERA OF COVID-19

by: Brie D. Sherwin*

ABSTRACT

With COVID-19, we are facing the most serious public health threat of our lifetime. Now, more than ever, we need experts and sound scientific advice to guide critical decision-making during the pandemic. With conspiracy theories and other similar rhetorical weapons being used to discredit our scientific experts, we face a myriad of misinformation, mistruths, and all-out attacks on our experts, breeding distrust between the public and the policymakers leading the fight against the pandemic. As President Trump took office, scientists were routinely denigrated and isolated. Furthermore, science denialism has permeated its way up to the highest levels of government, resulting in disastrous public policy decisions that have been detrimental to environmental and public health. Funding was cut for much-needed research on zoonotic-borne diseases, the U.S. government pulled its support from the Paris Climate Agreement in 2017, and well-respected scientists were removed from various advisory roles in agencies. Until the COVID-19 pandemic, many of these decisions went unnoticed by the general public. But, in courtrooms over the past thirty years, judges have recognized the danger of fake experts and acted as gatekeepers to ensure that experts are credible and that science is reliable. The use of Daubert in the courtroom has provided judges with a tool for allowing expert testimony that has met certain indicia of reliability, so jurors can focus on making factual determinations instead of judging whether the sources of the expertise should be trusted. Without a similar gatekeeping function in society, citizens must make those determinations on their own. Scientists and advocates of science should employ their own rhetorical methods to restore the credibility and importance of science in protecting our environment and now our health. Change can only truly come from the ground up. Citizens must actually believe that the climate is changing; they must believe that the health advice they are receiving from public health experts is accurate and trustworthy enough to follow. It is time to put science first—we can only do that if we stop science denialism in its tracks and restore resources and trust in our scientific community.

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I. INTRODUCTION

“What worries me the most is that we are going to miss the next emerging disease; that we are going to suddenly find a SARS virus that moves from one part of the planet to another, wiping out people as it moves along.”

— Dr. Peter Daszak in 2003. Dr. Daszak is a British zoologist, whose National Institutes of Health (“NIH”)-funded coronavirus grant was canceled in 2020,¹ shortly after a Newsmax reporter who, in a question to then-President Trump, misleadingly claimed that a majority of his grant funding went directly to the Wuhan lab.²

“Everyone is lying. The CDC, Media, Democrats, our Doctors, not all but most ,that [sic] we are told to trust. I think it’s all about the election and keeping the economy from coming back, which is about the election. I’m sick of it.”

— Then-President Trump retweeting game show host Chuck Woolery’s July 13, 2020, tweet.³

There is nothing like a true crisis to expose just how much the executive and legislative branches have hollowed out the presence of scientific expertise in the U.S. government over the past few years.⁴ As

1. 60 Minutes (@60Minutes), TWITTER (May 10, 2020, 6:07 PM), <https://twitter.com/60Minutes/status/1259621162163855361> [<https://perma.cc/46NK-8D43>].

2. Aaron Blake, *How Misinformation, Filtered Through Fox and Conservative Media, Quickly Became Trump Administration Policy*, WASH. POST (May 11, 2020, 2:11 PM), <https://www.washingtonpost.com/politics/2020/05/11/how-misinformation-filtered-through-fox-news-conservative-media-became-trump-administration-policy/> [<https://perma.cc/LB7Q-HJ8P>]. On Fox News, Tucker Carlson and Lou Dobbs discussed the premise that the full \$3.7 million went to the lab. *Id.* “Despite those warnings,” Lou Dobs said, “the U.S. National Institutes of Health awarded a nearly \$4 million grant to the Wuhan lab studying the virus. What were they thinking?” *Id.* (internal quotations omitted). The same day, Carlson hosted Representative Matt Gaetz (R-Fla.), “who repeated the incorrect claim that the \$3.7 million went to the Wuhan lab.” *Id.* Later, another conservative media outlet, Newsmax, reported this false premise in a question to Trump at the White House coronavirus task force briefing: “There’s also another report that the NIH, under the Obama administration, in 2015 gave that lab \$3.7 million in a grant . . . Why would the U.S. give a grant like that to China?” *Id.* President Trump responded, “We will end that grant very quickly.” *Id.*

3. Chuck Woolery (@chuckwoolery), TWITTER (July 12, 2020, 9:17 PM), <https://twitter.com/chuckwoolery/status/1282499347117215745> [<https://perma.cc/5GDB-NZNL>]; Quint Forgey, *‘Everyone Is Lying’: Trump Undercuts Public Health Officials in Fresh Attacks*, POLITICO, <https://www.politico.com/news/2020/07/13/trump-questions-public-health-experts-twitter-359388> (July 13, 2020, 3:25 PM) [<https://perma.cc/CW2X-7DKV>].

4. Dan Balz, *Crisis Exposes How America Has Hollowed Out Its Government*, WASH. POST (May 16, 2020), https://www.washingtonpost.com/graphics/2020/politics/government-hollowed-out-weaknesses/?itidHP_hp-banner-main_reckoning-in-com412pm%3Ahomepage%2Fstory-ans [<https://perma.cc/G7HH-B3NG>].

COVID-19 took hold of the country, various government officials seemed to be caught unaware, and as the shock settled and the country began to struggle, those officials did little to ramp up the necessary testing and tracking required to achieve some level of containment.⁵ Whether the delay was due to a lack of a scientific presence or agency mishaps, many of the government's messages have been either strictly contrary to what our top scientists are advising or are meant to denigrate their expertise.⁶

Throughout its tenure, the Trump administration continually questioned widely accepted scientific methodologies and truths in an effort to reduce and undermine the use of such information.⁷ In fact, the Trump administration, more than others, promoted a "war on science" by employing rhetorical tactics that science denialists have commonly employed over the past several decades.⁸ Conspiracy theories and science denialism are nothing new and have existed for centuries. But this time, it is different. The internet, social media, and conservative news outlets are spinning tales that are affecting public health policy at the highest levels, pushing out the scientists and leaving the public even more confused and anxious. This is occurring while the science behind the pandemic is unfolding in real time—data, observations, and experiments are on stage for the public to see, leading those with political objectives to capitalize on the uncertainty by proclaiming that scientists do not know what they are talking about.⁹ Trust in science can be restored, but only by calling out the rhetorical tactics used by science denialists, while advocating for a data-and-expert-driven approach to policy.¹⁰

Part II of this Article provides historical context for science denialism. Parts III and IV discuss the beginnings of the pandemic and illustrate how science denialism has contributed to ecological degradation and our current state of crisis. Part V provides a roadmap through the conspiracy theories and other specific rhetorical tools that science denialists have used to promote distrust. Part VI evidences how that distrust has reached the upper levels of government, leading to legislation and agency dynamics that are meant to discredit scientists. Unlike

5. *Id.*

6. *See id.*

7. Albert C. Lin, *President Trump's War on Regulatory Science*, 43 HARV. ENV'T L. REV. 247, 249 (2019).

8. *See id.*

9. *See, e.g.*, Alex Samuels, *Texas Lt. Gov. Dan Patrick Says Dr. Anthony Fauci "Doesn't Know What He's Talking About"*, TEX. TRIB., <https://www.texastribune.org/2020/07/01/texas-dan-patrick-anthony-fauci-coronavirus/> (July 1, 2020, 5:00 PM) [<https://perma.cc/6BEB-YN53>].

10. *See* Marc Hetherington & Jonathan M. Ladd, *Destroying Trust in the Media, Science, and Government Has Left America Vulnerable to Disaster*, BROOKINGS (May 1, 2020), <https://www.brookings.edu/blog/fixgov/2020/05/01/destroying-trust-in-the-media-science-and-government-has-left-america-vulnerable-to-disaster/> [<https://perma.cc/9A2R-VQTM>].

the executive and legislative branches, the judiciary has sought to act as a gatekeeper to prevent this distrust in the courtroom. Part VII provides a perspective from the courtroom and explains how, for many years, the judiciary has acted as a gatekeeper in ensuring that credible science is utilized. Finally, this Article proposes that society must begin to actively take on that gatekeeping role and provides a toolbox for advocates of science to use in persuading the public to trust science again.

II. SCIENCE DENIALISM: THEN AND NOW

Most scientists and historians will tell anyone who asks that science denialism in the twenty-first century is not new.¹¹ In June 1633, Italian astronomer Galileo Galilei was charged with heresy based on his belief in Copernicanism; the Catholic Church and its political following denied his science-based revelations.¹² The church eventually put Galileo on trial, and later an official summary of the trial proceedings “revealed a clear intention to present Galileo in the worst possible light.”¹³ He was chastised and excoriated, leaving him to repent and apologize for his own findings.¹⁴ Why put him on trial? His scientific revelations initiated a quantitative study of nature and astronomy and simultaneously contradicted the religious and political views of the Catholic Church.¹⁵ After his trial, the Church denounced Galileo and condemned him to imprisonment but released him after he repented.¹⁶ Some historians say that his decision to admit error before the ten cardinals charged with deciding his fate was seen as the only rational move open to him.¹⁷ The thought was that he believed he had already taken enough risk to introduce scientific observation and

11. David L. Levine, *Science Denialism in the 21st Century*, SCI. AM.: OBSERVATIONS (July 19, 2018), <https://blogs.scientificamerican.com/observations/science-denialism-in-the-21st-century/> [<https://perma.cc/TGV7-PAYV>].

12. Alison Abbott, *Galileo's Story Is Always Relevant*, NATURE (May 4, 2020), <https://www.nature.com/articles/d41586-020-01316-6> [<https://perma.cc/6RD8-QSRA>]. Copernicanism is a school of thought derived from Nicolaus Copernicus, a mathematician and astronomer who proposed that the Earth revolved around the Sun, which was stationary in the center of the universe. Sheila Rabin, *Nicolaus Copernicus*, STAN. ENCYCLOPEDIA PHIL., <https://plato.stanford.edu/entries/copernicus/> (Sept. 13, 2019) [<https://perma.cc/7GC2-866W>]. At the time, his heliocentric ideas were very controversial, but he forever changed the way the world was viewed and came to be known as the “initiator of the Scientific Revolution.” *Id.*

13. Abbot, *supra* note 12 (quoting MARIO LIVIO, GALILEO AND THE SCIENCE DENIERS 193 (2020)).

14. *Id.*

15. *Id.*

16. Douglas O. Linder, *The Trial of Galileo: An Account*, FAMOUS TRIALS, <http://famous-trials.com/galileotrial/1014-home> [<https://perma.cc/J7XK-UPF4>].

17. *Id.*

change policy and that eventually “[the] scientific truth would take care of itself.”¹⁸

Science denialism has also appeared during previous pandemics, emerging in a parade of various conspiracy theories about the causes of the viruses. During the fourteenth century bubonic plague outbreak that killed at least a third “of Europe’s population, conspiracy theories targeted Jewish people . . . as the source of the plague.”¹⁹ Similarly, in 1918, conspiracy theorists claimed that Bayer, the German pharmaceutical company, had tainted its aspirin tablets with the Spanish Flu.²⁰

Three-hundred-and-eighty-seven years later, in the age of the Internet, Facebook, and Twitter, science denialism is still fully alive and arguably more dangerous. Not only does misinformation spread faster and feed into science denialism, but technology has allowed conspiracy theorists to make misinformation look startlingly authoritative.²¹ The new denialism feeds into policy, which directly affects the environmental health of our communities. The denial of science is taking a devastating and more immediate toll on society, and denialist tactics range from attacking scientific consensus about the anthropogenic causes of climate change to questioning the recommendations made by the Centers for Disease Control and Prevention (“CDC”) to prevent the spread of COVID-19. Now, more than ever, society needs to hear directly from public health officials and receive a clear directive from the government, one that should be based solely on science. And, never before have so many decision-makers purposely denounced, hidden, and manipulated science to fit particular policy goals.

Perhaps the scientific truth can no longer “take care of itself” because of the very denigration of the experts who are there to protect society. Certainly, science is a messy process—one in which answers and guidance change based on the best available science at the time. It is never static, and researchers are always questioning and testing re-

18. *Id.*; see also ROBERT A. NOWLIN, *MASTERS OF MATHEMATICS: THE PROBLEMS THEY SOLVED, WHY THESE ARE IMPORTANT, AND WHAT YOU SHOULD KNOW ABOUT THEM* 231 (2017).

19. Jane Coaston, *Why Coronavirus Conspiracy Theories Have Spread So Quickly*, VOX (Apr. 13, 2020, 1:00 PM), <https://www.vox.com/2020/4/13/21205833/coronavirus-pandemic-conspiracy-theories> [https://perma.cc/36DP-3N52].

20. Christopher Klein, *Why October 1918 Was America’s Deadliest Month Ever*, HIST., <https://www.history.com/news/spanish-flu-deaths-october-1918> (May 15, 2020) [https://perma.cc/8PTA-LRPJ].

21. LastWeek Tonight, *Coronavirus: Conspiracy Theories: Last Week Tonight with John Oliver*, YOUTUBE (July 20, 2020), https://www.youtube.com/watch?v=0b_eHBZLM6U&t=2s&ab_channel=LastWeekTonight [https://perma.cc/R4UE-Q9KS]; see, e.g., *Plandemic* (Elevate Films broadcast May 4, 2020) (promoting falsehoods about COVID-19 that utilize drone footage and high-end graphics from an unrelated SWAT raid footage to depict the arrest of a former scientist who promoted multiple unchallenged falsehoods throughout the series).

sults to improve upon what others have learned. The scientific method—a measurement of certainty and assurance of the validity of an experiment—is questioned and treated with skepticism by the public because of a misunderstanding of how science works. When reflecting upon what happened to Galileo Galilei, author Dr. Mario Livio mused that “processes that are not fully understood [do not] constitute flaws.”²² In other words, gaps in our knowledge do not equate to flaws, and uncertainty is inherent in the scientific process and should not be seen as detrimental to science itself. Further, it does not mean that science or scientists cannot be trusted or listened to because of what is perceived as flaws in the process or the answers. But, over the years, with climate change and now with COVID-19, the concerted effort by some of our leaders in government to discredit scientific arguments to exploit gaps in knowledge is creating a war on science with immediate and lasting effects.²³

Public opinion informs policy and influences policymakers. Without better tools to fight science deniers, they will continue to sow doubt and irreparably damage the environmental and associated public health of our society. It is important to explore the sources for denialism and how it is packaged in order to effectively advocate for the restored normalization of scientific expertise. The debate over science in modern times often blurs the line between the actual science and the moral, political, and legal implications that accompany the acceptance of science.²⁴ Some of our current “controversial” topics in science, such as climate change and taking precautionary measures to prevent the spread of COVID-19, may be widely accepted by public health officials and the medical community, but are being questioned by a significant portion of the public.²⁵ In 1991, the General Social Survey noted that 47% of Republicans and 32% of Democrats expressed a “great deal of confidence” in the scientific community.²⁶ By 2018, those numbers had essentially flipped with 50% of Democrats expressing a “great deal of confidence” in scientific experts, compared with 39% of Republicans.²⁷

22. Abbott, *supra* note 12.

23. See, e.g., Samuels, *supra* note 9. “Despite Texas’ surge of new COVID-19 cases and hospitalizations, Lt. Gov. Dan Patrick said Tuesday evening that he doesn’t need the advice of the nation’s top infectious disease doctor, Anthony Fauci.” *Id.* In an interview with Fox News host Laura Ingraham, Patrick told her, “Fauci said today he’s concerned about states like Texas that ‘skipped over’ certain things. He doesn’t know what he’s talking about . . . We haven’t skipped over anything. The only thing I’m skipping over is listening to him.” *Id.*

24. Dietram A. Scheufele, *Science Communication as Political Communication*, 111 PROC. NAT’L ACAD. SCIS. U.S. AM. 13585, 13585 (Sept. 16, 2014), <https://doi.org/10.1073/pnas.1317516111>.

25. *Id.*

26. Hetherington & Ladd, *supra* note 10.

27. *Id.*

Most academics suggest reforms on how science should be handled through legislative changes, presupposing that whichever party is in control of the executive or legislative branches will make these changes by amending laws in order to close loopholes or restoring the revered scientific expertise that was acknowledged by the Supreme Court of the United States as fundamental to agency decision-making and deserving of deference.²⁸ However, these suggestions only work when the policymakers actually *believe* in the importance of science. And, realistically, it is unlikely to happen, particularly when a majority of their constituency distrusts science and expertise.²⁹ Unfortunately, the scientific community has been slow in adjusting its communication models with our new reality and culture of “fake news” and distrust of expertise.³⁰ Scientists have taken it on the chin from particular members of the conservative movement.³¹ Science deniers within that group have focused their rhetorical weapons on the scientific community with devastating effects, including lingering skepticism of climate change, support for funding cuts in research, and even hostility toward universities and university-backed research.³² It is not just the rhetoric that is the problem; it is the initial sidelining of science and public health experts that is the root of the rhetorical attacks. Without access to the science, the lies are easier to believe.

III. PREPARING FOR A PANDEMIC?

We would expect that any administration forced to deal with a health disaster would dig into the resources and expertise of the scientists who give advice on the health and safety of our citizens. In the early days of 2017, shortly after President Trump’s inauguration, scientists with expertise in environmental health and pandemics prepared a variety of materials for the political transition teams, just as they have done with past presidents.³³ According to Michael Halpern with the Union of Concerned Scientists, Trump’s transition team had little interest in meeting with the experts.³⁴ In fact, shortly before the inauguration, there was a meeting to go over a very specific pandemic response scenario in which ventilators and treatments were in short

28. See generally *Chevron, U.S.A., Inc. v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837 (1984).

29. See, e.g., Jon D. Miller, Eugenie C. Scott & Shinji Okamoto, *Public Acceptance of Evolution*, 313 *SCIENCE* 765, 765–66 (2006) <https://doi.org/10.1126/science.1126746>; Matthew C. Nisbet & Teresa Myers, *The Polls—Trends: Twenty Years of Public Opinion About Global Warming*, 71 *PUB. OP. Q.* 444, 450 (2007) <https://doi.org/10.1093/poq/nfm03>.

30. See Hetherington & Ladd, *supra* note 10.

31. *Id.*

32. *Id.*

33. Michael Halpern, *Sidelining Science During a Pandemic*, UNION CONCERNED SCIENTISTS (May 12, 2020), <https://www.ucsusa.org/resources/sidelining-science-during-pandemic> [<https://perma.cc/J3BT-QUM9>].

34. *Id.*

supply, which indicated that a coordinated national response was paramount.³⁵ Not much happened after the meeting, according to Mr. Halpern, also noting that this lack of interest reverberated among the Environmental Protection Agency (“EPA”) and other agencies.³⁶

This initial “sidelining of science” started with disinterest and has morphed into purposeful actions meant to remove the voice of science from within. According to the Union of Concerned Scientists, these attempts have occurred more than 130 times during the tenure of the Trump administration.³⁷ Many of the attacks focused on expertise in the field of environmental health and the climate.³⁸ The undermining of rules meant to curb air pollution, protect ecological systems, and aid climate science is now inextricably linked to what we are seeing during the pandemic.

Sidelining of science and science denialism can take many forms. One of the more recent examples occurred when Trump’s EPA promoted policies designed to relax environmental standards that arguably put business interests before environmental health risks associated with increased air pollution.³⁹ In August 2018, the EPA released the Safer Affordable Fuel-Efficient (“SAFE”) Vehicles Rule, which was intended to significantly roll back fuel economy standards.⁴⁰ Experts argued that the relaxed fuel economy requirement proposed by the EPA would cause a release of approximately 900 million more tons of carbon dioxide than under Obama-era standards, significantly contributing to air pollution and exacerbating climate change.⁴¹ In a statement regarding the EPA’s new rule, EPA Administrator Andrew Wheeler⁴² commented that the new rule “strikes the right regulatory balance that protects our environment and sets reasonable targets for the auto industry.”⁴³ Not everyone agreed with Administrator

35. *Id.*

36. *Id.*

37. *Id.*

38. *Id.*

39. *Id.*

40. 49 C.F.R. §§ 531, 533 (2019). The rule requires a 1.5% increase in fuel economy each year, with a goal of achieving about forty miles per gallon by 2026—a major departure from the previous rule that mandated a 5% increase, reaching an average of fifty-four miles per gallon by 2025. *Id.*

41. Anna M. Phillips & Russ Mitchell, *Trump Weakens Fuel Economy Standards, Rolling Back Key U.S. Effort Against Climate Change*, L.A. TIMES (Mar. 31, 2020, 2:12 PM), <https://www.latimes.com/politics/story/2020-03-31/trump-rolls-back-fuel-economy-standards> [<https://perma.cc/CX6P-KMQC>].

42. Rebecca Hersher & Colin Dwyer, *Get To Know Andrew Wheeler, Ex-Coal Lobbyist With Inside Track to Lead EPA*, NPR (July 6, 2018), <https://www.npr.org/2018/07/06/6265252> [<https://perma.cc/JTG3-9C9N>]. EPA Administrator Wheeler began his career in environmental law with the EPA and served as a longtime aide to Senator James Inhofe (R-Oklahoma) who, in a 2015 floor speech, rebutted climate change with a snowball. *Id.* After leaving Congress, Wheeler worked for years as a lobbyist for some of the largest coal, chemical, and uranium companies in the United States. *Id.*

43. Phillips & Mitchell, *supra* note 41.

Wheeler. In fact, the EPA's own Science Advisory Board warned that "there were significant weaknesses in the scientific analysis of the rule."⁴⁴ Following that, in May 2020, a group of twenty-three states and the District of Columbia sued the EPA, challenging the Trump administration's decision to weaken the standards.⁴⁵ In the lawsuit, the coalition argued that the EPA's rule was unlawful because the Agency "improperly and unlawfully relied on an analysis riddled with errors, omissions, and unfounded assumptions in an attempt to justify [its] desired result."⁴⁶

And, in April 2020, in the midst of the pandemic, the EPA took another step in rolling back public health protections by weakening regulations restricting the release of mercury⁴⁷ by coal-fired power plants.⁴⁸ While the rule did not eliminate mercury restrictions, it did change the "math" on how to calculate the costs and benefits of mercury pollution.⁴⁹ The new "math" used by the EPA arguably seeks to discount the science-based positive effects restrictions have on public health while promoting the economic benefits.⁵⁰ These new calculations could have huge consequences for future environmental regulations if the same "math" is used.⁵¹

The disregard for science in this context and the loosening of air pollution rules meant to protect public health are inextricably tied to health outcomes associated with the COVID-19 global pandemic cri-

44. Letter from Michael Honeycutt, Chair, Sci. Advisory Bd., U.S. Env't Prot. Agency, to the Honorable Andrew R. Wheeler, Adm'r, U.S. Env't Prot. Agency (Feb. 27, 2020) (on file with U.S. Env't Prot. Agency).

45. David Shepardson, *U.S. States Sue Trump Administration Over Fuel Efficiency Rollback*, REUTERS (May 27, 2020, 12:59 PM), <https://www.reuters.com/article/us-usa-autos-emissions/u-s-states-sue-trump-administration-over-fuel-efficiency-rollback-idUSKBN2332UT> [<https://perma.cc/K295-8NYL>].

46. Lyssa Danigelis, *States Sue Trump Administration Over Fuel Economy Rollbacks*, ENV'T. & ENERGY LEADER (May 29, 2020), <https://www.environmentalleader.com/2020/05/states-sue-trump-may-2020/> [<https://perma.cc/6DGY-9VBB>].

47. *Mercury Pollution from Coal-Fired Power Plants*, NAT. WILDLIFE FED'N (Mar. 2011), https://www.nwf.org/~media/PDFs/Global-Warming/NWF-Mercury-Power-Plant-Factsheet_March2011.ashx [<https://perma.cc/KQH2-889Z>]. Mercury is a heavy metal and a highly potent neurotoxin linked to brain damage. *Id.* In the United States, one in six women of childbearing age has blood mercury levels that exceed levels the EPA considers safe. *Id.* Coal-fired power plants are the single largest source of mercury contamination in the United States and account for about 50% of the anthropogenic sourced emissions. *Id.*

48. See Halpern, *supra* note 33.

49. Lisa Friedman & Coral Davenport, *E.P.A. Weakens Controls on Mercury*, N.Y. TIMES, <https://www.nytimes.com/2020/04/16/climate/epa-mercury-coal.html> (Dec. 7, 2020) [<https://perma.cc/YW5N-K7QA>].

50. *Id.*

51. See *id.* Prior to the Trump Administration, the Obama-era rule allowed for the calculation of positive health outcomes as "co-benefits," such as projected gains for the health care system in the prevention of 4,700 heart attacks, 130,000 asthma attacks, and 11,000 premature deaths each year, reaching \$80 billion. *Id.* Under the Trump Administration, these co-benefits were eliminated and no longer calculated with the cost. *Id.*

sis.⁵² Prominent public health officials like Aaron Bernstein, Interim Director of the Center for Climate, Health, and the Global Environment at the Harvard T.H. Chan School of Public Health, expressed concern by noting, “What is most disconcerting to me is the administration’s lack of interest in science, and, frankly, their lack of concern for our nation’s children.”⁵³

This disregard for scientific expertise caught up to the country when Wuhan, China identified the COVID-19 virus as a threat in December 2019.⁵⁴ The virus quickly became a global pandemic due to its long period of incubation, high number of asymptomatic cases, and propensity to spread very quickly.⁵⁵ As the virus rages on across the world, and particularly in the United States, we are beginning to see the connection between the disdain for science-backed environmental health policies and the consequences for American citizens. Nationwide, low-income communities and communities of color are experiencing the combined devastation of health issues related to environmental pollution and COVID-19. And scientists are now surmising that people with two health conditions linked to air pollution, specifically inflammatory lung disease and heart disease, are at a higher risk of developing severe symptoms associated with a COVID-19 diagnosis.⁵⁶

In April 2020, scientists at the Harvard T.H. Chan School of Public Health made that connection, offering a clear link between long-term exposure to air pollution and COVID-19 death rates.⁵⁷ The researchers hypothesized that many of the pre-existing conditions that increase COVID-19 deaths are the same diseases affected by long-term exposure to air pollution.⁵⁸ After analyzing the data from more than 3,000 counties in the United States, the scientists concluded that a small increase in long-term exposure to air pollution particulates (PM_{2.5}) leads to a large increase in the COVID-19 death rate, underscoring the importance of enforcing air pollution regulations that are protective of human health—particularly during this crisis.⁵⁹ The study, accounting

52. See Hiroko Tabuchi, *In the Shadows of America’s Smokestacks, Virus Is One More Deadly Risk*, N.Y. TIMES, <https://www.nytimes.com/2020/05/17/climate/pollution-poverty-coronavirus.html> (May 19, 2020) [<https://perma.cc/BS2J-7X2Q>].

53. Friedman & Davenport, *supra* note 49.

54. See generally Chaolin Huang et al., *Clinical Features of Patients Infected with 2019 Novel Coronavirus in Wuhan, China*, 395 LANCET 497 (2020), [https://doi.org/10.1016/S0140-6736\(20\)30183-5](https://doi.org/10.1016/S0140-6736(20)30183-5) (identifying 2019-nCov as the cause of a cluster of pneumonia cases in Wuhan, China).

55. Roger Frutos et al., *Opinion, COVID-19: The Conjunction of Events Leading to the Coronavirus Pandemic and Lessons to Learn for Future Threats*, FRONTIERS MED. 1, 1 (2020), <https://doi.org/10.3389/fmed.2020.00223>.

56. Tabuchi, *supra* note 52.

57. X. Wu et al., *Air Pollution and COVID-19 Mortality in the United States: Strengths and Limitations of an Ecological Regression Analysis*, SCI. ADVANCES 1, 1 (2020), <https://doi.org/10.1126/sciadv.abd4049>.

58. *Id.*

59. *Id.*

for other factors like smoking and population density, tied a severe increase in deaths to a modest increase in fine particulate pollution.⁶⁰ This data highlights what the country has seen with the racial disparity in COVID-19 deaths—poorer neighborhoods and communities of color living near pollution tend to be exposed to higher levels of air pollution than affluent, white communities and are also more susceptible to higher morbidity and mortality rates associated with COVID-19.⁶¹ And this is occurring despite the Trump administration’s car-emission rule which, even by its own analysis, would cause even more premature deaths due to air pollution.⁶² When asked about whether the EPA was studying the link between air pollution and the virus, an Agency spokeswoman referred the question to the CDC and asserted that while asserting that the rollback on the air pollution rules would “lead to some air quality improvements.”⁶³ Although the researchers say that there is a sound link, more studies must be conducted to confirm the findings.⁶⁴

IV. SCIENCE DENIALISM, ENVIRONMENTAL DEGRADATION, AND COVID-19

The link between science denialism, environmental policy, and COVID-19 can no longer be ignored or denied. Environmental policy decisions have arguably led to, or at the very least, contributed to, the current pandemic crisis. Environmental scientists have known for some time and are now warning us that our disregard for science and our “promiscuous treatment of nature” will lead to more pandemics like COVID-19 in our lifetime.⁶⁵ According to the CDC, about 75% of the new or emerging diseases that infect humans are *zoonotic*, or originate in animals.⁶⁶ Scientists who have studied the link between viruses, exotic wildlife, and the destruction of their habitats through continued deforestation⁶⁷ are finding that the necessity for increased land development is driving exotic species out of their natural habitats

60. *Id.* For example, a person who lives in a county with high levels of particulate matter for decades is 11% more likely to die from COVID-19 than someone in a region with one unit less of particulate matter. *Id.*

61. *See id.* at 1–6; *see also* Lisa Friedman, *New Research Links Air Pollution to Higher Coronavirus Death Rates*, N.Y. TIMES, <https://www.nytimes.com/2020/04/07/climate/air-pollution-coronavirus-covid.html> (Apr. 17, 2020) [<https://perma.cc/6Z5G-4RXF>].

62. Friedman, *supra* note 61.

63. *Id.*

64. *Id.*

65. Jonathan Watts, ‘Promiscuous Treatment of Nature’ Will Lead to More Pandemics – Scientists, GUARDIAN (May 7, 2020, 2:00 PM), <https://www.theguardian.com/environment/2020/may/07/promiscuous-treatment-of-nature-will-lead-to-more-pandemics-scientists> [<https://perma.cc/Z8QF-SJHD>].

66. *Id.*

67. Aneta Afelt, Roger Frutos & Christian Devaux, *Bats, Coronaviruses, and Deforestation: Toward the Emergence of Novel Infectious Diseases?*, FRONTIERS MICROBIOLOGY 1, 2 (2018), <https://doi.org/10.3389/fmicb.2018.00702>.

and closer to humans, where they interact with each other and create new strains of disease like COVID-19.⁶⁸ Southeast Asia has lost 30% of its forest surface over the last forty years.⁶⁹ This deforestation has been exacerbated by the human population explosion in Southeast Asia by 130 million between 2001 and 2011, which is expected to further increase by 250 million by 2030.⁷⁰ Researchers argue that this demographic growth necessitates changes in land uses to support increased urbanization and intensive farming needs.⁷¹

Although it is not possible to predict the emergence of a disease like COVID-19 because it is truly accidental,⁷² we arguably should have been able to predict its emergence from the scientific data gathered from previous coronavirus (“CoV”) outbreaks.⁷³

According to Dr. Roger Frutos, a leading scientist in zoonotic research, there are three conditions that must be fulfilled for an infectious disease to emerge.⁷⁴ First, the pathogen must be able to infect and reproduce in humans; second, there must be contact between humans and the pathogen reservoir; and third, there must be contact between humans and the source and a human-to-human urban cycle.⁷⁵ COVID-19 fits all three.⁷⁶ Two years ago, virologists predicted what is now our COVID-19 crisis, hypothesizing the emergence and spread of a CoV, like COVID-19, to humans.⁷⁷ To the virologists, the factors were there: deforestation, increased co-mingling of a species like bats carrying CoV with domesticated animals and humans, and eventual transmission.⁷⁸ Bats, a well-known disease-carrying species—and the likely origin of COVID-19—host these diseases and can more easily transfer them to animals and humans because they are moving near ecosystems touched by humans, such as cleared forests or swamps drained for farming purposes.⁷⁹ Historically, bats have kept to more wild, niche habitats, which made transfer to humans and animals that humans have normal contact with less likely.⁸⁰ Upon destruction of

68. Watts, *supra* note 65.

69. Afelt, Frutos & Devaux, *supra* note 67, at 2.

70. *Id.*

71. *Id.*

72. Frutos et al., *supra* note 55.

73. *Id.*

74. *Id.*

75. *Id.*

76. *Id.* The author notes that what really favored the spread of COVID-19 was the “exceptional conjunction” in Wuhan of several independent aggravating events during December 2019, including three major celebrations in a short time, the resulting movement and storage of very large amounts of food, including live animals in wet markets, and very high attendance at these markets during that time. *Id.* at 3. Additionally, the high human mobility for holidays in January 2019, intense mobility of goods, and “a long period of silent incubation of SARS-CoV-2.” *Id.*

77. Afelt, Frutos & Devaux, *supra* note 67, at 1.

78. *Id.* at 4.

79. *Id.* at 1–2.

80. *See id.*

their well-established habitats, bats were forced to move closer to humans,⁸¹ and the probability of zoonotic transfer increased exponentially.⁸² Although there has been no documented direct transfer to humans, the most likely spread is to other animals.⁸³ These animals are often captured or sold in wet markets (or live animal markets) across Asia. It is therefore easy to imagine how a live market, like the Wuhan wet market, was the origin of COVID-19.⁸⁴ But, with conspiracy theories abound, and even those touted by the president about the origins of the virus,⁸⁵ every fundamental, scientific piece of information about the virus has been disputed, leaving the public with a sense of confusion.

Similar zoonotic transmissions have been observed in the past. In 2017, Alessandra Berto, along with other researchers, documented that 4.4% of the rats sold in live markets carried CoV.⁸⁶ Further, CoV variations have been reported as endemic and responsible for mild to moderate respiratory tract diseases in humans for more than three decades.⁸⁷ And based on data collected over the past few decades, in 2018, researchers concluded that the risk that a virus would emerge was very high and recommended surveillance, early warning, and intervention to prevent a possible pandemic, stating the “risk of newly emerging CoVs-associated diseases in the future should be considered seriously.”⁸⁸ As if they held a crystal ball, the researchers also warned in a published study that, “[i]t will certainly be crucial to pay special attention to ‘superspreaders’ who are very efficient at transmitting CoVs through exposure to respiratory droplets.”⁸⁹

Despite the warnings from multiple scientists of an impending pandemic, the Trump administration continued to denigrate the efforts of the scientists charged with studying the zoonotic transmission of viral

81. *Id.* at 2. Bats generally feed on insects, and house lights attract insects, while houses, barns, orchards and fields offer shelter to the bats. *Id.*

82. *See id.*

83. *Id.* at 4.

84. *See id.* at 2.

85. Geoff Brumfiel, *As Trump Pushes Theory Of Virus Origins, Some See Parallels in Lead-Up to Iraq War*, NPR (May 6, 2020, 8:57 AM), <https://www.npr.org/2020/05/06/851043242/as-trump-pushes-theory-of-virus-origins-some-see-parallels-to-iraq> [<https://perma.cc/R5H5-BCRD>]. Specifically, in late April and early May 2020, President Trump and others from his administration repeatedly claimed to have intelligence showing that COVID-19 accidentally escaped from a lab in China. *Id.* An official press release from the Director of National Intelligence pushed back on that theory, saying there was not yet conclusive evidence for that theory. *Id.* And independent scientists remarked that the chances of a laboratory accident were very small, while the odds of the infection being transmitted between animals and humans in nature were high. *Id.*

86. A. Berto et al., *Detection of Potentially Novel Paramyxovirus and Coronavirus Viral RNA in Bats and Rats in the Mekong Delta Region of Southern Viet Nam*, 65 ZOOZOSES & PUB. HEALTH 30, 32 (2017), <https://doi.org/10.1111/zph.12362>.

87. Afelt, Frutos & Devaux, *supra* note 67, at 2.

88. *See id.* at 4.

89. *Id.*

outbreaks. One of the most egregious examples occurred when faulty and unsubstantiated allegations by conservative politicians and media led to the National Institutes of Health cutting \$3.7 million dollars of funding for ecologists who were studying coronaviruses.⁹⁰ The agency cut the grant in April 2020 after political news outlets—without evidence⁹¹—alleged that a majority of the grant money went to the laboratory in Wuhan, China, from which the coronavirus escaped.⁹² The grant’s abrupt termination came seven days after a reporter asked then-President Trump about the project at a press conference, to which he replied, “We will end that grant very quickly.”⁹³ The NIH declined to comment on why it canceled the grant, which was in its sixth year of renewed funding, but critics fear that the funding cut was just another diversion from science in favor of a conspiracy theory.⁹⁴ The grant’s principal investigator, Dr. Peter Dazsak, a well-respected scientist and president of the U.S.-based nonprofit EcoHealth Alliance,⁹⁵ and his colleagues collaborated with a leading Chinese virologist, Dr. Shi Zhengli, who also studied coronaviruses in bats and who happened to be based at the Wuhan Institute of Virology, located in the city where researchers first identified SARS-CoV-2, what is now known as COVID-19.⁹⁶ The team worked to understand how coronaviruses jump from bats to humans and to develop diagnostic tools, treatments and vaccines.⁹⁷ To date, there is no scientific evidence that SARS-CoV-2 originated in Dr. Zhengli’s bats.⁹⁸

In the first years of its funding, the grant produced numerous published papers and scientific advancements, including the genetic sequencing of two bat coronaviruses now used as lab tools to test the antiviral, remdesivir.⁹⁹ In fact, after the first four years, the grant was renewed for an additional five years after receiving an outstanding

90. Meredith Wadman & Jon Cohen, *NIH’s Axing of Bat Coronavirus Grant a ‘Horrible Precedent’ and Might Break Rules, Critics Say*, AM. ASSOC. FOR ADVANCEMENT SCI. (Apr. 30, 2020, 7:20 PM), <https://www.sciencemag.org/news/2020/04/nih-s-axing-bat-coronavirus-grant-horrible-precedent-and-might-break-rules-critics-say> [<https://perma.cc/XE4N-7BMH>]; see also Scott Pelley, *Trump Administration Cuts Funding for Coronavirus Researcher, Jeopardizing Possible COVID-19 Cure*, CBS NEWS: 60 MINUTES (May 11, 2020), <https://www.cbsnews.com/news/trump-administration-coronavirus-vaccine-researcher-covid-19-cure-60-minutes/> [<https://perma.cc/9QXF-8J63>].

91. Trump administration officials repeatedly pressured U.S. intelligence agencies to produce firm evidence to support the theory that the virus escaped from the lab, but these agencies have not been able to confirm a connection to date. *Id.*

92. *Id.*

93. *Id.*

94. See *id.*

95. *Id.*

96. Nidhi Subbaraman, *‘Heinous!’: Coronavirus Researcher Shut Down for Wuhan-lab Link Slams New Funding Restrictions*, NATURE (Aug. 21, 2020), <https://www.nature.com/articles/d41586-020-02473-4> [<https://perma.cc/3TR4-PBQ7>].

97. Pelley, *supra* note 90.

98. *Id.*

99. *Id.*

peer-review score.¹⁰⁰ When asked about why this particular grant was so important, Dr. Peter Daszak responded that

It matters because . . . our work is used in developing vaccines and drugs to save American lives . . . if we really want to know where viruses are going to emerge and cause the next pandemic, we need to have scientific collaborations like this. . . . We are the frontline of preventing the next pandemic. . . . And we need to get on with our job.¹⁰¹

When the NIH canceled the grant, it cited the termination section of its Grants Policy Statement, noting that an agency may cancel a grant “to protect the public health and welfare from the effects of a serious deficiency.”¹⁰² Dr. Daszak’s colleagues were puzzled as to how his grant, titled “Understanding the Risk of the Bat Coronavirus Emergence,” could be a danger to public health.¹⁰³ Soon thereafter, a group of seventy-seven Nobel laureates asked for an investigation into the grant’s cancellation, characterizing the NIH’s explanation as “preposterous.”¹⁰⁴ The former director of the emerging threats division of the U.S. Agency for International Development (“USAID”) echoed the concern that “[t]here’s a culture of attacking really critical science for cheap political gain.”¹⁰⁵ Essentially, the grant was cancelled as a result of the mischaracterization and misuse of facts fueled by a conspiracy theory, one of several tools used by science denialists.¹⁰⁶

V. THE TOOLBOX OF RHETORICAL ARGUMENTS USED TO DISCREDIT SCIENCE

Science denialism has been defined as “the employment of rhetorical arguments to give the appearance of legitimate debate where there is none, an approach that has the ultimate goal of rejecting a proposition on which a scientific consensus exists.”¹⁰⁷ Rhetoric has long formed the basis of legal arguments, particularly in the courtroom.

100. *Id.*

101. *Why it Matters that the NIH Cancelled a Coronavirus Research Grant* (CBS 60 Minutes Overtime) (May 10, 2020), <https://www.youtube.com/watch?v=iagUDDyhf64> (partial transcript available at <https://www.cbsnews.com/news/nih-cancelled-coronavirus-research-grant-60-minutes-2020-05-10/> [<https://perma.cc/3U5M-VQPN>]).

102. NAT’L INSTS. OF HEALTH, 8.5.2 REMEDIES FOR NONCOMPLIANCE OR ENFORCEMENT ACTIONS: SUSPENSION, TERMINATION, AND WITHHOLDING OF SUPPORT (rev. Dec. 2019), https://grants.nih.gov/grants/policy/nihgps/html5/section_8/8.5.2_remedies_for_noncompliance_or_enforcement_actions-suspension_termination_and_withholding_of_support.htm [<https://perma.cc/97MD-W4AK>].

103. Wadman & Cohen, *supra* note 90.

104. James Gorman, *Prominent Scientists Denounce End to Coronavirus Grant*, N.Y. TIMES (May 21, 2020), <https://www.nytimes.com/2020/05/21/health/wuhan-coronavirus-laboratory.html> [<https://perma.cc/JR73-6JXJ>].

105. Wadman & Cohen, *supra* note 90.

106. *Id.*

107. Pascal Diethelm & Martin McKee, Viewpoint, *Denialism: What Is It and How Should Scientists Respond?*, 19 EUR. J. PUB. HEALTH 2, 2 (Jan. 2009), <https://doi.org/10.1093/eurpub/ckn139>.

Aristotle created the idea of the rhetorical argument and identified three primary methods of persuasion: (1) *logos*, focusing on the logic of the argument; (2) *pathos*, focusing on invoking the audience's passion; and (3) *ethos*, focusing on the credibility or the ethics of the message's deliverer.¹⁰⁸ When used, they form an effective way to persuade the intended audience.¹⁰⁹ Scientific research is based on rationality and objectivity, but scientists often struggle with figuring out how to convey the meaning of their research in a persuasive way.¹¹⁰ Science denialism takes advantage of this fact and utilizes *logos*, *pathos*, and *ethos* in a way that attacks the research by questioning the logic of the researchers' methods and conclusions, using misinformation and faulty facts.¹¹¹ Science denialists also appeal to the audience's passions through fear and use conspiracy theories and even attack the credibility or *ethos* of scientists, often questioning their motivations and bias.¹¹² Certainly, lawyers use these techniques in a courtroom in an adversarial manner, often with expert witnesses, but a judge utilizes rules of evidence to qualify expert witnesses and ensure that the expert bases his opinion on relevant and reliable science.¹¹³ This gatekeeping role allows the lay juror to make assessments based on what is already considered to be credible. The coordinated public attack on science by conspiracy theorists and science denialists is much different in that there is no safety net, or rather, no trusted person to vet the information.

The effects of science denialism have been swift and devastating to the scientific community, thereby harming the necessary communication of critical, science-based information and guidance to the public. Over the past decade, denialism has gone mainstream and now has an undeniable grip on what is considered the truth.¹¹⁴ Dr. Pascal

108. Lara Varpio, *Using Rhetorical Appeals to Credibility, Logic, and Emotions to Increase Your Persuasiveness*, 7 *PERSPS. MED. EDUC.* 207, 207 (2018), <https://doi.org/10.1007/s40037-018-0420-2>.

109. *Id.*

110. *Id.*

111. *See id.*

112. Sean B. Carroll, *The Denialist Playbook*, *SCI. AM.* (Nov. 8, 2020), <https://www.scientificamerican.com/article/the-denialist-playbook/> [<https://perma.cc/356W-VN9G>].

113. This is often done through a "*Daubert* hearing, where a judge will evaluate whether or not an expert's testimony and evidence are admissible, out of the jury's presence and prior to trial." Anjelica Cappellino, *The Daubert Standard: A Guide to Motions, Hearings, and Rulings*, *EXPERT INST.*, <https://www.expertinstitute.com/resources/insights/the-daubert-standard-a-guide-to-motions-hearings-and-rulings/> (Feb. 17, 2021) [<https://perma.cc/J99C-D5LW>]; *see also* *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993).

114. *See* *AFTER TRUTH: DISINFORMATION AND THE COST OF FAKE NEWS* (HBO Documentary Films 2020). The documentary focuses on the recent history of "fake news" and falsehoods, starting with the 2015 panic over the Jade Helm military exercise, which conspiracy theorists spun as cover to round up political dissidents and to imprison them in former Walmart stores. *Id.*; *see also* James Poniewozik, *Review: 'Af-*

Diethelm and Dr. Martin McKee argue that science denialists employ five fundamental characteristics of denialism.¹¹⁵ These characteristics make up a “toolbox” that denialists utilize to sideline science.¹¹⁶

The first tool is the popular “conspiracy theory” that denialists often use.¹¹⁷ A conspiracy theory is founded upon disinformation or propaganda, which erodes public trust and, in the case of COVID-19, undermines public health officials.¹¹⁸ The distrust and related conspiracy theories have exponentially increased in recent years, dating back to 2015 when the hysteria over the Jade Helm federal military exercise reached high enough levels to cause the governor of Texas to ask the Texas State Guard to monitor the exercise.¹¹⁹ Although the public has always held a level of distrust in the government, Jade Helm, among other conspiracy theories,¹²⁰ marked the beginning of a new era of the “conspiracy theory” and the distrust of government officials, academics, and scientists.¹²¹ The dangerous thing about conspiracy theories is that once they become commonly accepted explanations, or the only explanations in the absence of evidence-based explanations, they cease to be conspiracy theories and transform into history or fact.¹²² Researchers have found that in any given year about half of the public

ter Truth,’ *The Deluge*, N.Y. TIMES (Mar. 18, 2020), <https://www.nytimes.com/2020/03/18/arts/television/review-after-truth.html> [<https://perma.cc/VZR8-DPKC>].

115. Diethelm & McKee, *supra* note 107, at 2.

116. *Id.*

117. *Id.*

118. Max Fisher, *Why Coronavirus Conspiracy Theories Flourish. And Why It Matters*, N.Y. TIMES (Apr. 8, 2020), <https://www.nytimes.com/2020/04/08/world/europe/coronavirus-conspiracy-theories.html> [<https://perma.cc/R5XX-LXZX>].

119. Cassandra Pollock & Alex Samuels, *Hysteria over Jade Helm Exercise in Texas Was Fueled by Russians, Former CIA Director Says*, TEX. TRIB., <https://www.texastribune.org/2018/05/03/hysteria-over-jade-helm-exercise-texas-was-fueled-russians-former-cia/> (May 3, 2018, 2:00 PM) [<https://perma.cc/J9XP-ZAFR>]. Jade Helm 15 was a planned, routine military training exercise in Bastrop, Texas in 2015. *Id.* The first conspiracy theory argument, appearing in All News Pipeline in March 2015, was that it really was preparation for World War III, suggesting that the military would murder gun owners after having collected their GPS coordinates. *Id.* The theory worked its way over to Infowars.com and into some reputable conservative circles, arguably due to The Drudge Report. Philip Bump, *The Jade Helm Conspiracy Theory, Explained*, WASH. POST (July 16, 2015), <https://www.washingtonpost.com/news/the-fix/wp/2015/05/06/how-obamas-hostile-takeover-of-the-american-southwest-a-k-a-jade-helm-will-impact-2016/?arc404=true> [<https://perma.cc/A85G-F8PW>].

120. John Sides, *Fifty Percent of Americans Believe in Some Conspiracy Theory. Here’s Why.*, WASH. POST (Feb. 19, 2015, 8:00 AM), <https://www.washingtonpost.com/news/monkey-cage/wp/2015/02/19/fifty-percent-of-americans-believe-in-some-conspiracy-theory-heres-why/> [<https://perma.cc/JQ8Q-9X2T>]. Other conspiracies include the “birther” conspiracy about President Obama championed by then-presidential candidate Donald Trump (endorsed by a staggering 25% of the public) and the conspiracy that the FDA was deliberately withholding cures for cancer (endorsed by 40% of the public). *Id.*

121. *Id.*

122. *Id.*

generally endorses at least one conspiracy theory, which is alarming.¹²³

Conspiracy theories are often made up of rumors of secret cures and other pieces of forbidden knowledge that, when shared, provide feelings of certainty and control amid a crisis.¹²⁴ These rumors and wildly unbelievable claims are spread by everyday people, who psychologists say are often overwhelmed by feelings of confusion and helplessness.¹²⁵ High-level government officials also promote conspiracy theories to hide failures or seek political benefits.¹²⁶ Currently, COVID-19 conspiracy theories are abound as the fear from the pandemic provides the perfect breeding ground.¹²⁷ A June 2020 Pew Research Center survey asked 9,654 participants if they heard of the conspiracy theory that global elites like Bill Gates or George Soros planned the COVID-19 pandemic.¹²⁸ 71% of the participants said they had heard that theory, and one-third of that same group said it was “definitely or probably true.”¹²⁹ Why do some people believe in conspiracy theories? Because, in addition to feelings of disenfranchisement or anxiety, they possess the tendency to believe that big events have big causes.¹³⁰ The key to a conspiracy theory is that it typically needs just one plausible element that does not have to necessarily be true—just plausible.¹³¹ For example, there are people who have stated that they do not intend to get a COVID-19 vaccine because it will contain microchips that will later be used to track them.¹³² While the theory is untrue, there is a tenuous and plausible connection to a published paper that details how a technology called “quantum dots” could be delivered to the skin to produce light and show that an individual has been vaccinated—not track the person.¹³³

123. *Id.*; see J. Eric Oliver & Thomas J. Wood, *Conspiracy Theories and the Paranoid Style(s) of Mass Opinion*, 58 AM. J. POL. SCI. 952, 952 (2014) <https://doi.org/10.1111/ajps.12084>.

124. Sides, *supra* note 120.

125. *Id.*

126. *Id.*

127. Monika Evstatieva, *Anatomy of a COVID-19 Conspiracy Theory*, NPR (July 10, 2020, 3:45 PM), <https://www.npr.org/2020/07/10/889037310/anatomy-of-a-covid-19-conspiracy-theory> [<https://perma.cc/6H3V-LRHJ>].

128. *Id.*; Amy Mitchell et al., *Three Months In, Many Americans See Exaggeration, Conspiracy Theories and Partisanship in COVID-19 News*, PEW RSCH. CTR. (June 29, 2020), <https://www.journalism.org/2020/06/29/three-months-in-many-americans-see-exaggeration-conspiracy-theories-and-partisanship-in-covid-19-news/> [<https://perma.cc/95SV-G7VQ>].

129. Evstatieva, *supra* note 127.

130. See Melinda Wenner Moyer, *People Drawn to Conspiracy Theories Share a Cluster of Psychological Features*, SCI. AM. (Mar. 2019), <https://www.scientificamerican.com/article/people-drawn-to-conspiracy-theories-share-a-cluster-of-psychological-features/> [<https://perma.cc/Z6P6-VEEL>].

131. Evstatieva, *supra* note 127.

132. *Id.*

133. *Id.*

Another common theme of all conspiracy theories is that an individual is supposedly being kept from learning about the “secret truths that ‘they’ [do not] want you to hear.”¹³⁴ In a time of crisis, these “truths” help explain the chaos.¹³⁵ The rhetorical argument plays out in the following way: when an overwhelming body of scientists agree that something is true, the denialist argues that the overwhelming scientific agreement did not occur “because those scientists have independently studied the evidence and reached the same conclusion.”¹³⁶ Rather, all of these scientists engaged in a secretive, complex conspiracy meant to deceive the public.¹³⁷ And, they likely did it through the process of peer review where conspirators simply suppressed the dissenter, as opposed to weeding out data and opinions that were not supported by evidence or logical thought.¹³⁸ This is no more evident than in the current haze that denialism has created for the scientific agreement on the cause of climate change.¹³⁹ Around 97% of publishing climate scientists agree that human activity is one of the primary causes of climate change.¹⁴⁰ While this consensus continues to grow, there is a small, politically charged portion of the public that actively opposes this mainstream scientific opinion.¹⁴¹ There are a number of reasons why the opposition and rejection of scientific evidence persist.¹⁴² Conservative think tanks with funding from vested interests and political action committees¹⁴³ have played a primary role in sourcing misinformation, playing to the public’s political ideology,¹⁴⁴ and

134. Fisher, *supra* note 118.

135. *Id.*

136. Diethelm & McKee, *supra* note 107, at 2.

137. *Id.*

138. *Id.*

139. John Cook, *Countering Climate Science Denial and Communicating Scientific Consensus*, OXFORD RSCH. ENCYCLOPEDIAS, CLIMATE SCI. (Oct. 26, 2016), <https://doi.org/10.1093/acrefore/9780190228620.013.314>.

140. *Id.* The article attributes global warming to human activity. *Id.* However, global warming is just one part of climate change, and NASA has explained that the term “[c]limate change or global climate change is generally considered a ‘more scientifically accurate term,’ than global warming . . . because ‘Changes to precipitation patterns and sea level are likely to have much greater human impact than the high temperatures alone.’” Marshall Shepherd, *Climate Change or Global Warming? Three Reasons Not to Be Distracted by The Name Game*, FORBES (Apr. 13, 2018, 9:00 AM), <https://www.forbes.com/sites/marshallshepherd/2018/04/13/climate-change-or-global-warming-three-reasons-not-to-be-distracted-by-the-name-game/#1ba2f7f15088> [<https://perma.cc/6CDC-66GU>] (quoting Joseph Romm, *Is There a Difference Between Global Warming and Climate Change?*, YEARS PROJECT, <https://theyear-sproject.com/ask-joe/difference-global-warming-climate-change/> [<https://perma.cc/8LPR-8UZZ>]).

141. Cook, *supra* note 139, at 1.

142. *Id.*

143. *Id.*; see also WILLIAM N. ROM, ENVIRONMENTAL POLICY AND PUBLIC HEALTH 243 (John Wiley & Sons ed. 2012).

144. Inside Washington, *Congressional Insider’s Poll*, NAT’L J. 6, 6–7 (Feb. 3, 2007), https://syndication.nationaljournal.com/images/203Insiderspoll_NJlogo.pdf [<https://perma.cc/FA6M-Y5FK>]. When asked, “Do you think it’s been proven beyond a rea-

attempting to cast doubt on the level of scientific agreement about climate change.¹⁴⁵ This distrust and confusion is fueled by media outlets that provide equal time to climate deniers as a “balanced” perspective for viewers.¹⁴⁶ While polling suggests that about 70% of the American public generally trusts the opinion of climate scientists on climate change,¹⁴⁷ the remaining doubt contributes to the gap between the public’s perception of the scientific agreement¹⁴⁸ and the remarkable 97% consensus among climate science experts.¹⁴⁹ This creates a consensus gap between experts and public perception, resulting in a decrease in public support for climate change policies and legislation.¹⁵⁰

Relevant and credible science is also questioned through the use of fake experts, or those who purport to be “experts” but whose views are entirely inconsistent with an established scientific consensus.¹⁵¹ We can look no further than the tobacco industry and its tactic of “scoring” scientists who studied the health effects of tobacco in relation to how supportive they were of the tobacco industry’s stance.¹⁵² In the 1980s, an executive from Phillip Morris developed a plan to recruit scientists to support the company’s position on second-hand smoke while concealing the scientists’ ties to tobacco through “front organizations.”¹⁵³ The use of fake experts has extended far beyond the tobacco industry, permeating the argument against the scientific consensus on climate change.¹⁵⁴ In 1998, the American Petroleum Institute set out to purposely recruit scientists who “share[d] the industry’s views of climate science who [could] help convince journalists, politicians[,] and the public that the risk of global warming [was] too uncertain to justify controls on greenhouse gasses.”¹⁵⁵

sonable doubt that the Earth is warming because of man-made problems?” 95% of Democrats responded *Yes*; 84% of Republicans responded *No*. *Id.*

145. Cook, *supra* note 139, at 1, 6.

146. Hannah Osborne, *U.S. Media Gives Way Too Much Air Time to Climate Change Deniers Who Don’t Know What They’re Talking About, Study Finds*, NEWSWEEK (Aug. 15, 2019, 8:49 AM), <https://www.newsweek.com/media-air-time-climate-change-deniers-scientists-1454498> [<https://perma.cc/G86J-PW2B>].

147. See William R. L. Anderegg et al., *Expert Credibility in Climate Change*, 107 PROCS. NAT’L ACAD. SCIS. U.S.A. 12107, 12107 (Jul. 6, 2010), <https://doi.org/10.1073/pnas.1003187107>.

148. *Id.* Dr. Anderegg and his colleagues published an extensive dataset of 1,372 climate scientists, their publications and data showing that 97–98% of climate scientists most active in publishing agreed that climate change is primarily anthropogenic (or manmade) as outlined by the International Panel on Climate Change. *Id.*

149. *Id.*

150. *See id.*

151. Diethelm & McKee, *supra* note 107, at 2.

152. *Id.*

153. *Id.*

154. *See id.* at 3.

155. *Id.* (alteration in original); see also GREENPEACE INT’L, DENIAL AND DECEPTION: A CHRONICLE OF EXXONMOBIL’S EFFORTS TO CORRUPT THE DEBATE ON

Fake experts have also invaded social media, commenting on the cause, spread, and seriousness of COVID-19. In April 2020, YouTube removed a viral (and now debunked) video of two Bakersfield, California doctors who downplayed the threat of COVID-19 and made dubious claims that it had already spread widely and was therefore not dangerous after it received more than five million views.¹⁵⁶ The doctors, neither of whom were epidemiologists, shared their conclusions about the results of COVID-19 tests at their clinics, extrapolating the evidence to the California population as a whole and contradicting Governor Newsom's shelter-in-place order.¹⁵⁷ YouTube, in removing the video from its platform, cited its misinformation policy, while the video's originators received widespread condemnation from health officials who called their claims "reckless and untested musings."¹⁵⁸

Fake experts also feed their COVID-19 conspiracy theories to the public through the news organizations responsible for informing them. A recent example of this phenomenon was the controversial decision by Sinclair Broadcast Group, which owns one of the largest local television networks in the country, to air a new interview with the discredited researcher and conspiracy theorist Judy Mikovits.¹⁵⁹ Mikovits was a medical researcher featured in the discredited "Plandemic" documentary-style video that went viral in early 2020, and which multiple platforms like Facebook and YouTube banned for its false and misleading claims about the virus.¹⁶⁰

The second tool in the denialism toolbox is the promotion of fake scientific experts, often used in conjunction with the "stacking" of scientific panels and committees with industry-friendly scientists to provide advice to the U.S. government.¹⁶¹ Historically, the government

GLOBAL WARMING 4-5 (2002), <https://www.greenpeace.org/usa/wp-content/uploads/2015/11/exxon-denial-and-deception.pdf> [<https://perma.cc/CB57-XWXA>].

156. CNN Wire, *Dubious COVID-19 Claims Made by 2 Bakersfield-Area Doctors Condemned by Health Experts; YouTube Removes Video*, KTLA-5 CAL., <https://ktla.com/news/california/dubious-covid-19-claims-by-made-2-bakersfield-area-doctors-condemned-by-health-experts-youtube-removes-video/> (Apr. 29, 2020, 9:02 PM) [<https://perma.cc/7KXM-F8U3>].

157. *Id.* During the conference, Dr. Erickson remarked, "Do we need to still shelter in place? Our answer is emphatically no. Do we need businesses to be shut down? Emphatically no. Do we need to test them and get them back to work? Yes, we do." *Id.*

158. *Id.*

159. Oliver Darcy, *Local TV Stations Across the Country Set to Air Discredited 'Plandemic' Researcher's Conspiracy Theory About Fauci*, CNN BUS. <https://www.cnn.com/2020/07/24/media/sinclair-fauci-conspiracy-bolling/index.html> (July 25, 2020, 11:51 PM) [<https://perma.cc/4P5G-3X3A>].

160. *Id.* During the interview, Mikovits told news host Eric Bolling that Dr. Fauci "manufactured" and shipped coronaviruses to Wuhan, China over the past decade. *Id.* Bolling noted the "hefty claim," but failed to meaningfully challenge Mikovits and allowed her to make her case. *Id.*

161. David Michaels et al., *Advice Without Dissent*, 298 SCI. 703, 703 (2002), <https://doi.org/10.1126/science.298.5594.703>. Michaels provides the example of when ExxonMobil successfully opposed the reappointment of the Chair of the Intergovernmental Panel on Climate Change.

sought to find objective scientific experts to provide advice that would ideally inform regulatory decisions.¹⁶² The scientific community often produces volumes of data on human health hazards; however, political and economic concerns now heavily influence the process of interpretation, which ultimately results in policy development.¹⁶³ Not surprisingly, government officials are removing many widely respected scientists from committees in favor of industry-backed scientists.¹⁶⁴ These scientists tend to skew or censor their interpretation of data to align with political preferences.¹⁶⁵ Additionally, false accusations that question scientists' motives often denigrate established scientific experts.¹⁶⁶

A third tactic denialists employ is selectivity, which focuses attention on isolated papers that challenge the dominant scientific consensus, or in the alternative, accentuates the flaws of the weakest papers to discredit the entire body of scientific evidence.¹⁶⁷ One of the most famous examples of this tactic is anti-vaccination advocates' reference to the 1998 *Lancet* article that suggested a link between the measles, mumps, and rubella immunization to autism in children.¹⁶⁸ This debate still continues—even at the highest level of government—despite the *Lancet* authors' retractions.¹⁶⁹ In fact, former President Trump sent tweets linking vaccines with autism, like his 2014 tweet: "Healthy young child goes to the doctor, gets pumped with massive shots of vaccines, doesn't feel good and changes – AUTISM. Many such cases!"¹⁷⁰ These tweets were more impactful than one might think. A recent 2020 study in the *Journal of Experimental Social Psychology*

tal Panel on Climate Change ("IPCC"), leading a group of prominent American scientists to state that "stacking these public committees out of fear that they may offer advice that conflicts with administration policies devalues the entire federal advisory committee structure." *Id.*; Diethelm & McKee, *supra* note 107, at 3.

162. Tim Lougheed, *Outside Looking In: Understanding the Role of Science in Regulation*, 117 *ENV'T HEALTH PERSPS.* A105, A105 (2009), <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2661928/pdf/ehp-117-a104.pdf> [<https://perma.cc/GT3E-LYF9>].

163. *Id.*

164. *Id.*; Michaels et al., *supra* note 161.

165. *Id.*

166. Diethelm & McKee, *supra* note 107, at 3. Dr. Diethelm points to Dr. Stanton Glantz, a professor of medicine who was a target for tobacco denialists. *Id.* By way of example, the Forces International Liberty News website states that "he cynically implies his research into smoking is science, banking on the sad fact that politicians, let alone the media, have no idea that epidemiology is not real science . . ." *Id.* (quoting "Cutting Edge" Comedy, FORCES INT'L. (Sept. 17, 2008), http://www.forces.org/News_Portal/news_viewer.php?id=1412 [<https://perma.cc/4NXZ-LC39>]).

167. *Id.*

168. *Id.*; see A.J. Wakefield et al., *Illegal-Lymphoid-Nodular Hyperplasia, Non-Specific Colitis, and Pervasive Developmental Disorder in Children*, 351 *LANCET* 637, 641 (1998).

169. Simon H. Murch et al., *Retraction of an Interpretation*, 363 *LANCET* 750 (2004).

170. See Eric W. Dolan, *New Study Finds Trump's Tweets Intensify Anti-Vaccine Attitudes Among His Supporters*, PSYPOST (Apr. 3, 2020), <https://www.psypost.org/2020/04/new-study-finds-trumps-tweets-intensify-anti-vaccine-attitudes-among-his-supporters-56359> [<https://perma.cc/SG4D-L3QC>].

demonstrates that messages like this have an overall negative impact on the public perception of vaccine efficacy and safety.¹⁷¹ Selectivity was also used by President Trump to tout unproven treatments for COVID-19. During a Fox News town hall event on May 3, 2020, the following exchange between Fox News host, Bret Baier, and President Trump took place:

Bret Baier: “You did talk a lot about hydroxychloroquine for a while.”

Mr. Trump: “I do. And I still do.”

Mr. Baier: “And there were some studies that came out that questioned the cardiac tie . . . but you stopped talking about it.”

Mr. Trump: “One study. One study. But there [were] studies that came out that say it’s very good, too.”¹⁷²

The comments were deemed misleading at the time because hundreds of studies were in the works, and a review of the clinical trials showed mixed results. Research later concluded that the data was insufficient to support using the two antivirals that Trump touted as treatments for COVID-19.¹⁷³ And, as of June 20, 2020, the NIH halted its clinical trial of hydroxychloroquine because it did not effectively treat COVID-19.¹⁷⁴

The fourth tactic that science denialists use is the creation of an impossible expectation of science—one which science could never possibly meet.¹⁷⁵ For example, those who oppose the scientific consensus about the cause of climate change point to the absence of accurate temperature measurements before the invention of the thermome-

171. See Matthew J. Hornsey et al., *Donald Trump and Vaccination: The Effect of Political Identity, Conspiracist Ideation and Presidential Tweets on Vaccine Hesitancy*, 88 J. EXP. PSYCH. May 2020, at 1, 7 <https://doi.org/10.1016/j.jesp.2019.103947>. The scientists conducted a scientific survey of 518 Americans who voted in the 2016 presidential election and found that Trump voters tended to be “more conservative” and more “conspiracy-minded.” *Id.* at 2. In their second study, another 316 Americans who voted in 2016 were randomly assigned to view Trump’s tweets about either golf or vaccines. After reading his vaccine-related tweets, Trump voters became more anti-vaxx. Michael Dimock & John Gramlich, *How America Changed During Donald Trump’s Presidency*, PEW RSCH. CTR. (Jan. 29, 2021), <https://www.pewresearch.org/2021/01/29/how-america-changed-during-donald-trumps-presidency/> [<https://perma.cc/A959-2FK4>]. Their conclusion was that Trump does not just reflect the views of his supporters; he still has the power to shape his supporters’ views. *Id.*

172. Remarks and a Question-and-Answer Session at a Fox News Virtual Town Hall, 2020 DAILY COMP. PRES. DOC. 8 (May 4, 2020) [<https://perma.cc/6LJY-DYPP>].

173. Linda Qiu, *Criticized on Virus, Trump Goes to His Playbook: Deflect, Reject and Minimize*, N.Y. TIMES (May 7, 2020), <https://www.nytimes.com/2020/05/07/us/politics/trump-coronavirus-fact-check.html> [<https://perma.cc/3BP2-3JTC>].

174. *NIH Halts Clinical Trial of Hydroxychloroquine*, NAT’L INST. HEALTH (June 20, 2020), <https://www.nih.gov/news-events/news-releases/nih-halts-clinical-trial-hydroxychloroquine> [<https://perma.cc/FMD3-TPAL>].

175. Diethelm & McKee, *supra* note 107, at 3.

ter.¹⁷⁶ Rejecting science can also come in the form of attacking the inherent uncertainty of mathematical models to reject the premise entirely.¹⁷⁷ Interestingly, Phillip Morris used this argument in the early 1990s to promote a new standard of acceptance for epidemiological data called Good Epidemiological Practice (“GEP”).¹⁷⁸ Under this standard, only epidemiological studies with an odds ratio of two or more (meaning a doubling of the risk to an exposed population) would be considered strong evidence of causation, thereby dismissing large bodies of research that did not meet this standard.¹⁷⁹ Epidemiologists did not agree with this approach, and Philip Morris scaled back its push for GEP, although British American Tobacco still uses it to refute the risk associated with second-hand smoke.¹⁸⁰ GEP is still alive despite opposition from epidemiologists. Arguably, GEP made its way into the judicial system in toxic tort cases like *Merrell Dow Pharmaceuticals v. Havner*¹⁸¹ as a so-called heightened application of the *Daubert* standard in determining the admissibility of expert testimony. *Havner* involved the increased risk of birth defects associated with a mother’s use of the controversial drug Bendectin.¹⁸² In rejecting the plaintiff’s expert testimony regarding the causal link between Bendectin and the plaintiff’s birth defects, the Supreme Court of Texas found “a rational basis for relating the requirement that there be more than a ‘doubling of the risk’ to . . . the more likely than not burden of proof.”¹⁸³ This reasoning has been criticized as ignoring the difficulty of estimating *individual* risk from *population-based* data.¹⁸⁴ While epidemiological (population-based) studies are extremely valuable in determining scientific causation, this categorical exclusion can preclude both courts and juries from utilizing evidence that scientists would consider valid under *Daubert* because judges excluding the evidence say the testimony is not really scientific.¹⁸⁵ This shows that anyone, including judges, can be uncomfortable with scientific uncertainty.

There are very few definite answers regarding causation, and scientists understand that uncertainty is inherent in science. The global cases of COVID-19 are in the millions, and reported deaths are in the six figures, but we still do not know the true rates of infection and

176. *Id.*

177. *Id.*

178. *Id.*

179. *Id.*

180. *Id.*

181. *Merrell Dow Pharms., Inc. v. Havner*, 953 S.W.2d 706, 717 (Tex. 1997).

182. *Id.* at 714.

183. *Id.* at 717.

184. Arthur H. Bryant & Alexander A. Reinert, *The Legal System’s Use of Epidemiology*, 87 JUDICATURE 12, 18 (2003).

185. *Id.* at 12.

mortality.¹⁸⁶ This type of uncertainty about facts, data, and numbers—called epistemic uncertainty—is caused by a lack of knowledge about the present.¹⁸⁷ Yet, this is what leads policymakers to avoid acknowledging the uncertainties.¹⁸⁸ Experts’ opinions can change based on new data that minimizes what was once uncertain.¹⁸⁹ Science deniers use this uncertainty to undermine credibility and candor of scientists.¹⁹⁰

For example, Dr. Anthony Fauci has been criticized on the mixed messaging on the wearing of face masks—particularly in the early days of the pandemic in late February and early March 2020.¹⁹¹ During that time, hospitals experienced severe shortages of personal protective equipment like masks and little was known about asymptomatic individuals who were spreading the virus.¹⁹² Experts like Dr. Fauci initially advised Americans against wearing masks, but later changed their messaging.¹⁹³ In an interview with 60 Minutes, Dr. Fauci explained, “When it became clear that the infection could be spread by asymptomatic carriers who don’t know they’re infected, that made it very clear that we had to strongly recommend masks.”¹⁹⁴ As Dr. Fauci began to step up his blunt warnings and comments about the federal government’s response to the pandemic, the Washington Post¹⁹⁵ and the New York Times¹⁹⁶ reported that the White House began to actively undermine Fauci’s messaging by circulating opposition-research-style materials about mistakes he made at the beginning, including the guidance on masks. In response, Dr. Fauci stated that he and other scientific experts were operating based on the data that they had on the disease at that time.¹⁹⁷ Scientific opinions and public health

186. Amy Harmon, *Why We Don’t Know the True Death Rate for Covid-19*, N.Y. TIMES, <https://www.nytimes.com/2020/04/17/us/coronavirus-death-rate.html> (Apr. 18, 2020) [<https://perma.cc/A2KT-MXRA>].

187. Siobhan Roberts, *Embracing the Uncertainties*, N.Y. TIMES (Apr. 7, 2020), <https://www.nytimes.com/2020/04/07/science/coronavirus-uncertainty-scientific-trust.html> [<https://perma.cc/B7BJ-U8DX>].

188. *Id.*

189. *Id.*

190. *See id.*

191. Grace Panetta, *Fauci Says He Doesn’t Regret Telling Americans Not to Wear Masks at the Beginning of the Pandemic*, BUS. INSIDER (July 16, 2020, 2:45 PM), <https://www.businessinsider.com/fauci-doesnt-regret-advising-against-masks-early-in-pandemic-2020-7> [<https://perma.cc/3VAV-FNXR>].

192. *Id.*

193. *Id.*

194. *Id.*

195. Yasmeeen Abutaleb, Josh Dawsey & Laurie McGinley, *Fauci Is Sidelined by the White House as He Steps Up Blunt Talk on Pandemic*, WASH. POST (July 11, 2020, 4:43 PM), <https://www.washingtonpost.com/politics/2020/07/11/fauci-trump-coronavirus/> [<https://perma.cc/5JMN-YNJD>].

196. Maggie Haberman, *Trump Aides Undercut Fauci as He Speaks Up on Virus Concerns*, N.Y. TIMES (July 12, 2020), <https://www.nytimes.com/2020/07/12/us/politics/fauci-trump-coronavirus.html> [<https://perma.cc/MVK8-9YCV>].

197. Panetta, *supra* note 191.

guidance should be data-driven, and Dr. Fauci acknowledged as such: “Our knowledge changed and our realization of the state of the outbreak changed.”¹⁹⁸

The fifth tool science denialists use includes use of misrepresentation and logical fallacies.¹⁹⁹ In other words, one can simply misrepresent the truth to make the facts easier to argue against.²⁰⁰ For example, in response to New York Governor Andrew Cuomo’s plea for federal assistance with ventilators, President Trump misleadingly claimed that Governor Cuomo rejected a 2015 recommendation to purchase 15,000 ventilators and instead “established death panels” and “lotteries.”²⁰¹ In the same vein, during an interview with ABC News on May 6, 2020, President Trump stated the following regarding the Strategic National Stockpile of medicines and medicinal products: “[D]on’t forget, the cupboard was bare. The other administration—the last administration left us nothing. We didn’t have ventilators, we didn’t have medical equipment, we didn’t have testing. The tests were broken. You saw that. We had broken tests.”²⁰² In truth, the stockpile contained more than \$7 billion in supplies when President Trump took office.²⁰³ The comment regarding broken tests did not add up as COVID-19 did not appear until late 2019, more than two years after Trump took office.²⁰⁴ The only botched tests appeared to be the COVID-19 tests initially designed by the CDC, which rejected a proven two-sequence test from the World Health Organization in favor of a more complex test it created, using three genetic sequences.²⁰⁵ The third sequence gave inconclusive results, causing a major setback in the CDC’s efforts to test and track the virus.²⁰⁶

The scientific process is not always perfect, but this type of rhetoric weaponizes it in a way that is detrimental to public health.²⁰⁷ In their identification of this common ploy, Dr. Diethelm and Dr. McKee have noted that denialists are not deterred by the extreme isolation of their theories; rather they see it as “intellectual courage against the dominant orthodoxy and the accompanying political correctness, often

198. *Id.*

199. Diethelm & McKee, *supra* note 107, at 3.

200. *See id.*

201. Robert Farley, *Trump’s Misleading Ventilator Counter-Punch at Cuomo*, FACTCHECK.ORG (Mar. 26, 2020), <https://www.factcheck.org/2020/03/trumps-misleading-ventilator-counter-punch-at-cuomo/> [<https://perma.cc/3UT2-AKAH>].

202. *Transcript: ABC News Anchor David Muir Interviews President Trump in Arizona*, ABC NEWS (May 6, 2020, 6:37 AM), <https://abcnews.go.com/Politics/transcript-abc-news-anchor-david-muir-interviews-president/story?id=70523003> [<https://perma.cc/KY4E-4267>].

203. Qiu, *supra* note 173.

204. *Id.*

205. Michael D. Shear et al., *The Lost Month: How a Failure to Test Blinded the U.S. to Covid-19*, N.Y. TIMES, <https://www.nytimes.com/2020/03/28/us/testing-coronavirus-pandemic.html> (Apr. 1, 2020) [<https://perma.cc/799N-8ZL7>].

206. *Id.*

207. *See* Diethelm & McKee, *supra* note 107, at 2.

comparing themselves to Galileo.”²⁰⁸ The tactics have become so commonplace on media platforms and among the public, which is illustrated in what has happened to scientists and public health experts in the wake of COVID-19. COVID-19 presents immediate consequences of the public’s decision to adhere to or ignore public health guidance. Historically, scientific concern surrounding environmental health issues has not gained the attention from the general public that it deserved because of the lack of public political concern.²⁰⁹ Before COVID-19, policymakers were refining these tactics in undermining environmental health with legislative and regulatory initiatives.

VI. SCIENCE DENIALISM AND CONSPIRACY THEORIES PERMEATE THE LEGISLATIVE AND EXECUTIVE BRANCHES

Rhetorical attacks on science are not limited to media outlets and individual politicians; attacks now permeate Washington with new anti-science policies and legislation, cloaked in words like “transparency” with a goal of outing “secret science.” The intersection between law, science, and politics has never been more evident than in recent years. The executive branch has been historically acknowledged and even legitimized through its expertise, which often forms the foundation of judicial deference and congressional delegation to administrative agencies.²¹⁰ What was once the turf of scientific expertise is now overrun with politics and fueled by anti-science rhetoric.²¹¹ Even agencies that have traditionally been known to strongly adhere to data and science have already begun to move away from science itself; even the Government Accountability Office and the Congressional Research Service have “employed tactics such as emphasizing uncertainty, weak language, and false equivalence to avoid making politically charged claims.”²¹² This, no doubt, represents a substantial increase in the politicization of science, which could lead to a diminished trust by the judiciary in the expertise of agencies.²¹³

Traditionally, law, science, and politics represented different paths to reaching conclusions and legitimizing decisions.²¹⁴ Law has represented our capacity to create binding principles to produce a fair and

208. *See id.* Ironically, as previously mentioned, Galileo based his observations on actual scientific observations, which was outside of the established norms set by the Catholic Church during that time. *Id.*

209. *See* Loughheed, *supra* note 162, at A107.

210. Nathan Taylor, *Can Legislative Expert Agencies Un-Bend Science?*, 29 *Geo. Env’t L. Rev.* 593, 595 (2017).

211. *See* Jori Reilly-Diakum, *Addressing Blurred Lines: Institutional Design Solutions to Transgression Across the Science-Policy Boundary*, 49 *Tex. Env’t L. Rev.* 199, 205–06 (2019).

212. *Id.*

213. *Id.*

214. *See* Peter H. Schuck, *Multi-Culturalism Redux: Science, Law, and Politics*, 11 *Yale L. & Pol’y Rev.* 1, 4 (1993).

just outcome.²¹⁵ Science utilizes technical and specialized expertise to generate and test hypotheses and is less interested in the outcome than in the actual process of discovery and knowledge.²¹⁶ Politics is the process of participation in making government decisions based on many factors, including societal views and the economy.²¹⁷ Scientific progress does not take place in a vacuum; it can only thrive with society's blessing.²¹⁸ Therefore, science is, in a way, governed by society and beholden to its political will.²¹⁹ However, most scientists are hesitant to associate science with politics because they believe the scientific method is there to minimize bias and maximize objectivity.²²⁰ Society, to a certain extent, does control whether scientific research is prioritized through its vote because ultimately, elected officials control the funding and therefore control a majority of federal grants or government-funded scientific pursuits.²²¹ Recently, this was demonstrated by President Trump's decision to halt NIH funding for the study of the emergence of coronavirus in bats; presidential preference plays a role in what is ultimately funded.²²² President Trump and the 115th Congress launched numerous attacks on climate science and scientists, including anti-science legislation, regulations and orders, censorship, restrictions on grants and funding, restricting data accessibility, and editing or restricting communications by scientists to the public.²²³

Federal agencies and Congress have a responsibility to act to ensure the government's response to COVID-19 is based on the best available science.²²⁴ Yet, former-President Trump erroneously downplayed the severity and nature of COVID-19²²⁵ touted unproven cures about

215. *Id.* at 4–5.

216. *Id.*

217. *See id.*

218. *Id.*

219. *Id.*

220. *Id.* at 17–18.

221. *See id.* at 20.

222. Nurith Aizenman, *Why the U.S. Government Stopped Funding a Research Project on Bats and Coronaviruses*, NPR (April 29, 2020, 3:08 PM), <https://www.npr.org/sections/goatsandsoda/2020/04/29/847948272/why-the-u-s-government-stopped-funding-a-research-project-on-bats-and-coronaviru> [<https://perma.cc/XW7N-N6S4>].

223. *Attacks on Science*, UNION CONCERNED SCIENTISTS, <https://www.ucsusa.org/resources/attacks-on-science> (Dec. 16, 2020) [<https://perma.cc/E9CB-P3JD>].

224. *Id.*

225. Quint Forgey, *Trump Floats His Own Coronavirus Hunches on 'Hannity'*, POLITICO, <https://www.politico.com/news/2020/03/05/trump-disputes-coronavirus-death-rate-121892> (Mar. 5, 2020, 10:23 AM) [<https://perma.cc/5HTB-DJJR>]. For example, in March 2020, when asked about the global mortality rate for coronavirus, Trump stated, “Well, I think the 3.4[%] is really a false number. Now, and this is just my hunch, and—but based on a lot of conversations with a lot of people that do this. Because a lot of people will have this and it's very mild. They'll get better very rapidly. They don't even see a doctor. They don't even call a doctor.” *Id.* In July 2020, President Trump dismissed the severity of the coronavirus, stating that while the testing had identified many cases in America, “99[%]” of them were “totally harmless.”

imminent cures and treatments that defied conventional science.²²⁶ And while misinformation about the virus spread, others have argued that the administration attempted to restrict public access to critical information about COVID-19.²²⁷ This is just the latest action in a series of events over the past four years that have unapologetically diminished science's role in federal policymaking in favor of regulatory reforms and boosting the economy.²²⁸ Political appointees have shut down government-funded studies and diminished scientists' roles in regulatory decision-making with little accountability.²²⁹ The often baseless rhetorical attacks on science, which predated President Trump's tenure, led to the push to "reform science." For example, the House Committee on Science, Space and Technology aimed to cut at least \$300 million from NASA's Earth science budget with its 2015 funding authorization bill.²³⁰ Believing that something secretive was

Roni Caryn Rabin & Chris Cameron, *Trump Falsely Claims '99 Percent' of Virus Cases Are 'Totally Harmless'*, N.Y. TIMES, <https://www.nytimes.com/2020/07/05/us/politics/trump-coronavirus-factcheck.html> (July 7, 2020) [<https://perma.cc/UGM7-CB9L>].

226. Allyson Chiu et al., *Trump Claims Controversial Comment About Injecting Disinfectants Was 'Sarcastic'*, WASH. POST (Apr 24, 2020, 12:49 PM) <https://www.washingtonpost.com/nation/2020/04/24/disinfectant-injection-coronavirus-trump/> [<https://perma.cc/5NKY-B8FD>]. On Thursday, April 23, 2020, Trump offered commentary after a presentation that mentioned disinfectants can kill the novel coronavirus. *Id.* Specifically, he said, "I see the disinfectant that knocks it out in a minute, one minute And is there a way we can do something like that by injection inside, or almost a cleaning? Because you see it gets inside the lungs and it does a tremendous number on the lungs, so it would be interesting to check that." *Id.* When asked the next day about his remarks, he said, "I was asking a question sarcastically to reporters like you just to see what would happen." *Id.*

227. Kashmiri Gander, *Coronavirus Cases Tested in U.S. Removed from CDC Website, According to Congressman: 'American People Deserve Answers'*, NEWSWEEK (Mar. 3, 2020, 4:44 AM), <https://www.newsweek.com/coronavirus-cases-tested-us-removed-cdc-website-according-congressman-american-people-1490158> [<https://perma.cc/9SNJ-XXZW>]. On Monday, March 2, 2020, Congressman Mark Pocan wrote to the CDC Director, Dr. Robert Redfield, asking why the national public health institute stopped reporting how many Americans had been tested for COVID-19. *Id.* And in July 2020, the Trump administration directed all hospitals to begin reporting COVID-19 data to a private contractor. Pien Huang & Selena Simmons-Duffin, *White House Strips CDC Of Data Collection Role For COVID-19 Hospitalizations*, NPR (July 15, 2020, 1:31 PM), <https://www.npr.org/sections/health-shots/2020/07/15/891351706/white-house-strips-cdc-of-data-collection-role-for-covid-19-hospitalizations> [<https://perma.cc/932F-UMQE>].

228. See Brad Plumer & Coral Davenport, *Science Under Attack: How Trump Is Sidelining Researchers and Their Work*, N.Y. TIMES (Dec. 28, 2019), <https://www.nytimes.com/2019/12/28/climate/trump-administration-war-on-science.html> [<https://perma.cc/A3XU-QT3E>]. "Businesses are finally being freed of Washington's overreach, and the American economy is flourishing as a result." *Id.*

229. Samuels, *supra* note 9; see also Jeff Tollefson, *How Trump Damaged Science — And Why It Could Take Decades to Recover*, NATURE, <https://www.nature.com/articles/d41586-020-02800-9> (Oct. 7, 2020) [<https://perma.cc/NC9D-QEK6>].

230. Phil Plait, *House GOP Wants to Eviscerate NASA Earth Sciences in New Budget*, SLATE (Apr. 30, 2015, 7:00 AM), <https://slate.com/technology/2015/04/nasa-budget-gop-committee-wants-to-slash-and-burn-earth-sciences.html> [<https://perma.cc/G2MK-NB2U>].

taking place, the committee chairman, Representative Lamar Smith (R-Texas), issued a congressional subpoena to the head of the National Oceanic and Atmospheric Agency (“NOAA”) to hand over data and emails from the NOAA’s scientists on their use of global satellite data.²³¹ Smith’s office released a statement confirming the conspiracy-laden, false beliefs that fueled the attack on the NOAA and his accusations of scientists “doctoring results”:

It was inconvenient for this administration that climate data has clearly showed no warming for the past two decades. The American people have every right to be suspicious when NOAA alters data to get the politically correct results they want and then refuses to reveal how those decisions were made. NOAA needs to come clean about why they altered the data to get the results they needed to advance this administration’s extreme climate change agenda. The agency has yet to identify any legal basis for withholding these documents. The Committee intends to use all tools at its disposal to undertake its Constitutionally-mandated oversight responsibilities.²³²

The push to “reform science” was a reformation according to political views, which has continued with attacks at the legislative level.

A. “Reforming” Science

Recently introduced legislation has furthered the science denialism but under the carefully crafted veil of reforming science. The proposals have not come from the scientific community; rather they have come from political appointees and congressmen who have drafted reforms largely without input or advice from the scientific community.²³³ These reforms aimed to limit the collection of underlying scientific data, thereby drastically changing the nature of scientists’ actual deliberations by constraining what they can use to perform their analysis.²³⁴ A perfect example of these restraints is the HONEST Act (H.R. 1430), introduced by Representative Smith and passed without amendment in 2017.²³⁵ Under the guise of section two, titled Data Transparency, the Act set out to limit the scientific data that would be considered in agency decision-making through the following language: “all scientific and technical information” must be “*publicly available online* in a manner that is sufficient for independent analysis

231. Phil Plait, *Update: Rep. Lamar Smith Ramps Up His Climate Conspiracy*, SLATE (Oct. 30, 2015, 9:30 AM), <https://slate.com/technology/2015/10/global-warming-lamar-smith-s-conspiracy-ideations.html> [https://perma.cc/VN44-ND5P].

232. *Id.*

233. Wendy Wagner, Elizabeth Fisher & Pasky Pascual, *Whose Science? A New Era in Regulatory “Science Wars”*, 362 SCIENCE 636, 638 (2018), <https://doi.org/10.1126/science.aau3205>.

234. *See id.*

235. HONEST Act, H.R. 1430, 115th Cong. (2017), <https://www.congress.gov/115/bills/hr1430/BILLS-115hr1430rfs.pdf> [https://perma.cc/72B4-KW5J].

and *substantial reproduction* of research” before that information can be used in the agency’s scientific analysis supporting a decision.²³⁶ While the language sounds harmless on its face, the language’s transparency element would have forced scientists to disclose confidential health information as well as trade secrets to comply.²³⁷ The effect of it arguably presented the EPA with a Hobson’s choice,²³⁸ where the Agency would have been forced to either ignore scientific information vital to protecting the public or require that the scientists disclose confidential health information.²³⁹ In opposing the bill, the non-profit group, Clean Water Action, was part of a group that wrote a letter to Congress, providing several examples of how this transparency requirement could play out:²⁴⁰

For example, many studies of the dangers of lead poisoning follow patients who have suffered from exposure, and those records would be legally required to be kept confidential. H.R. 1430 would force EPA to ignore key medical science and force the agency to forego safer health standards and more protective risk assessments because EPA may not disclose confidential information in violation of such laws and agreements.²⁴¹

Clean Water Action also illustrated a situation where the EPA could be prevented from appropriately responding to an emergency chemical spill.²⁴²

For example, when Freedom Industries spilled a chemical that contaminated drinking water in West Virginia, the studies on the chemical were not immediately disclosed and the raw data never was. Under this bill, EPA would not have been able to act absent such disclosures. The bill would prevent EPA from taking action because the agency would be barred from acting on the basis of confidential information. Also, the bill could allow industries to control EPA’s response by deciding selectively which information EPA may use to issue a health advisory or a risk or hazard assessment, by claiming that information to be confidential business information (CBI) subject to other statutory protections.²⁴³

236. *Id.* at 2 (emphasis added).

237. HR 1430 Opposition Letter, (Mar. 28, 2017), <https://www.cleanwateraction.org/sites/default/files/docs/publications/HR%201430%20Opposition%20Letter.pdf> [<https://perma.cc/5UQW-EAPW>].

238. A Hobson’s choice is “an apparently free choice when there is no real alternative” or “the necessity of accepting one of two or more equally objectionable alternatives.” *Hobson’s Choice*, MERRIAM-WEBSTER, <https://www.merriam-webster.com/dictionary/Hobson%27s%20choice> [<https://perma.cc/6HU7-FABC>].

239. HR 1430 Opposition Letter, *supra* note 237. Scientists have legally valid reasons for not disclosing information such as patients’ medical records, which are confidential and protected “under the Health Insurance Portability and Accountability Act (“HIPAA”) [and] other confidentiality laws or agreements.” *Id.*

240. *Id.*

241. *Id.*

242. *Id.*

243. *Id.*

Even more concerning is the effect of the term “substantial reproduction of research results.”²⁴⁴ It is unclear whether that particular language would have required that scientists reproduce the data, which is not considered necessary or even ethical in validating an epidemiological study.²⁴⁵ Scientists cannot ethically expose people to a dangerous chemical or virus; instead they must design a study around an already-occurring situation and rely on rigorous peer review.²⁴⁶ For example, epidemiologic data evidencing the spread of Zika, COVID-19, or any other zoonotic disease does not and should not be “reproduced” in order to validate the results before it can be trusted.²⁴⁷ In short, the Act would have hindered the use of valid scientific studies, thereby blocking public health initiatives and making agencies less capable of protecting the public.²⁴⁸

Although the misleading legislation eventually failed, records obtained by the New York Times included an agenda for a later meeting between Representative Smith and then-EPA Administrator Scott Pruitt, which stated that Smith’s “main objective for the meeting [was] to find a way to have EPA implement the HONEST Act objectives outside of the legislative process since it [was] unlikely to pass in the Senate.”²⁴⁹ A short time later, in 2019, the EPA released its proposed rule with another deceiving title, called *Strengthening Transparency in Regulatory Science*, requiring scientists to disclose all raw data and confidential medical records—eerily similar to the HONEST Act.²⁵⁰ The policy’s effect would have made it more difficult to enact new environmental rules because, again, many of the scientific studies detailing health effects associated with pollution were tied to personal health information gathered under confidentiality agreements.²⁵¹ These proposals illustrate concerted efforts at both the legislative and administrative level to weaken the use of science in policymaking. These attacks did not end with new policies or proposed legislation; they extended to publicly admonishing and chastising scientists who disagreed with political positions and blocking those scientists’ grants and travel to conferences to present their research.²⁵²

244. *Id.*

245. *Id.*

246. *Id.*

247. *See id.*

248. *Id.*

249. Ben Levitan, *Public Records Confirm EPA’s “Censored Science” Proposal Was an End-Run Around Congress*, ENV’T DEF. FUND (Nov. 12, 2019), <http://blogs.edf.org/climate411/2019/11/12/public-records-confirm-epas-censored-science-proposal-was-an-end-run-around-congress/> [<https://perma.cc/P6QU-B2R2>].

250. *Strengthening Transparency in Regulatory Science*, 85 Fed. Reg. 15396, 15401–03 (proposed Mar. 18, 2020) (to be codified at 40 C.F.R. § 30).

251. Lisa Friedman, *E.P.A. to Limit Science Used to Write Public Health Rules*, N.Y. TIMES (Nov. 11, 2019), <https://www.nytimes.com/2019/11/11/climate/epa-science-trump.html> [<https://perma.cc/J4G9-TQP7>].

252. *Id.*

B. *Censoring Science*

The executive branch has a long history of censoring and editing the science it officially publishes. It is not uncommon for a new administration to edit documents and refine testimony of its agency officials and scientists based on its policy objectives. For example, in 1989, the White House censored congressional testimony on the effects of global warming by Dr. James T. Hansen, one of the leading government scientists in the field.²⁵³ His original testimony, before it was changed, asserted that projections showed that manmade pollution caused global warming and warned of substantial temperature increases, drought, and severe storms.²⁵⁴ But before he could testify, the Office of Management and Budget changed it to make his conclusions seem less certain.²⁵⁵ Taking on a rhetorical tactic used by science denials, White House Press Secretary Marlin Fitzwater responded that it was changed to reflect that “there are many points of view on the global warming issue and many of them conflict with those stated by Dr. Hansen.”²⁵⁶ When appearing before the Senate Subcommittee on Science, Technology, and Space, Dr. Hansen said that he had been forced to make changes that raised speculation and questions about the reliability of the scientific evidence.²⁵⁷ In response to a question by then-Senator Al Gore, Dr. Hansen stated, “I don’t think science should be altered As a [g]overnment employee, I can and certainly do support [g]overnment policy. My only objection is changing the science.”²⁵⁸

Twenty years later, in June 2019, the White House similarly tried to halt a State Department senior intelligence analyst from discussing climate change science in his congressional testimony.²⁵⁹ Although the Georgetown professor was eventually able to testify to provide a summary of the written testimony, the White House refused to approve his testimony for entry into the permanent Congressional record because the science he cited did not reflect White House views.²⁶⁰ He resigned shortly thereafter as a direct result of the episode.²⁶¹

253. Philip Shabecoff, *White House Admits Censoring Testimony*, N.Y. TIMES (May 9, 1989), <https://www.nytimes.com/1989/05/09/science/white-house-admits-censoring-testimony.html> [<https://perma.cc/K3NT-NDSU>].

254. *Id.*

255. *Id.*

256. *Id.*

257. *Id.*

258. *Id.*

259. Lisa Friedman, *White House Tried to Stop Climate Science Testimony, Documents Show*, N.Y. TIMES (June 8, 2019), <https://www.nytimes.com/2019/06/08/climate/rod-schoonover-testimony.html> [<https://perma.cc/XE9L-7P3M>].

260. Coral Davenport, *State Dept. Intelligence Analyst Quits to Protest Blocked House Testimony*, N.Y. TIMES (July 10, 2019), <https://www.nytimes.com/2019/07/10/climate/rod-schoonover-resigns.html> [<https://perma.cc/29U2-8485>].

261. *Id.*

The censoring arguably extended to the public health guidance critical to the immediate threat of COVID-19 and the national debate over how soon children should return to in-person school in the fall of 2020. On July 8, 2020, the CDC wrote a sixty-nine-page guidance document marked “FOR INTERNAL USE ONLY,” detailing the risks and considerations schools should use in creating plans to reopen.²⁶² The document classified a full reopening of schools as the “highest risk,” and its suggestions included the expensive tasks of broad testing of students and faculty, as well as contact tracing.²⁶³ President Trump criticized these recommendations as “very tough and expensive.”²⁶⁴ Shortly thereafter, on July 24, 2020, the CDC issued new materials meant to supplement the guidance, titled *The Importance of Reopening America’s Schools this Fall*.²⁶⁵ Invoking a startlingly different tone, the document repeatedly described children as being “low risk” for COVID-19 infection or transmission, even though the science is not settled and recent studies indicate that children in middle and high school may be at a much higher risk of catching and transmitting the disease than those under age ten.²⁶⁶ Just one week before the materials’ release, the Trump administration stripped the CDC of its ability to collect and publish COVID-19 data by ordering hospitals to bypass the CDC and send patient data to a central database in Washington, D.C.²⁶⁷ The administration published this directive in a barely noticed document on the Department of Health and Human Services’ website.²⁶⁸ White House officials claimed that the change was meant to streamline data gathering, but the new database receiving the information was not open to the public.²⁶⁹ The concerns were that the administration could essentially censor the data prior to its release, and the change could affect the work of scientists, public health officials, and state and local government officials who rely on the data to make

262. CTRS. FOR DISEASE CONTROL & PREVENTION, CRAFT SCHOOLS BRIEFING PACKET (July 8, 2020), <https://int.nyt.com/data/documenthelper/7072-school-reopening-packet/b70172f2cc13c9cf0e6a/optimized/full.pdf#page=1> [<https://perma.cc/WJ48-3JJR>].

263. *Id.*

264. Abby Goodnough, *C.D.C. Calls on Schools to Reopen, Downplaying Health Risks*, N.Y. TIMES, <https://www.nytimes.com/2020/07/24/health/cdc-schools-coronavirus.html> (Feb. 12, 2021) [<https://perma.cc/5278-J97S>].

265. *Id.*

266. *Id.* The study of almost 65,000 people in South Korea suggests that school openings will trigger more outbreaks and that children between the ages of ten and nineteen can spread the virus at least as well as adults can. Young Joon Park et al., *Contact Tracing During Coronavirus Disease Outbreak, South Korea, 2020*, 26 EMERGING INFECTIOUS DISEASES 2465 (Oct. 2020), <https://doi.org/10.3201/eid2610.201315>.

267. Sheryl Gay Stolberg, *Trump Administration Strips C.D.C. of Control of Coronavirus Data*, N.Y. TIMES, <https://www.nytimes.com/2020/07/14/us/politics/trump-cdc-coronavirus.html> (Sept. 9, 2020) [<https://perma.cc/P3L9-F5XC>].

268. *Id.*

269. *Id.*

critical decisions about how to prevent the spread of COVID-19.²⁷⁰ Those moves alarmed public health experts who fear that the Trump administration would continue to politicize data and possibly withhold it from the public.²⁷¹

C. *Devaluing Scientific Expertise on Committees*

In addition to the censorship of data and anti-science legislation that has been introduced, the diminishment of science is also occurring on scientific advisory boards that play a critical role in advising agencies in rulemaking. “Since 2017, the EPA has [acted] to restrict certain academic scientists from sitting on its Science Advisory Board,” which is tasked with scrutinizing agency science.²⁷² Instead, the agency has replaced the scientists with an increased number of appointees who are connected with industry.²⁷³ This has resulted in an “exodus of expertise” from agencies like the EPA.²⁷⁴ While it is not unusual for administrations to routinely make changes based on new policy objectives, career scientists complain that it is different this time. A climate scientist with more than twenty years of experience at the EPA commented, “In the past, when we had an administration that was not very pro-environment, we could still lay low and do our work Now we feel like the [EPA] is being run by the fossil fuel industry . . . it feels like a wholesale attack.”²⁷⁵

There is a particular process by which scientists provide advice to members of the U.S. government, which takes place through scientific advisory committees.²⁷⁶ This system of scientific advisory committees plays a vital role in creating the federal government’s science policy.²⁷⁷ And many participants on these committees have stated that a variety of perspectives is the key to a successful panel.²⁷⁸ The 1972 Federal Advisory Committee Act (“FACA”) requires these advisory bodies “to be fairly balanced in terms of points of view represented and . . . not be inappropriately influenced by the appointing authority or by any special interest.”²⁷⁹ Agencies are also required to provide a description of their plan to attain fairly balanced membership during the charter-consultation process.²⁸⁰ FACA requires that federal advisory committees be balanced in the points of view of their members,

270. *Id.*

271. *Id.*

272. Plumer & Davenport, *supra* note 228.

273. *Id.*

274. *Id.*

275. *Id.*

276. Michaels et al., *supra* note 161, at 703.

277. *Id.*

278. *Id.*

279. Federal Advisory Committee Act of 1972, 5 U.S.C. app. §§ 1–116.

280. 41 C.F.R. § 102-3.30(c).

but each agency may balance at its discretion.²⁸¹ While FACA only offers guidance on how to achieve the balance by using factors like the geographic, ethnic, economic, or scientific impact of the committee's recommendations, it still requires all federal advisory committees to be balanced, regardless of whether they are discretionary or non-discretionary (statutory or Presidential committees).²⁸² Although the media and public rarely discuss scientific advisory committees, over 200 committees exist and their members—drawn from academia, government, industry, and non-profit organizations—serve without pay or with very modest stipends.²⁸³ Scientists understand that their role is critical to protecting the health of the public, yet seats on the advisory board have remained vacant.²⁸⁴ This underscores the power of both the executive and legislative branches in sidelining science despite legislative safeguards like FACA.

VII. SCIENCE DENIALISM HAS NO PLACE IN THE COURTROOM

Unlike the legislative and executive branches, the judicial branch has largely succeeded in both acknowledging the importance of expertise in administrative agencies²⁸⁵ and establishing rules by which experts are allowed to testify in the courtroom.²⁸⁶ The judiciary's respect and deference for expertise have arguably been more successful because of its insulation from politics, unlike members of Congress or administrative agencies who are subject to the White House's policy preferences. Scientists have long been called upon to testify as expert witnesses in courtrooms to help resolve technical questions and ultimately decide issues of fact.²⁸⁷ However, their presence was not always required in the courtroom.²⁸⁸ Historically, trials were resolved by a group of individuals with "knowledge of local affairs to decide notorious disputes."²⁸⁹ Over time, litigated matters became much

281. U.S. Gen. Servs. Admin. Comm. Mgmt. Secretariat, *Federal Advisory Committee Membership Balance Plan*, GEN. SERVS. ADMIN. (Jan. 2011), https://www.gsa.gov/cdnstatic/MembershipBalancePlanGuidance-November_2011.pdf [<https://perma.cc/Z3H9-62T9>].

282. *Id.* at 2.

283. *See Attacks on Science*, *supra* note 223.

284. *See Scientific Integrity of Federal Advisory Committees: Recommendations for 2021 and Beyond*, UNION CONCERNED SCIENTISTS (Sept. 2020), <https://www.ucsus.org/sites/default/files/2020-09/si-of-federal-advisory-committees.pdf> [<https://perma.cc/YEK7-3XWQ>].

285. *See, e.g.*, *Chevron U.S.A., Inc. v. Nat. Res. Def. Council, Inc.*, 467 U.S. 837, 865 (1984).

286. *See, e.g.*, *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579, 589 (1993) (asserting limits on trial judges per federal evidentiary rules).

287. *See* FED. R. EVID. 702.

288. *See* NAT'L ACADS. PRESS, *THE AGE OF EXPERT TESTIMONY: SCIENCE IN THE COURTROOM: REPORT OF A WORKSHOP* (2002) (discussing society's increasing dependence on such testimony).

289. Ronald J. Allen, *Expertise and the Daubert Decision*, 84 J. CRIM. L. & CRIMINOLOGY 1157, 1157 (1994).

more complex, and the gap of knowledge that was created really necessitated the testimony of an expert to assist the jury in its findings.²⁹⁰ An expert witness would only be allowed to testify if he or she was qualified by knowledge, skill, experience, training, or education,²⁹¹ and the testimony would “assist the trier of fact . . . to determine a fact in issue.”²⁹² There are safety nets built into a trial that allow the jury to hear from qualified experts who base their opinion on a body of science that has indicia of reliability. Therefore, the judicial system has acknowledged the importance of establishing a witness’s expertise so that jurors may rely on the testimony.²⁹³

The path to establishing an expert’s credibility in the courtroom has not been a perfect one. The trajectory of rhetoric that led up to the Supreme Court’s decision in *Daubert* is worth mentioning because the rhetoric was, in essence, a veiled attempt at sidelining science to align with conservative views of the necessity for tort reform. *Daubert*’s legacy, however, is that the jury has largely been insulated from conspiracy theories and fake experts. Before *Daubert*, toxic tort litigation had exponentially gained a foothold in civil litigation, with some calling it an “epidemic,” resulting in large payouts and loud complaints from industry and businesses.²⁹⁴ During that time, the new term “junk science” was used to describe the expert testimony in toxic tort trials and strongly denounced in Peter Huber’s book, *Galileo’s Revenge*.²⁹⁵ One of the primary examples that many believed epitomized the rise of junk science was the silicone breast implant litigation in the early 1990s, when thousands of plaintiffs filed cases, leading to the eventual \$4.75 billion settlement from implant manufacturers.²⁹⁶ The primary complaint of those attacking this litigation was that of questionable testimony by experts, particularly regarding medical causation.²⁹⁷ While many cases did present legitimate science, “junk science” became the rallying cry of conservative policy-makers, lawyers, and even the media.²⁹⁸ Then-Vice President Dan Quayle became one of the most outspoken critics of how courts utilized scientific evidence, proclaiming: the “uncontrolled use of expert witnesses . . . has allowed

290. *See id.* at 1168.

291. *Id.*

292. *Daubert*, 509 U.S. at 588.

293. Ric Simmons, *Conquering the Province of the Jury: Expert Testimony and the Professionalization of Fact-Finding*, 74 U. CIN. L. REV. 1013, 1028–29 (2006).

294. Jim Hilbert, *The Disappointing History of Science in the Courtroom*, Frye, *Daubert, and the Ongoing Crisis of “Junk Science” in Criminal Trials*, 71 OKLA. L. REV. 759, 774 (2019).

295. *See* PETER W. HUBER, *GALILEO’S REVENGE: JUNK SCIENCE IN THE COURTROOM 2* (1991). Huber worked for, “the Manhattan Institute, a conservative think-tank supported by various industry and insurance groups.” Gary Edmond & David Mercer, *Trashing “Junk Science”*, 1998 STAN. TECH. L. REV. 2, 3 (1998).

296. Hilbert, *supra* note 294, at 775–76 (2019).

297. *See id.* at 775.

298. *Id.* at 777.

'junk science' to tarnish the legal process."²⁹⁹ Building on the momentum, the 1992 Republican platform even promised to "throw out 'junk science' from American courtrooms."³⁰⁰

Despite this heavily used mantra, a Carnegie Commission report on Science, Technology, and Government concluded that "as for the allegations that 'junk science' is flooding the courtroom, many of the concerns are greatly exaggerated and it does not appear that federal courts are being inundated with fringe science."³⁰¹ Using "junk science" as a term to encourage reform of the mass tort suits was later criticized for a number of reasons. Junk science advocates often questioned motives of legitimate scientists and argued that huge financial stakes in litigation subverted scientists' values.³⁰² Professors Gary Edmond and David Mercer characterized the label "junk scientists" and the attacks on experts' motivations as highly asymmetrical, given that they largely ignored many examples where industry-sponsored scientists participated in the same mass tort litigation.³⁰³ As science in the courtroom increasingly became politicized, the Supreme Court stepped in with its decision in *Daubert* in 1993.³⁰⁴

The *Daubert* Court solidified the importance of expert witnesses in a trial and further established a standard for the admissibility of expert testimony.³⁰⁵ In applying the new evidentiary standard, the Court saddled judges with a gatekeeping role and a set of four flexible factors to judge the expert testimony.³⁰⁶ Trial judges had to judge the admissibility based on the following: (1) "whether a theory or technique . . . can be (and has been) tested"; (2) "whether the theory or technique has been subjected to peer review and publication"; (3) "[i]n the case of a particular scientific technique . . . the known or potential rate of error"; and (4) a scientific technique's "degree of acceptance within [a relevant scientific] community."³⁰⁷ Essentially, the district court judge acts as a gatekeeper by utilizing the aforementioned factors and making a preliminary assessment of whether the methodology and reasoning underlying the proposed testimony are valid.³⁰⁸ Second, the court must determine whether the evidence is relevant or would assist the trier of fact in understanding the evidence or determining a fact at issue in the case.³⁰⁹

299. *Id.*; Dan Quayle, *Civil Justice Reform*, 41 AM. U. L. REV. 559, 565 (1992).

300. Hilbert, *supra* note 294, at 778; Jeff L. Lewin, *Calabresi's Revenge? Junk Science in the Work of Peter Huber*, 21 HOFSTRA L. REV. 183, 185 (1992).

301. Hilbert, *supra* note 294, at 779.

302. Edmond & Mercer, *supra* note 295, at 2.

303. *Id.* at 24.

304. *Daubert v. Merrell Dow Pharms., Inc.*, 509 U.S. 579 (1993).

305. *Id.*

306. *See id.* at 593.

307. *Id.* at 593-94.

308. Allan Kanner & M. Ryan Casey, *Daubert and the Disappearing Jury Trial*, 69 U. PITT. L. REV. 283, 289 (2007).

309. *Id.*

There have been many criticisms of the judiciary's application of *Daubert*.³¹⁰ In fact, some judges have used very narrow interpretations of *Daubert* to exclude peer-reviewed, accepted methodology in toxic tort cases. *Castellow v. Chevron USA* is an example of the extreme fashion in which judges have applied *Daubert* to exclude testimony. In *Castellow*, a deceased gas station attendant's wife and daughter brought suit against the employer, alleging that their father's exposure to benzene resulted in his acute myelogenous leukemia and resulting death.³¹¹ The court rejected the expert testimony that relied on "modeling"³¹² to establish the plaintiff's lifetime benzene exposure and stated that "the court is not persuaded that the record supports that assertion [of causation] when modeling is used to justify causation opinions in a tort claim."³¹³ Similarly, in *Chambers v. Exxon Corp.*, a Louisiana judge excluded expert testimony in a case where an oil refinery worker, who was exposed to benzene, developed a very rare form of cancer called chronic myelogenous leukemia ("CML").³¹⁴ The plaintiffs employed the former Director of the Office of Standards Review at the Occupational Safety and Health Administration, who penned a 1977 study concluding that benzene caused CML.³¹⁵ The judge excluded the expert and dismissed the case, concluding that the plaintiffs did not offer a specific epidemiological study that conclusively established a statistically significant risk that benzene caused CML.³¹⁶ The specific type of study, or "good science," that the judge was searching for did not exist because CML is so rare and there had never been workers from the plaintiffs' profession who were diagnosed with CML.³¹⁷ So in the end, reliable scientific expert testimony was arguably excluded because the perfect study did not exist.³¹⁸

Some courts may have restricted *Daubert* out of fear that a jury would not consider the evidence in a fair manner, given the nature of the injury or the consequences of holding a company liable.³¹⁹ What has been more concerning for some academics is that jurors have said that interpreting testimony of science and technical evidence is partic-

310. *See id.* Kanner and Casey wrote that judges have many incentives to prevent a case from going to trial and could use just one of the factors or criteria unevenly to prevent expert testimony—oftentimes central to the plaintiff's case—resulting in summary judgment. *Id.* at 306.

311. *Castellow v. Chevron USA*, 97 F. Supp. 2d 780, 782 (S.D. Tex. 2000).

312. *Id.* at 789. Plaintiffs produced a publication by the American Industrial Hygiene Association ("AIHA") that advocated for this type of modeling. *Id.*

313. *Id.* at 786, 789.

314. *Chambers v. Exxon Corp.*, 81 F. Supp. 2d 661, 663 (M.D. La. 2000).

315. *Id.* at 664.

316. *Id.*

317. *See id.* at 644 n.3.

318. *See id.* at 665.

319. Leslie A. Lunney, *Protecting Juries from Themselves: Restricting the Admission of Expert Testimony in Toxic Tort Cases*, 48 SMU L. REV. 103, 167 (1994).

ularly challenging.³²⁰ However, there is still a consensus among academics that the difficulties that juries have with complex evidence has not significantly contributed to unreasonable verdicts.³²¹ Average jurors can understand enough of the testimony to engage in rational decision making once the testimony has been established as credible and reliable.³²² This concept relates to the fight against science denialism because the general public can understand science if credible experts present it in an accurate and relatable way. This can be accomplished if scientists and advocates of science, whether they be academic institutions or even lawyers, actively employ rhetorical tools that perform the functions of a gatekeeping role with the ultimate goal of restoring trust in science.

VIII. FIGHTING SCIENCE DENIALISM

Society does not have a judge to act as a gatekeeper to determine an expert's credibility or information's reliability presented through social media and politicians. Science denialism will continue to permeate through all government levels and policies regarding climate change, and the public's opinion of science will largely affect responses to pandemics like COVID-19. While education and dissemination of accurate information is of the utmost priority and should be undertaken on a global scale and emphasized in local communities, we need more than traditional educational measures that do not typically reach beyond scientifically literate groups. Additionally, we cannot simply hope for legislative changes that advocate for more peer review, standards, and audits. It is not enough to suggest changes to the structure of a law like the FACA or systems for the management of scientific information within agencies like the EPA. Nor is it feasible to simply recommend a *Daubert*-like approach for agencies in vetting scientific information. While those recommendations certainly have merit, the likelihood of those changes ever occurring are entirely dependent upon whom the public elects into office, and the elected official's own beliefs in conspiracy theories about science.

Further, we can no longer ignore the playbook of science denialists. To effectively combat the war on science, we must engage in advocacy and techniques designed to call out science denialism when it oc-

320. See Joe S. Cecil, Valerie P. Hans & Elizabeth C. Wiggins, *Citizen Comprehension of Difficult Issues: Lessons from Civil Jury Trials*, 40 AM. U. L. REV. 727, 728–29 (1991). For example, statistical evidence and DNA evidence with statistical arguments and inferences can be particularly challenging for jurors. See David Kaye et al., *Statistics in the Jury Box: How Jurors Respond to Mitochondrial DNA Match Probabilities*, 4 J. EMPIRICAL LEGAL STUD. 797, 798 (2007).

321. See Theodore Eisenberg et al., *Judge-Jury Agreement in Criminal Cases: A Partial Replication of Kalven and Zeisel's The American Jury*, 2 J. EMPIRICAL LEGAL STUD. 171, 190–92 (2005).

322. Valerie P. Hans, *Judges, Juries, and Scientific Evidence*, 16 J.L. & POL'Y 19, 25 (2007).

curr.³²³ A court would never allow a juror to step into the shoes of an expert witness to decide a case, nor would it allow a juror to give equal weight to a lay witness and expert witness when deciding an issue that requires expertise and evidence-based opinions. The consequences of allowing this to happen during a trial would unfairly prejudice the parties involved and ultimately do harm. In essence, a court realizes how a jury's reliance on false data or a disbelief in science could result in a severely unjust result. Why, then, would we continue to allow the same mistrust and substitution in judgment to happen in society-at-large when they ultimately decide who will represent them in Congress or as President, both of whom dictate how science will inform policy? COVID-19 is a harsh reminder of how sidelining science produces an unjust and irreversible result for the greater good. Holding science deniers accountable is the first step to changing this culture.

Science advocacy must first take place at the community level by reaching the individuals who are skeptical or unsure of expertise because public opinion shapes what our elected officials do. The public must be willing to consider and adapt to new and changing evidence and can do so with a trusted advisor delivering the information.³²⁴ The "trusted advisor" may not only be an actual expert, but rather a trusted family member or friend who can show empathy while asking the individual to test the conspiracy theory through a logical set of questions or a simple form of gatekeeping. While social media companies have recently tried to do more to label conspiracy theories or limit their spread, they do not necessarily have the scientific expertise to litigate what is or is not true; the sheer volume of material makes it nearly impossible to monitor.³²⁵ It is ultimately up to the public to identify these theories and ask: (1) is it rational, (2) do a group of credible experts agree with it, or is it a single source making an outlandish claim, and (3) how plausible (and logical) is it, really?³²⁶

Scientists and the academic institutions that support them also have an obligation to recognize science denialism and speak out against it because the public is starving for the truth. A recent study published in March 2020 in the Proceedings of the National Academy of Sciences looked at what happens when scientists tackle the science head-on and acknowledged the uncertainties.³²⁷ "The accusations of a post-truth society, and claims that the public 'had had enough of experts,' prompted us to investigate whether trust in 'experts' was lowered by

323. See generally Plumer & Davenport, *supra* note 228.

324. See generally *id.*

325. LastWeek Tonight, *supra* note 21.

326. *Id.*

327. See Anne Marthe van der Bles et al., *The Effects of Communicating Uncertainty on Public Trust in Facts and Numbers*, 117 PROC. NAT'L ACAD. SCIS. 7672 (2020), <https://doi.org/10.1073/pnas.1913678117>.

their openly admitting uncertainty about what they know.”³²⁸ The researchers found little evidence to suggest that scientists or policymakers communicating numerical uncertainty about measurable facts and numbers backfires or elicits a negative psychological response from the public.³²⁹ The results indicated that people “can handle the truth” about the level of certainty or uncertainty of scientific facts and knowledge.³³⁰ The researchers also suggest that a key challenge to maintaining public trust in science is for the communicators—whether they are scientists or other government officials—to be honest and transparent about the numbers and the limitations of the current state of knowledge.³³¹ Scientists like Dr. Fauci have tried to do just that.³³² This communication method can directly combat many of the tactics used to sideline science.

Both the legal and scientific professions should also be concerned with simply letting the lies percolate. Ultimately, the lies damage the credibility of both professions, which rely on public trust. Both professions could proactively use rhetorical tools to combat science denialism. Rhetorical tools are an innate courtroom skill for a lawyer, albeit somewhat foreign to the field of science. Scientists will need effective rebuttal strategies as opposed to simply not responding to science deniers.³³³ In fact, a 2019 study of effective rebuttal strategies to science deniers revealed that not responding actually has a negative effect on attitudes towards actions that are backed by science such as vaccination.³³⁴ Simply providing facts or exposing the typical science denialism techniques had positive effects.³³⁵

Conveying the importance and meaning of scientific research to the public should also involve the tools of persuasion, even though the premise seems contradictory to the goals of science.³³⁶ While scientists conduct their research in laboratories, which can be a solitary endeavor, communicating the results to the public is a social activity that centers on answering challenging questions.³³⁷ The public must accept the scientist’s answer, or proposition, until scientific progress dictates another proposition.³³⁸ In other words, scientists must convey that answers will change with advances in science and convince the public to accept their findings and the conclusions drawn from them *for now*,

328. Roberts, *supra* note 187.

329. van der Bles, *supra* note 327, at 7680.

330. *Id.*

331. *Id.*

332. Roberts, *supra* note 187.

333. Philipp Schmid & Cornelia Betsch, *Effective Strategies for Rebutting Science Denialism in Public Discussions*, 3 NATURE HUM. BEHAV. 931 (2019), <https://doi.org/10.1038/s41562-019-0632-4>.

334. *See, e.g., id.*

335. *Id.* at 312.

336. Varpio, *supra* note 108.

337. *Id.*

338. *Id.*

but not *forever* given science's dynamic nature.³³⁹ Aristotle's tools of persuasion apply here. Ethos, or the credibility or trustworthiness of scientists, should be emphasized by advocates of science when debunking the anti-science rhetoric that is often hurled at well-respected scientists.³⁴⁰ Much of a scientist's ethos lies not only in his or her reputation, but in the ability to present well-reasoned and justified research methodologies.³⁴¹ Agency scientists should be able to present an unaltered version of any scientific findings that fuel policy decisions through an independent portal, making it available for other scientists and the public to review—a true measure of transparency. And when academic scientists are attacked, universities and academic institutions should take a strong stance against the anti-science rhetoric and issue public statements in support of their scientists. More importantly, a scientist's methodologies and opinions must actually be understood by the audience. Rhetorical techniques including *similitude*, using pronouns like *we* and *us*, appeal to the similarity between all of us and reinforce that the commonality between experts and the public.³⁴² Consider the following two sentences:

While COVID-19 numbers continue to rise in *our* communities, *we* owe it to *our* residents to continue to deliver up-to-date science that will help inform decision-making.

versus:

While COVID-19 numbers continue to rise in communities, scientists owe it to residents to continue to deliver up-to-date science that will help inform decision-making.

One creates social connection and the other creates social distance.³⁴³ Connectedness creates trust, a key tenet of persuasion through ethos. Logos is also critical in the fight against science denialism because it appeals to an audience's rationality and depends on the scientist's ability to map out the evidence and how it leads to a conclusion being drawn.³⁴⁴ The persuasion of logos, however, is not limited to the argument's actual logic; it is most effective when the audience can follow the logic behind the conclusion or the advice. Finally, pathos holds immense power in that it focuses entirely on the audience. The ability of science denialists to play upon the public's emotions, especially during a time of crisis, is particularly effective when it comes to selling conspiracy theories. Advocates of expertise and science must seek out the audience's attention and create a desire within them to listen. Using powerful language and words that are "the ultimates of motivation" will embody principles and values that carry

339. *Id.*

340. *See id.* at 207–08.

341. *Id.* at 207.

342. *Id.* at 207–08.

343. *Id.* at 208.

344. *Id.*

emotional meaning and substance for the public.³⁴⁵ Words like *freedom*, *justice*, *patriotic*, and *duty* call on values that most Americans share, trumping contradictory feelings of fear, anxiety, and distrust.³⁴⁶ Tapping into the audience's sense of responsibility in supporting evidence-based efforts to fight COVID-19 and climate change contributes to the goal of a community-based information campaign to change how science and experts are viewed.

IX. CONCLUSION

Science denialism and the spread of misinformation have damaged the public perception of scientific expertise, affecting the funding and voice of many of our scientists who are best equipped to guide us in this endeavor. During the COVID-19 pandemic, science denialism has been detrimental to communicating protective measures necessary to reduce the number of new COVID-19 cases.³⁴⁷ Future pandemics will likely happen; it is just a matter of time.³⁴⁸ And scientific uncertainty will inevitably be exploited for political gain and used in misinformation and disinformation campaigns, making it that much more important to confront it head on.³⁴⁹ Those who are united by a common interest in effectively communicating the truth in a post-truth world must create a system to allow this to happen. Holding science deniers accountable and employing rhetorical tools as a method of gatekeeping in society is the first step to changing this culture.

345. *See id.* at 209.

346. *Id.*

347. Evstatieva, *supra* note 127.

348. Frutos et al., *supra* note 55.

349. *See* Plumer & Davenport, *supra* note 228.

