

The Governmental Fight Against Mis- and Disinformation During a Worldwide Health Crisis: What Ethical and Moral Lessons Can We Learn From COVID-19 Policies?

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ABSTRACT

Fighting mis- and disinformation has become a focus for national governments and international organizations. Both forms of false information can fuel distrust in governments and undermine support for their policies. Right after the COVID-19 pandemic was declared, the World Health Organization (WHO) warned that disinformation was swamping social media. Many governments pressured social media companies to remove online content, and scientists speaking out in their own fields of research were censored. This article investigates three case studies of so called ‘disinformation’, and finds that for the origin of the virus (the lab leak hypothesis), aerosol spread and face masks, that valid and correct scientific content was suppressed at scale. In some cases authorities later recognized that this was unjustified, in others this is not (yet) the case. The removal or suppression of information has legal and moral aspects, and impacts trust in public authorities. Free speech is a fundamental human right and underpins democracy. In censoring scientific viewpoints, there is also the question whether governments should be the arbiter of truth. Science revolves around hypotheses, healthy skepticism and debate, and governments declaring hypotheses, data or viewpoints as ‘false’, can stifle both academic progress and medical and political debate, as well as negatively impact policy-making, trust and societal resilience.

1.0 INTRODUCTION

Fighting mis- and disinformation has become a focus for national governments and international organizations. Both NATO and the EU recognize mis- and disinformation as a serious threat. These forms of false information can fuel distrust in governments, undermine support for their policies and contribute to the further polarization of societies. Both Russia and China have been accused by the West of spreading disinformation, with the NATO Summit Communiqués of Madrid, Vilnius and Washington all devoting attention to the topic. In the discipline of international relations, and in broader scientific discourse, much attention is given to how autocratic nations use mis- and disinformation to manipulate the public debate in the West. This article focuses on the governmental fight against mis- and disinformation during COVID-19. During COVID-19, governments worldwide considered the fight against mis- and disinformation as an essential part of crisis management. Since then, governments have argued that the threat of mis- and disinformation has not abated, with EU Commission President Ursula von der Leyen noting that it is *the* top global concern, even above conflict and climate change (Leyen, 2024).

In a speech at the Munich Security Conference in February 2020, the director general of the World Health Organisation (WHO) issued a stark warning: “we’re not just fighting an epidemic; we’re fighting an infodemic. Fake news spreads faster and more easily than the virus, and is just as dangerous.” (Adhanom, 2020). Barely a month later, on 11 March 2020, the WHO declared COVID-19 a global pandemic (Boseley, 2020). In the following years, the WHO issued many statements on the characteristics of the virus, the policies required to ‘stop the spread’, and the effectiveness of those measures. These statements became the key sources of reference for governments, fact checkers and the media. Doctors and scientists who doubted or contradicted these, or spoke against government policies, were often accused of spreading

mis- and disinformation. Under significant political pressure, the major social media platforms like Facebook, Twitter, YouTube and LinkedIn implemented policies to fight mis- and disinformation. On their platforms, content classified as mis- and disinformation was removed, warnings were added to posts (or referrals to the WHO statement on the matter), and people lost their accounts or were banned from the sites if they continued to share their views and expertise.

The scope of this so called ‘content moderation’ was enormous. In August 2021, Facebook stated that it had removed more than 20 million COVID-19 related posts, and that it had added information labels to another 190 million posts that fact checkers had deemed false (Nix and Wagner, 2021). By September 2021, YouTube had taken down 1 million videos that had spread so called ‘COVID-falsehoods’ (Milmo, 2021). Amongst the victims of this censorship were virologists, epidemiologists and vaccinologists – all speaking out in their own fields of research. What was labelled misinformation or a conspiracy and censored, was in many cases a valid hypothesis supported by empirical evidence. During COVID-19, many governments enacted stringent policy measures that infringed on fundamental human rights as well as people’s wellbeing, and which had enormous economical and societal impact.

At the time, it was argued that ‘the science’ provided the arguments for these measures, even though scientific debate was impeded and dissenting voices were silenced. This article will illustrate how censorship affected three areas of scientific research on COVID-19 and its effects, namely the lab leak hypothesis, aerosol spread and the effectiveness of masks as medical protection measure. In each case, so called ‘scientific consensus’ was declared by the WHO, governments, the media and a faction of scientists on a particular statement for which the evidence was very limited or lacking, while all dissenting (scientific) viewpoints were ridiculed and censored.

The objective of this article is to provide a first overview of different aspects of the governmental fight against mis- and disinformation during COVID-19, and to evaluate the impact of these policies. Five research questions will be addressed:

- 1) What kind of information was censored during the COVID-19 crisis?
- 2) What was the impact of the ‘mis- and disinformation’ policies on the scientific process?
- 3) What was the psychosocial impact of the ‘mis- and disinformation’ policies?
- 4) Was the online censorship during COVID-19 meaningful, and within ethical norms?
- 5) What lessons can we learn from censorship during COVID-19?

The analysis will be limited to the period between the WHO declaration of a public health emergency of international concern on 30 January 2020, up to the declared end of the public health emergency on 5 May 2023. After a brief introduction on the terms censorship, mis- and disinformation, three case studies will be described (origin of the virus, the transmission route and face masks). There are more areas where extensive censorship took place, such as early treatments and vaccines, but these are not covered in this piece. Primary source material – the content moderation policy guidelines of five social media companies and search engines (Facebook, Twitter, YouTube, Google, and LinkedIn) were matched with specific examples of censorship in Europe and the United States. The focus is on censorship and its effects, not why and how certain COVID-19 policies were enacted. The article is especially relevant for future disinformation and crisis management studies, as many posts during COVID were flagged for removal by Artificial Intelligence (AI). Once a certain ‘truth’, by the judgement of an unknown ‘fact-checker’, had been fed into algorithms, similar dissenting opinions by experts and even politicians were automatically removed at large scale (Perry, 2020).

2.0 MIS- AND DISINFORMATION AND CENSORSHIP

Much research has been conducted on mis- and disinformation, but the definitions underpinning the concept are not always clear. The term ‘fake news’, popularized during Trump’s presidency, has itself become politicized, and is imprecise in its boundaries. This article will therefore avoid this term. In 2018 Dictionary.Com chose ‘misinformation’ as the word of the year, defining it as “false information that is spread, regardless of whether there is intent to mislead.” (Strauss, 2018). The difference between disinformation is the intent: here the disseminator is aware that the information is false and has the goal of misleading the other. While there are many granular definitions of disinformation, the European Union High Level Group on Fake News and Disinformation, has a definition that is practical to use. It argues that it encompasses “all forms of false, inaccurate, or misleading information designed, presented and promoted to intentionally cause public harm or for profit.” (Directorate-General for Communications Networks, 2018, p. 11). The European Commission, in turn, has further sharpened the definition: “verifiably false or misleading information that is created, presented and disseminated for economic gain or to intentionally deceive the public, and may cause public harm” (*Tackling online disinformation: a European Approach*, 2018, p. 3,4). Both definitions exclude illegal content and forms of deliberate but not misleading distortions of facts such as parody and satire. The term is actor agnostic, and mis- or disinformation can be disseminated by a government, other organization or individual.

Countering disinformation is a complex undertaking. First, to meet the definitional criteria, it must be determined that the information in question is verifiably false, that the purveyor was aware of this and had the intent to cause harm. According to scientist Jason Pielemeier, efforts can then be grouped around five categories: 1) limiting the reach of false news/information, 2) demonetization, 3) addressing inauthentic behavior 4) contextualization 5) transparency (when removing content) (Pielemeier, 2020). The first and last category – actively suppressing or removing content – moves into the realm of censorship. From a broad perspective, censorship concerns the suppression of communication (writing, images, videos) that is deemed offensive, harmful or a threat to security – for political, religious or cultural reasons (Green and Karolides, 2014). It is a normative term, indicating repression and a limitation of the freedom of speech; one of the fundamental human rights underpinning a functioning and inclusive democracy, where diverse views are embraced and not discriminated against.

Autocracies are known for censoring the media, but democracies have also censored debate especially in times of war. During the First and Second World War all powers controlled their own media, with national security defining the outer boundaries of debate. Interestingly, in March 2020 several governmental leaders declared war against the coronavirus (Erlanger, 2020). Research has found that leaders of nations that censor certain topics cannot resist the temptation to broaden the scope of their censorship and also target the opposition (Deibert, 2010). There are also similarities between the war against COVID-19 and the West’s fight against terrorism – notably the Islamic State (ISIS), where the target was ‘terrorist propaganda’ and not ‘disinformation’. Significant political pressure was exerted on social media companies, with both President Obama and UK’s prime-minister Cameron calling on Facebook and Twitter to do more to restrict ‘terrorist use’ of their platforms. Whether it involved the UK riots of 2001, terrorist attacks in Europe or the storming of the Capital in 2021, the political reaction to each was to chide social media for their role in the event and to threaten with more strict legislation. In general, research on censorship is complicated by the fact that governments do not announce what they censor. Censorship also has a chilling effect, and the most pernicious form of censorship, namely self-censorship, is difficult to measure (Gibson and Sutherland, 2023).

2.1 Origin of the Virus

The parameters of the scientific debate on the origin of the virus were quickly set by two articles. One was a letter of support signed by 27 scientists in the journal the Lancet on 19 February 2020. It was titled ‘A statement in support of the scientists, public health professionals, and medical professionals of China combatting COVID19’. The other concerned a correspondence to the editor called ‘the Proximal Origins of

SARS-COV-2' in Nature Medicine, published 17 March 2020 (Andersen *et al.*, 2020). Journal Nature initially rejected the paper because it didn't sufficiently downplay the lab leak theory. The co-authors amended their paper to include stronger language that would unequivocally rule out the lab-leak hypothesis to ensure approval by Nature Medicine (*Wenstrup Releases Alarming New Report on "Proximal Origin" Authors, NIH Suppression of the COVID-19 Lab Leak Hypothesis*, 2023). The paper in Nature Medicine was already published online on 17 February, so it appeared ahead of the letter of support in the Lancet.

The first became known as the 'Proximal Origins Paper', the second as the 'Lancet Letter'. The Lancet Letter labelled a lab-leak hypothesis a conspiracy theory, stating "...the rapid, open, and transparent sharing of data on this outbreak is now being threatened by rumors and misinformation around its origins. We stand together to strongly condemn conspiracy theories suggesting that COVID-19 does not have a natural origin." The letter was orchestrated by Peter Daszak, president of the EcoHealth Alliance, which had channeled U.S. government funding to the Wuhan Institute of Virology (WIV), China's only biosafety-level-4 standards laboratory (BSL-4; the highest biohazard level), certified to work with dangerous pathogens, including research with coronaviruses. In fact, the WIV conducted research in which viruses became so changeable that they could infect human cells. The Proximal origins article claimed that SARS-CoV-2 was *not* a laboratory construct, but that COVID-19 was a zoonosis (an infectious disease that had jumped from an animal to a human).

The lab leak hypothesis was ruled out as a viable avenue of research by the WHO as well. After a visit of international scientists to Wuhan mandated by the World Health Assembly Resolution, from January 14th to February 10th in 2021, the lab leak theory was dismissed. It was "extremely unlikely" and "isn't a hypothesis we suggest implies further study", said Peter Ben Embarek, the WHO's chair of the investigation team in February 2021. The hypothesis of direct zoonotic transmission, in contrast, was 'worthy of further investigative studies' (Davidson, 2021). Embarek shared that China negotiated that 'the Frozen Food theory' was part of the report. The lab leak could be mentioned, under the condition that it was 'very unlikely' and that no further research was needed (Møller, 2021). The media was harsher still. Not only was the lab leak hypothesis labeled a conspiracy theory, with 'overwhelming consensus' on its animal origin, it was deemed 'anti-Chinese'. Slate magazine asserted that "rumors of a lab escape stem from historical amnesia, a caricatured villain, and good old-fashioned racism" (Evans, 2020).

The so called consensus on the origin of COVID was enforced by self-appointed 'fact-checkers'. They labelled the lab-leak theory one of the 'myths' on COVID and called it a 'debunked conspiracy theory' (Seitz and Dupuy, 2020). For example, on March 21st 2020, USA Today published a 'fact-check' titled, 'Did the coronavirus originate in a Chinese laboratory?' which stated that the lab leak theory was 'false information' and a 'conspiracy theory' that was pushed by 'right-leaning outlets' (Flood and Wulfsohn, 2023). During an Armed Services Committee session on February 2020, Republican Senator Tom Cotton questioned whether the Wuhan market really was 'ground zero', and mentioned that the WIV nearby worked on deadly pathogens, including coronaviruses. The New York Times (NYT) and Washington Post ridiculed Cotton. The NYT accused him of repeating a 'fringe theory', and the Post asserted that he repeated a 'conspiracy theory' that had already been 'debunked' (Stevenson, 2020). In the media, the debate was dominated by those that stated that there was zoonotic spillover. As one of its primary advocates, president of Eco Health Alliance Peter Daszak appeared on multiple TV-shows and was cited extensively in US and UK newspapers (Rindsberg, 2021). Opposing views were not aired.

In March 2020, social media companies started to censor content on COVID-19. Big tech companies like Meta (Facebook, Instagram) removed posts that alluded to the lab leak theory, and users who repeatedly shared the 'conspiracy theory' had their accounts suspended. CEO Mark Zuckerberg stated on March 4th 2020: "...it's not okay to share something that puts people in danger... So we are removing false claims and conspiracy theories that have been flagged by leading global health organisations". Anyone posting claims that the coronavirus was 'man-made' could have seen their posts removed or get a permanent ban from the platform (Kharpal, 2020). YouTube set slightly different rules for mis- and disinformation, and stated in May

2021 that there was no consensus on the origin of the virus.(Lima, 2021) As such, the video platform hosted a discussion between Joe Rogan and evolutionary biologist Bret Weinstein in June 2020, who explained why the lab-leak scenario was feasible (*Bret Weinstein: Why COVID-19 May Have Leaked from a Lab*, 2020). Both later became a victim of YouTube’s misinformation policy on different topics, and had their videos censored during the crisis.

The turning point for the rehabilitation of the lab leak hypothesis occurred in the Spring of 2021. On March 30th 2021, the White House stated that China had not been transparent in its joint investigation with the WHO into the origin of the virus (‘Joint Statement on the WHO-Convened COVID-19 Origins Study’, 2021). The investigation had earlier concluded that a transmission from animals to human was very likely, whereas a laboratory escape was judged extremely unlikely. On 12 April 2021 the Director-General of the WHO publicly stated that the lab leak hypothesis could not be ruled out: “Although the team has concluded that a laboratory leak is the least likely hypothesis, this requires further investigation, (...)”. China urged the WHO not to pursue the ‘lab leak theory’. The zoonosis theory was maintained as the only narrative (Liu, 2021).

On 5 May 2021 science reporter Nicholas Wade, who previously worked at Nature, Science and the New York Times, described the plausibility of a lab leak and concluded that a lab origin was ‘substantial’ based on the facts at that point in time. He also addressed a politically sensitive subject: the possible motive of the Biden administration and China to censor the lab leak option. Wade: “The US government shares a strange common interest with the Chinese authorities: Neither is keen on drawing attention to the fact that Shi’s coronavirus work was funded by the US National Institutes of Health” (Wade, 2021). His article was even picked up in the news (Board, 2021; Smerconish, 2021).

On 14 May 2021, 18 scientists published an open letter in the journal Science, and remarked that the WHO report was not balanced and called for a full investigation into the origin of the virus (Bloom *et al.*, 2021). The open letter was picked up by the media (Danner, 2021; Gorman and Zimmer, 2021). At the same time, Congressional Republicans launched separate probes into the origin of COVID-19, and two Republican senators introduced a bill that would force the Biden Administration to declassify intelligence on the origin of COVID (Singman, 2021). In mid-May 2021 the Editorial Board of the Washington Post published an opinion article titled: “Two possible theories of the pandemic’s origins remain viable. The world needs to know” (Editorial Board, 2021). This was a far cry from the newspaper’s conclusion a year earlier that it was a conspiracy theory. On 27 May 2021, President Biden ordered the U.S intelligence community to redouble its effort to investigate the origin of COVID-19 and report back in 90 days (Zurcker, 2021). What had been denounced as a ‘dangerous conspiracy theory’ and ‘disinformation’ for over a year was now suddenly labelled a valid scientific hypothesis by the US government and the WHO.

As a result, social media companies and fact-checkers reversed their policies. Facebook lifted the ban on discussing the lab-leak theory at the end of May 2021, and stopped censoring content on this topic.(Hern, 2021) The New York Post called it a ‘scandal of government censorship’ (Turley, 2023). In July 2023, Zuckerberg admitted his company indeed censored content related to COVID-19 under pressure from the White House (Thaler, 2023). This included large scale valid information on a lab leak origin. Fact-checkers and newspapers that had previously ridiculed the lab leak, quietly adjusted old articles that were published online. The Washington Post removed the words ‘debunked conspiracy theory’ from the title of a February 2020 article. Vox attempted to ‘stealth edit’ its article titled ‘the conspiracy theories about the origins of the virus, debunked’, and was caught changing some of its so called ‘debunking’ (Louise, 2021). Fact Check published a new piece in June 2021, recognizing that there were gaps in knowledge and possibilities. Although the piece was slanted towards natural spillover, it acknowledged that this theory had not been proven either (McDonald, 2021).

New evidence emerged on how the initial debate was manipulated. Through Freedom of information requests, independent researchers and journalists discovered that, while the authors of the Proximal Origins

paper publicly disparaged the lab leak hypothesis, they privately communicated with each other saying the exact opposite. As internal messages among scientists revealed, virologist Kristian Andersen wrote in February 2020: “Accidental escape [from a lab] is in fact highly likely—it’s not some fringe theory” (Tilley, 2023). Even one month after the Proximal Origins paper was published, Andersen still had doubts. On April 15th 2020, he wrote: “I really really want to go out there guns swinging saying ‘don’t be such an idiot believing these dumb theories - the president is deflecting from the real problems’, but I’m worried that we can’t fully disprove culture. [...] We also can’t fully rule out engineering (for basic research) - yes, no obvious signs of engineering, but that furine site could still have been inserted... ..and clearly creating the reverse genetic system isn’t hard - the Germans managed to do exactly that for SARS-CoV-2 in less than a month.” (Proximal Origins Slack, 2020).

The Lancet letter also came under scrutiny, and more than a year later, the journal published an addendum clarifying undisclosed conflicts of interest of the authors (Lancet, 2021). The Lancet’s editor would later admit before the UK Parliament’s Science and Technology Select Committee that there were, regrettably, significant competing interests and that it took the journal over a year to persuade Daszak to declare them (Oral evidence: Reproducibility and Research Integrity, HC 606, 2021, p. 606). The other authors did not reevaluate their own conflicting interests, but an investigation by the Daily Telegraph indicated that 26 of the 27 scientists were linked to researchers at Wuhan, their colleagues or funders. Five had even worked for Daszak’s EcoHealth Alliance, that had funded research with coronaviruses in the Wuhan laboratory (Knapton, 2021).

Scientific research on the origin of COVID was significantly impacted by the censorship of the lab leak hypothesis. Researching a topic labeled a ‘conspiracy theory’ carried risks for academic careers. For example, Jonathan King, a MIT molecular biologist, said that he and other scientists were concerned about the possibility of a lab accident. He declared that there were ‘very intense pressures’ on scientists not to push on issues of laboratory biohazards. (Baker, 2021) Alina Chan, a molecular biologist at MIT and Harvard, told a UK parliamentary hearing that she, like many other scientists working on COVID, had suffered abuse. She feared that working on a topic that was condemned as ‘anti-scientific, racist and right wing’ had career effects’ (Morgan, 2021). Dr. Chan received multiple death threats for sharing her scientific opinion regarding a lab leak origin (Kaplan, 2021). Also, former CDC Director Robert Redfield said that he received death threats after telling CNN in March 2021 that he believed the virus probably escaped from the Wuhan laboratory (Basu, 2021).

The lab-leak ‘theory’ is perhaps a misnomer - it is a *hypothesis*; a research question in urgent search of an answer. As some experts have argued, insights into the origin of the COVID-19 outbreak are vital to prevent the next one (Relman, 2020; Bloom *et al.*, 2021). As stated by the World Health Organization on 4 September 2024 on X: “We still don’t know how the COVID-19 pandemic began, and unfortunately, the work to understand its origins remains unfinished.” In the post, WHO also points out that China needs to share their data on ‘work done at laboratories in Wuhan’ (World Health Organization [@WHO], 2024). The evidence for a zoonotic spill-over remains very thin or lacking, in contrast to the initial public strong claims of those involved in the conduct of research with coronaviruses in Wuhan. Scientists have not found a virus in either bats or another animal that matches the genetic make-up of COVID-19 (BBC News, 2021). The experts who were silenced had valid and valuable information to share, an ‘inconvenient probability’, that was taken out of the debate (Weissman, 2024).

Despite the risks, scientists worldwide investigated the lab leak hypothesis. There are indeed specific indications of a genetically engineered virus, for example as well addressed by e.g. Australian professor Nicholas Petrovsky and American biologist Alex Washburne (Schmidt, 2021). The current FBI Director Cristopher Wray as well as the U.S. Energy Department both estimated that a lab leak is the ‘most likely’ origin of the virus (Matza and Yong, 2023). Professor Jeffrey Sachs, who headed the ‘Lancet Commission on lessons for the future from the COVID-19 Pandemic’, bemoaned the lack of transparency from Peter Daszak and those involved in the research in Wuhan, and has stated that he is convinced that COVID-19 came from a laboratory (Robinson, 2022).

Former CDC Director Dr. Robert Redfield stated on 8 March 2023 during a House Hearing: “Based on my initial analysis of the data, I came to believe and I still believe today that it indicates that COVID-19 more likely was the result of an accidental lab leak than a result of a natural spillover event.” When we look at history, lab leaks are not rare. There have been six separate SARS escapes from virology laboratories studying it in 2003 and 2004: one each in Singapore and Taiwan, and in four distinct events at the same laboratory in Beijing (Furmanski, 2014). In 2023, The Office of the Director of National Intelligence reported on a biosafety concern at the Wuhan laboratory. WIV researchers performed SARS-like coronavirus experiments in BSL-2 laboratories, despite acknowledgements of these virus’ ability to directly infect humans through their spike protein and early 2019 warnings of the danger of this practice (*Potential Links between the Wuhan Institute of Virology and the Origin of the COVID-19 Pandemic*, 2023).

The topic of a lab leak is no longer as toxic as it was, and there has been some but limited introspection in the media and academia on their false reporting, however, that cannot undo the harm of years of censorship, slander and intimidation of dissent scientists. As NYT Columnist Bret Stephens argued ‘when lecturing the public about the dangers of misinformation, it’s best not to peddle it yourself’ (Stephens, 2021).

2.2 Route of Coronavirus Transmission

In March 2020 the WHO published the following statement on their website: ‘According to current evidence, COVID-19 virus is primarily transmitted between people through respiratory droplets and contact routes’ (*Modes of transmission of virus causing COVID-19: implications for IPC precaution recommendations*, 2020). Consequently, up to four years in the crisis, large droplets and fomites (contaminated objects) dominated the general understanding of COVID transmission. While the WHO and CDC both stated that aerosols could lead to transmission under highly specific situations, both organizations maintained that aerosols are not important for years. Aerosol (‘airborne’) transmission is similar to droplet transmission, except that the bits of fluid are so small that they can linger in the air for minutes to hours.

Several experts supported the statement of the CDC and the WHO. Illustrative is an open letter sent by a group of infectious disease specialists and epidemiologists from Toronto in May 2020, stating aerosol transmission is a dangerous conspiracy theory: ‘Those challenges are underpinned by the belief this disease is airborne, and that wearing N95 masks will reduce health-care worker risk, when the evidence and the science say otherwise..... Promoting unfounded conspiracy theories is irresponsible and a serious risk to public health’ (Bitnun, Bogoch and Chakrabarti, 2020). However, many scientists worldwide did not agree that aerosol transmission was a conspiracy theory and advocated preventive measures to mitigate airborne transmission like ventilation.

For example, on 6 July 2020, 241 scientists appealed to the WHO to reevaluate their stance on the spread of the virus. “We appeal to the medical community and to the relevant national and international bodies to recognize the potential for airborne spread of coronavirus disease 2019 (COVID-19). There is significant potential for inhalation exposure to viruses in microscopic respiratory droplets (microdroplets) at short to medium distances (up to several meters, or room scale), and we are advocating for the use of preventive measures to mitigate this route of airborne transmission.” The WHO only slightly updated its position, but continued to express the original narrative accompanied by neglecting the importance of aerosols (Morawska and Milton, 2020). Consequently, governments implemented social distancing and hygiene interventions, based on the belief that fomites and large droplets were the key route of transmission for COVID. Despite no evidence for the effectiveness of these measures, plexi-glass shields and 6 foot (1,5 m) distancing were implemented without taking aerosol transmission into account. Scientists and others who argued for the ventilation of indoor spaces – and that the virus was spread by aerosols – were discredited and censored (Morawska, Li and Salthammer, 2024). For example, in the Netherlands, researcher and social geographer Maurice de Hond saw his articles on aerosols and ventilation flagged as ‘disinformation’. LinkedIn did not allow any information that was not in line with the WHO’s take on the subject and banned him from the platform (*Maurice de Hond: ‘LinkedIn-blokkade lijkt georganiseerde actie’*, 2020). Another example concerned UK

scientist Dr. Matthew Knight, who was banned from Twitter over a single post about COVID in May 2021. The respiratory physician said that since COVID is ‘airborne’, ventilation filters were needed to make hospitality venues safe and free of viruses for visiting customers. His post was deemed to contain ‘misleading and potentially harmful information’ and was removed (Paget, 2021).

The statements of the WHO and government institutions like CDC were considered to be the single source of truth by governments and big tech companies. For example, Meta (Facebook, Instagram), stated in March 2020: “We regularly update the claims that we remove based on guidance from the WHO and other health authorities”(Clegg, 2020). Subsequently, posts on the aerosol route of transmission were censored at scale. Early in 2021, Facebook said it took down 1.3 billion accounts between October and December 2020 and removed more than 12 million pieces of information flagged as ‘covid misinformation’. In May 2021 alone, Facebook and Instagram reportedly removed 76 000 posts that were flagged as ‘disinformation’ (Reuters, 2023). Up to July 2021, Twitter had reportedly suspended 1500 accounts, removed 43 000 tweets and challenged 11.7 million accounts for disseminating presumed ‘disinformation’ relating to COVID, including many accounts belonging to legitimate experts, scientists, or doctors (Joron, 2023).

It took WHO almost two years to publicly acknowledge that COVID was indeed airborne. In March 2021, the WHO updated its website, placing more emphasis on COVID transmission from inhaled airborne droplets (aerosols) and ventilation (*Roadmap to improve and ensure good indoor ventilation in the context of COVID-19*, 2021). In the spring of 2024, after growing criticism, the WHO finally changed how it classifies pathogens that spread through the air (Nogrady, 2024). Other scientists admitted that the social distancing policies, based on the false belief that COVID was spread by large droplets and fomites, were not even evidence based. Dr. Fauci stated to lawmakers in January 2024 that guidelines to keep six feet of separation ‘sort of just appeared’ and was not based on any science (Christenson, 2024). Schools worldwide remained closed well into the second year of the crisis as a result of the distancing guidelines, while the measure was not evidence-based and while known that children played a negligible role in the spread of the virus. Chairman Wenstrup concluded that Fauci’s admissions impacted public trust in health authorities, and that hearings ‘revealed systemic failures in our public health system and shed light on serious procedural concerns with our public health authority’(Wenstrup Releases Statement Following Dr. Fauci’s Two-Day Testimony, 2024). In addition to the harm done to science and the censored scientists, censorship of valid hypotheses regarding the spread of the disease may have jeopardized people’s health and safety.

2.3 Face Masks

At the start of COVID, there was no evidence supporting the need, effectiveness and safety of face masks for SAR-COV-2 like viruses. Face masks were not part of pandemic protocols (Jefferson and Heneghan, 2020). The WHO therefore stated at the start of COVID there was not enough evidence to advise healthy people to wear masks. This was also expressed by leading scientists and health institutions worldwide. For example the head of the Dutch Center for Disease Control, Jaap van Dissel, said during a hearing on 7 May 2020 that wearing masks has little effect on the spread of the virus. He called mandates a ‘political decision’. Dutch vice-prime minister Ollongren confirmed that masking was indeed a political decision. She also admitted masks were implemented as a psychological intervention to ‘influence behavior’(Kraak, 2020). The Dutch Minister of Health De Jonge confirmed this on 30 July 2020: “Based on the advice of the Outbreak Management Team there is no need from a health perspective to mandate face masks. What we do is regional experiments to influence behavior.”(Tweet Hugo de Jonge 20 July 2020) The psycho-behavioral experiments, however, did not have any positive effect (Liebst *et al.*, 2022).

In Germany, recent exposed files from the Robert Koch Institute (RKI), indicated that the RKI already knew in 2020 that mask mandates did not have any scientific ground, and even carried risks. On January 2021 RKI even advised against FFP2-masks for ‘laymen’. Significant side effects were noted, especially among children (Schweitzer and Kattwinkel, 2024). Despite this, the German government introduced a mask mandate in public transport for children 6-13 years old in 2022 (Luyken, 2024). In the US, the chief medical

advisor to the President, Dr. Anthony Fauci first stated that masks were ineffective and unnecessary. In March 2020 Fauci told 60 Minutes: "Right now in the United States, people should not be walking around with masks." (March 2020: Dr. Anthony Fauci talks with Dr. Jon LaPook about COVID-19, 2020). Only a few weeks later, he began recommending widespread use of face masks. Fauci defended his U-turn saying, "When the facts change, I change my mind." However, the facts had not changed and no new scientific evidence had emerged to support masking (Jefferson *et al.*, 2023). Despite the lack of evidence, Fauci and other experts insisted on face mask mandates, claiming that face masks would not only stop people from infecting others, but also protect the wearer.

After many governments made a U-turn on masks in the spring of 2020, the WHO followed suit. In June 2020 the WHO changed its advice on masks, saying they should be worn in public where distancing is not possible to stop the spread (Shukman, 2020). Despite the lack of evidence for their need, effectiveness and safety, many countries subsequently went onto mask mandates for the public in various settings, sometimes even mandating them for children. Up to now, no scientific evidence has been found that supports face masks in children; studies indicate harm (Sandlund *et al.*, 2023). "What Fauci doesn't understand is that cloth and surgical masks cannot stop viruses because viruses are too small and they still get through," said Tom Jefferson of the University of Oxford. Jefferson: "There is just no evidence that they [masks] make any difference. Full stop" (Demasi, 2023).

Social media platforms included valid scientific critique on masks as mis- or disinformation in their COVID policies. Any scientific information, not supportive or critical of face mask mandates, or warnings from experts on potential risks or harm, were censored far into the COVID crisis. Meta, for example, created a list with information that was not allowed on the platform, including scientific data or scientific views addressing that face masks didn't stop the spread of COVID-19. Posts that were critical on face masks or showed it was not an effective medical intervention to stop the spread of the virus, and/or pointed out risks of mask mandates, were removed. Scientists were suspended or permanently banned from social media platforms at large scale.

There are several examples of prominent scientists who were censored when presenting research findings online. Professor Carl Heneghan and Dr. Tom Jefferson authored a paper called, 'Landmark Danish Study Shows Face Masks Have No Significant Effect.' The study was done in Denmark in which 6,000 persons were divided into 2 groups, half wearing masks outside their homes and half not wearing masks. The infection rate for mask-wearers was 1.8%. The rate for those who did not wear masks was 2.1%. The scientists concluded that masks have only a very small effect on preventing the spread of the disease. Facebook censored any posts on the scientific paper, adding a warning on the article and stating that it was 'checked by independent fact-checkers' (Oxford Scientists Slam Facebook For 'Censorship' Over COVID Mask-Wearing Article, 2020).

Censorship was not only limited to the academic field. Politicians were also censored. YouTube removed videos by American Senator Rand Paul, a qualified medical doctor, and suspended him after he posted a video that disputed the effectiveness of masks in limiting the spread of the virus. YouTube said the Republican senator's claims in the video had violated the company's policy on COVID-19 medical misinformation (Victor, 2021). The narrative was created that masks were an evidence based medical intervention, while this was not the case. Rather, it was a psycho-behavioral experiment intended to add to a sense of safety, although there is little evidence to support this (Millest *et al.*, 2024). Mandating a psychological intervention could also have contributed to an increased perception of danger and polarization: those who masked, feared the unmasked, sometimes leading to situations of social pressure and expressions of hate (see, for example: Ferguson, 2020; BBC News, 2020). It also led to illogical situations, such as wearing masks outdoors or while swimming, or while walking in a restaurant (not sitting).

Aside from whether it is ethical to be dishonest as a government to influence people's behavior, there is also the question of need (urgency), efficacy and safety. The WHO and virologists are no experts on social

behavior. In fact, there is no evidence that masks provided meaningful change in behavior. Masks have inflicted needless harm (Liebst *et al.*, 2022). Large scale online censorship has stifled the debate but may also have harmed democratic values, including freedom of speech as well as diversity and inclusion. Censorship on the (lack) of evidence of masks as medical intervention, combined with psychological effects, may have contributed to group think in the compliant group who believed the narrative. A study on polarization showed a predominance of pro-mask hashtags along with an ‘echo chamber’ effect in the dominant pro-mask group (Lang, Erickson and Jing-Schmidt, 2021).

3.0 REFLECTION

Disinformation policies during COVID-19 led to large scale censorship over a period of several years. As the three case studies have shown, censorship stifled academic debate – a debate that could and should have informed policy decisions. In the end, the policies implemented on masking and social distancing were not supported by scientific evidence, contrary to what was claimed at the time. These policies, including the masking of children, have had significant negative societal impacts. As the harms and the unintended secondary effects of these COVID-policies become more apparent, some defend the original policies by saying that they were based on the available data and insights at the time. This was not the case, since those who questioned the effectiveness, proportionality or the ethical grounding of these policies, or shared their expertise and empirical evidence, were censored, often losing their jobs and/or reputations.

Debate is a cornerstone of science. Without it, key principles such as transparency of data and sources, reproducibility of results, and objectiveness of methodology are all moot. Science revolves around testing hypotheses and sharing information rather than declaring those taboo and preventing debate. The false public accusations of spreading mis- and disinformation, accompanied by suppressing and removing scientists from social media, also had a chilling effect on others. As illustrated by the origins debate, the lab leak hypothesis became a tainted topic, and scientists risked their credibility and career if they investigated this. As such, a climate was created where scientists resorted to self-censorship, although it is unknown how many. In addition, large scale censorship of scientists renders any claim of ‘scientific consensus’ on a given topic as impossible – leaving aside that majority thinking does not bear any relation to the thoughts being correct or false.

There are potentially also legal implications of censorship. Substantiated information was removed or suppressed, and social media accounts blocked or permanently suspended, which is in violation of the right of free speech. In times of an emergency, people have the right to share knowledge and to be well informed, especially when it comes to a person’s health. When information is censored, this right may also be violated. Further, in case of experiments, like with the mask mandates, people have the right to receive informed consent, including information on objectives and risks. It is unlikely that informed consent was obtained.

Censorship can also lead to a false representation of reality. When specific information is removed at scale and for a long time, the dominant narrative might misinform the public as well as people working in academia, journalism or politics. Censorship, when combined with aggressive marketing of one story, can lead to group think and hatred towards dissidents. Censored individuals, as a result of being forbidden to partake in the debate, may lose trust in the democratic system. Together with the fear that was instilled in the general public for those spreading ‘dangerous conspiracies’, accusations of ‘disinformation’ fuel polarization (Vasist, Chatterjee and Krishnan, 2023) (Frasz, 2022).

In several cases censored scientists received intimidations and death threats during COVID. Online harassment of professionals with public visibility has potentially harmful societal consequences, including its silencing effect. Targeted individuals may refrain from voicing their opinion, which can negatively affect their lives, and add to an unsafe climate (Campbell, 2021). Thus, censorship can lead to fear and self-censorship (Gibson and Sutherland, 2023).

Governments and social media platforms should not rely on content removal for combatting harmful scientific misinformation online, a report of the UK Royal Society concluded. The report warns censorship could even exacerbate feelings of distrust in authorities (*The online information environment: Understanding how the internet shapes people's engagement with scientific information*, 2022). In fact, trust in governments and institutions has declined after COVID-19.

An often heard reason for the decline in trust is “the spread of misinformation” (*Trust in institutions continues to fall in EU, despite declining unemployment and phasing out of pandemic restrictions*, 2022). In 2021, a survey by The Edelman Trust Barometer (2021), which has a history of polling on trust in public institutions, illustrated the impact of government policies on trust. The Barometer found that 57% of people believed that government leaders, business chiefs and journalists were exaggerating the dangers of the virus and that they were spreading falsehoods related to COVID (John, 2021). When people feel misled, trust will decline.

Censorship of credible scientists during COVID showed that terms like ‘disinformation’ or ‘conspiracy theory’ can be easily (mis)used. This devaluates both terms. Even when applied with good intentions, we need to evaluate the negative impact of censoring valid information. From a philosophical point of view, you could debate who can distinguish facts from fiction and who should be an arbiter of truth.

4.0 CONCLUSION

The observations in this paper suggest that large scale censorship can lead to obstruction of truth finding and scientific progression, and a violation of human rights like freedom of expression. Censorship may – theoretically - have the advantage of short term government support and trust. However, research indicated that trust in governments declined after the crisis. This can be seen in the light of increased awareness of government censorship by the population. We hypothesize that censorship during COVID, has contributed to feelings of being misled, and a decline in trust in governments. This may negatively affect future compliance to government policies during a crisis.

To judge whether the large scale censorship of valid information during COVID-19 was *legal*, we need to consider the right of freedom of speech, the right to be informed during a crisis and the right to receive an Informed Consent when it concerns an experiment with masks. These rights may have been violated during COVID. Legal judgement and implications of this are beyond the scope of this paper, but we recommend that legal aspects of the censorship during COVID are evaluated.

To answer the question if censorship during COVID was *ethical* we need to outweigh benefits and harms. Censorship may lead to a short term compliance of government measures. However, when the need, efficacy and safety of those measures cannot be debated, needless harm can be afflicted. Valuable insights and solutions may be missed when scientific principles are neglected and the debate is stifled.

Based on the identified negative consequences, we conclude that the censorship of valid information during COVID was unethical. We identified negative effects on the scientific process as well as on democratic values, which may have led to unsafe situations. It also may have affected social cohesion negatively, as well as people's tolerance to opposite views, fueling polarization and aggression.

Artificial Intelligence (AI) has become a more important tool in seeking solutions to combat fake news. E.g. AI has been used by Facebook to detect ‘disinformation’. During COVID, once some (unknown) person had flagged a post, AI systems took over to search for identical or similar information and automatically took them down, labelling the post as ‘disinformation’ without any debate or rationale. (Hao, 2020) Implementing AI algorithms may therefore do more harm than good. This needs further study.

In conclusion, it has become evident that ethical considerations serve as essential instruments for cultivating *trust* and credibility of governments (Germani *et al.*, 2024). After COVID-19, trust in governments has declined, as well as trust in some health policies and experts. For future health crises, governments may want to invest in the regain of this lost trust. Based on our findings, more censorship of citizens by governments is probably not be the right route to regain trust. It may demand intensive reflection, humility and honesty. As an old Dutch saying goes: ‘Trust comes on foot and goes by horse’.

5.0 BIBLIOGRAPHY

- [1] Adhanom, T. (2020) Munich Security Conference, World Health Organisation. Available at: <https://www.who.int/director-general/speeches/detail/munich-security-conference> (Accessed: 3 January 2022).
- [2] Andersen, K.G. et al. (2020) ‘The proximal origin of SARS-CoV-2’, *Nature Medicine*, 26(4), pp. 450–452. Available at: <https://doi.org/10.1038/s41591-020-0820-9>.
- [3] Baker, N. (2021) The Lab-Leak Hypothesis, *Intelligencer*. Available at: <https://nymag.com/intelligencer/article/coronavirus-lab-escape-theory.html> (Accessed: 8 February 2022).
- [4] Basu, Z. (2021) Ex-CDC director says he received threats from other scientists after backing lab-leak theory, *Axios*. Available at: <https://www.axios.com/2021/06/03/lab-leak-theory-redfield-vanity-fair> (Accessed: 25 September 2024).
- [5] BBC News (2020) ‘Face mask: Lip-reading sisters abused for lifting mask on train’, 25 July. Available at: <https://www.bbc.com/news/uk-england-merseyside-53539468> (Accessed: 25 September 2024).
- [6] BBC News (2021) ‘Covid origin: Why the Wuhan lab-leak theory is so disputed’, 27 May. Available at: <https://www.bbc.com/news/world-asia-china-57268111> (Accessed: 26 September 2024).
- [7] Bitnun, A., Bogoch, I. and Chakrabarti, S. (2020) Evidence shows COVID-19 is almost exclusively spread by droplets, *Toronto Star*. Available at: https://www.thestar.com/opinion/letters-to-the-editor/evidence-shows-covid-19-is-almost-exclusively-spread-by-droplets/article_bad1323d-7a20-501b-999c-a53dff46b13.html (Accessed: 10 September 2024).
- [8] Bloom, J.D. et al. (2021) ‘Investigate the origins of COVID-19’, *Science*. Edited by J. Sills, 372(6543), pp. 694–694. Available at: <https://doi.org/10.1126/science.abj0016>.
- [9] Board, P.E. (2021) ‘The “Wuhan lab leak” theory looks more credible than ever’, 23 May. Available at: <https://nypost.com/2021/05/22/the-wuhan-lab-leak-theory-looks-more-credible-then-ever/> (Accessed: 26 September 2024).
- [10] Boseley, S. (2020) ‘WHO declares coronavirus pandemic’, *The Guardian*, 11 March. Available at: <https://www.theguardian.com/world/2020/mar/11/who-declares-coronavirus-pandemic> (Accessed: 20 September 2024).
- [11] Bret Weinstein: Why COVID-19 May Have Leaked from a Lab (2020). Available at: <https://www.youtube.com/watch?v=zQLF4DUSXGs> (Accessed: 27 September 2024).
- [12] Campbell, D. (2021) ‘Scientists abused and threatened for discussing Covid, global survey finds’, *The Guardian*, 13 October. Available at: <https://www.theguardian.com/world/2021/oct/13/scientists-abused-and-threatened-for-discussing-covid-global-survey-finds> (Accessed: 25 September 2024).

- [13] Christenson, J. (2024) 'Fauci admits to Congress that COVID social distancing guidelines lacked scientific basis', The New York Post, 10 January. Available at: <https://nypost.com/2024/01/10/news/fauci-admits-to-congress-that-certain-covid-social-distancing-guidelines-lacked-scientific-basis-sort-of-just-appeared/> (Accessed: 25 September 2024).
- [14] Clegg, N. (2020) 'Combating COVID-19 Misinformation Across Our Apps', Meta, 25 March. Available at: <https://about.fb.com/news/2020/03/combating-covid-19-misinformation/> (Accessed: 26 September 2024).
- [15] Danner, C. (2021) 'COVID Lab-Leak Hypothesis Just Got a Big Credibility Boost', *Intelligencer*, 14 May. Available at: <https://nymag.com/intelligencer/2021/05/covid-lab-leak-hypothesis-just-got-a-big-credibility-boost.html> (Accessed: 8 February 2022).
- [16] Davidson, H. (2021) 'WHO team says theory Covid began in Wuhan lab "extremely unlikely"', The Guardian, 9 February. Available at: <https://www.theguardian.com/world/2021/feb/09/wuhan-laboratory-leak-covid-origin-theory-unlikely-says-who-team> (Accessed: 24 September 2024).
- [17] Deibert, R.J. (2010) 'The geopolitics of internet control: censorship, sovereignty and cyberspace', in A. Chadwick and P.N. Howard (eds) *Routledge Handbook of Internet Politics*. Taylor & Francis.
- [18] Demasi, M. (2023) EXCLUSIVE: Lead author of Cochrane mask review responds to Fauci's dismissal of evidence, Maryanne Demasi, reports. Available at: <https://maryannedemasi.substack.com/p/exclusive-lead-author-of-cochrane> (Accessed: 18 September 2023).
- [19] Directorate-General for Communications Networks, C. and T. (European C. (2018) A multi-dimensional approach to disinformation: report of the independent High level Group on fake news and online disinformation. LU: Publications Office of the European Union. Available at: <https://data.europa.eu/doi/10.2759/739290> (Accessed: 5 January 2022).
- [20] 'Tweet Hugo de Jonge 300720', Twitter. Available at: https://x.com/digital_human/status/1833091089735053445 (Accessed: 28 September 2024).
- [21] Editorial Board (2021) 'Opinion | Two possible theories of the pandemic's origins remain viable. The world needs to know.', Washington Post, 17 May. Available at: https://www.washingtonpost.com/opinions/global-opinions/two-possible-theories-of-the-pandemics-origins-remain-viable-the-world-needs-to-know/2021/05/17/b87f0b0e-b737-11eb-96b9-e949d5397de9_story.html (Accessed: 8 February 2022).
- [22] Erlanger, S. (2020) 'Macron Declares France "at War" With Virus, as E.U. Proposes 30-Day Travel Ban', The New York Times, 16 March. Available at: <https://www.nytimes.com/2020/03/16/world/europe/coronavirus-france-macron-travel-ban.html> (Accessed: 22 September 2024).
- [23] Evans, N.G. (2020) 'Where the Coronavirus Bioweapon Conspiracy Theories Really Come From', *Slate*, 27 February. Available at: <https://slate.com/technology/2020/02/coronavirus-bioweapon-conspiracy-theories.html> (Accessed: 26 January 2022).
- [24] Ferguson, D. (2020) 'Mask rage: "One man told me I shouldn't be allowed out if I can't wear one"', The Guardian, 1 August. Available at: <https://www.theguardian.com/world/2020/aug/01/mask-face-coverings-i-cant-wear-one-health-reasons> (Accessed: 25 September 2024).
- [25] Flood, B. and Wulfsohn, J. (2023) Credibility crisis: Media 'fact-checkers' were eager to debunk COVID lab leak theory, had to issue corrections, Fox News. Fox News. Available at: <https://www.foxnews.com/media/credibility-crisis-media-fact-checkers-eager-debunk-covid-lab-leak-theory-issue-corrections> (Accessed: 26 September 2024).

- [26] Frasz, S. (2022) Impacts of Censorship On Political Polarization. Honors Program Theses 175. Available at: <https://scholarship.rollins.edu/honors/175>.
- [27] Furmanski, M. (2014) Laboratory Escapes and “Self-fulfilling prophecy” Epidemics. Arms Control Center. Available at: <https://armscontrolcenter.org/wp-content/uploads/2016/02/Escaped-Viruses-final-2-17-14-copy.pdf>.
- [28] Germani, F. et al. (2024) ‘Ethical Considerations in Infodemic Management: Systematic Scoping Review’, JMIR infodemiology, 4, p. e56307. Available at: <https://doi.org/10.2196/56307>.
- [29] Gibson, J.L. and Sutherland, J.L. (2023) ‘Keeping Your Mouth Shut: Spiraling Self-Censorship in the United States’, Political Science Quarterly, 138(3), pp. 361–376. Available at: <https://doi.org/10.1093/psquar/qqad037>.
- [30] Gorman, J. and Zimmer, C. (2021) ‘Another Group of Scientists Calls for Further Inquiry Into Origins of the Coronavirus’, The New York Times, 13 May. Available at: <https://www.nytimes.com/2021/05/13/science/virus-origins-lab-leak-scientists.html> (Accessed: 8 February 2022).
- [31] Green, J. and Karolides, N.J. (2014) Encyclopedia of Censorship. Infobase Publishing.
- [32] Hao, K. (2020) Facebook’s AI is still largely baffled by covid misinformation, MIT Technology Review. Available at: <https://www.technologyreview.com/2020/05/12/1001633/ai-is-still-largely-baffled-by-covid-misinformation/> (Accessed: 24 September 2024).
- [33] Hern, A. (2021) ‘Facebook lifts ban on posts claiming Covid-19 was man-made’, The Guardian, 27 May. Available at: <https://www.theguardian.com/technology/2021/may/27/facebook-lifts-ban-on-posts-claiming-covid-19-was-man-made> (Accessed: 12 October 2021).
- [34] Jefferson, T. et al. (2023) ‘Physical interventions to interrupt or reduce the spread of respiratory viruses’, Cochrane Database of Systematic Reviews [Preprint], (1). Available at: <https://doi.org/10.1002/14651858.CD006207.pub6>.
- [35] Jefferson, T. and Heneghan, C. (2020) ‘Masking lack of evidence with politics’, The Centre for Evidence-Based Medicine, 23 July. Available at: <https://www.cebm.net/covid-19/masking-lack-of-evidence-with-politics/> (Accessed: 25 September 2024).
- [36] John, M. (2021) ‘Public trust crumbles under COVID-19, fake news -survey’, Reuters, 13 January. Available at: <https://www.reuters.com/business/media-telecom/reuters-next-public-trust-crumbles-under-covid-19-fake-news-survey-2021-01-13/> (Accessed: 14 September 2024).
- [37] ‘Joint Statement on the WHO-Convened COVID-19 Origins Study’ (2021) United States Department of State, 30 March. Available at: <https://www.state.gov/joint-statement-on-the-who-convened-covid-19-origins-study/> (Accessed: 27 September 2024).
- [38] Joron, V. (2023) Parliamentary question | Disinformation on Twitter revealed by Elon Musk: has the Commission established a ministry of truth? | E-000082/2023, European Parliament. Available at: https://www.europarl.europa.eu/doceo/document/E-9-2023-000082_EN.html (Accessed: 25 September 2024).
- [39] Kaplan, M. (2021) ‘Dr. Alina Chan doubles down on COVID-19 Wuhan lab origin theory’, The New York Post, 22 December. Available at: <https://nypost.com/2021/12/22/dr-alina-chan-doubles-down-on-covid-19-origin-theory/> (Accessed: 25 September 2024).

- [40] Kharpal, A. (2020) Facebook is giving free ads to the WHO and taking down ‘conspiracy theories’ about coronavirus, CNBC. Available at: <https://www.cnn.com/2020/03/04/coronavirus-facebook-offers-free-ads-to-who-will-remove-false-claims.html> (Accessed: 26 September 2024).
- [41] Knapton, S. (2021) ‘Revealed: How scientists who dismissed Wuhan lab theory are linked to Chinese researchers’, The Telegraph, 10 September. Available at: <https://www.telegraph.co.uk/news/2021/09/10/revealed-scientists-dismissed-wuhan-lab-theory-linked-chinese/> (Accessed: 9 February 2022).
- [42] Kraak, H. (2020) ‘Zet mondkapje niet steeds op en af, adviseert kabinet’, de Volkskrant, 2 October. Available at: <https://www.volkskrant.nl/nieuws-achtergrond/zet-mondkapje-niet-steeds-op-en-af-adviseert-kabinet~b16ed644/> (Accessed: 25 September 2024).
- [43] Lancet, E. of T. (2021) ‘Addendum: competing interests and the origins of SARS-CoV-2’, The Lancet, 397(10293), pp. 2449–2450. Available at: [https://doi.org/10.1016/S0140-6736\(21\)01377-5](https://doi.org/10.1016/S0140-6736(21)01377-5).
- [44] Lang, J., Erickson, W.W. and Jing-Schmidt, Z. (2021) ‘#MaskOn! #MaskOff! Digital polarization of mask-wearing in the United States during COVID-19’, PLoS ONE, 16(4), p. e0250817. Available at: <https://doi.org/10.1371/journal.pone.0250817>.
- [45] Leyen, U., von der. (2024) Special Address by the President: World Economic Forum, World Economic Forum. Available at: https://ec.europa.eu/commission/presscorner/detail/en/speech_24_221 (Accessed: 20 September 2024).
- [46] Liebst, L.S. et al. (2022) ‘No evidence that mask-wearing in public places elicits risk compensation behavior during the COVID-19 pandemic’, Scientific Reports, 12(1), p. 1511. Available at: <https://doi.org/10.1038/s41598-022-05270-3>.
- [47] Lima, C. (2021) Facebook no longer treating ‘man-made’ Covid as a crackpot idea, Politico. Available at: <https://www.politico.com/news/2021/05/26/facebook-ban-covid-man-made-491053> (Accessed: 12 October 2021).
- [48] Liu, N. (2021) Beijing Urges WHO Leader Not to Pursue ‘Lab Leak’ Theory, VOA. Available at: https://www.voanews.com/a/covid-19-pandemic_beijing-urges-who-leader-not-pursue-lab-leak-theory/6204933.html (Accessed: 8 February 2022).
- [49] Louise, N. (2021) ‘Vox caught stealth editing an old article from March 2020 “debunking” the lab origin of COVID-19’, Tech News, 24 May. Available at: <https://techstartups.com/2021/05/24/vox-caught-stealth-editing-old-article-march-2020-debunking-lab-origin-covid-19/> (Accessed: 8 February 2022).
- [50] Luyken, J. (2024) ‘German officials warned lockdowns cause more harm than good, documents show’, The Telegraph, 25 March. Available at: <https://www.telegraph.co.uk/world-news/2024/03/25/german-health-agency-covid-lockdown-masks-legal-battle/> (Accessed: 25 September 2024).
- [51] March 2020: Dr. Anthony Fauci talks with Dr Jon LaPook about Covid-19 (2020). Available at: https://www.youtube.com/watch?v=PRa6t_e7dGI (Accessed: 25 September 2024).
- [52] Matza, M. and Yong, N. (2023) ‘FBI chief Christopher Wray says China lab leak most likely’, BBC News, 1 March. Available at: <https://www.bbc.com/news/world-us-canada-64806903> (Accessed: 25 September 2024).
- [53] Maurice de Hond: ‘LinkedIn-blokkade lijkt georganiseerde actie’ (2020) NOS. Available at: <https://nos.nl/artikel/2344216-maurice-de-hond-linkedin-blokkade-likt-georganiseerde-actie> (Accessed: 25 September 2024).

- [54] McDonald, J. (2021) 'The Facts – and Gaps – on the Origin of the Coronavirus', FactCheck.org, 25 June. Available at: <https://www.factcheck.org/2021/06/scicheck-the-facts-and-gaps-on-the-origin-of-the-coronavirus/> (Accessed: 12 October 2021).
- [55] Millest, A. et al. (2024) 'Effect of face-covering use on adherence to other COVID-19 protective behaviours: A systematic review', PloS One, 19(4), p. e0284629. Available at: <https://doi.org/10.1371/journal.pone.0284629>.
- [56] Milmo, D. (2021) 'YouTube to remove misinformation videos about all vaccines', The Guardian, 29 September. Available at: <https://www.theguardian.com/technology/2021/sep/29/youtube-to-remove-misinformation-videos-about-all-vaccines> (Accessed: 3 January 2022).
- [57] Modes of transmission of virus causing COVID-19: implications for IPC precaution recommendations (2020) World Health Organisation. Available at: <https://www.who.int/news-room/commentaries/detail/modes-of-transmission-of-virus-causing-covid-19-implications-for-ipc-precaution-recommendations> (Accessed: 25 September 2024).
- [58] Møller, P. (2021) Ansæt på laboratorie i Wuhan kan være smittet af flagermus som den første, siger dansk WHO-chef, nyheder.tv2.dk. Available at: <https://nyheder.tv2.dk/udland/2021-08-12-ansat-paa-laboratorie-i-wuhan-kan-vaere-smittet-af-flagermus-som-den-foerste-siger-dansk-who-chef> (Accessed: 26 September 2024).
- [59] Morawska, L., Li, Y. and Salthammer, T. (2024) 'Lessons from the COVID-19 pandemic for ventilation and indoor air quality', Science, 385(6707), pp. 396–401. Available at: <https://doi.org/10.1126/science.adp2241>.
- [60] Morawska, L. and Milton, D.K. (2020) 'It Is Time to Address Airborne Transmission of Coronavirus Disease 2019 (COVID-19)', Clinical Infectious Diseases, 71(9), pp. 2311–2313. Available at: <https://doi.org/10.1093/cid/ciaa939>.
- [61] Morgan, J. (2021) Researchers raising Covid lab leak theory 'branded anti-science', Times Higher Education (THE). Available at: <https://www.timeshighereducation.com/news/researchers-raising-covid-lab-leak-theory-branded-anti-science> (Accessed: 8 February 2022).
- [62] Nix, N. and Wagner, K. (2021) 'Facebook Removed 20 Million Pieces of Covid-19 Misinformation', Bloomberg, 18 August. Available at: <https://www.bloomberg.com/news/articles/2021-08-18/facebook-removed-20-million-pieces-of-covid-19-misinformation> (Accessed: 3 January 2022).
- [63] Nogrady, B. (2024) 'WHO redefines airborne transmission: what does that mean for future pandemics?', Nature [Preprint]. Available at: <https://doi.org/10.1038/d41586-024-01173-7>.
- [64] Oral evidence: Reproducibility and Research Integrity, HC 606 (2021). House of Commons, Science and Technology Committee. Available at: <https://committees.parliament.uk/oralevidence/3211/pdf/>.
- [65] Oxford Scientists Slam Facebook For 'Censorship' Over COVID Mask-Wearing Article (2020) TMZ. Available at: <https://www.tMZ.com/2020/11/22/facebook-masks-oxford-masks-false-information-covid-coronavirus/> (Accessed: 14 September 2024).
- [66] Paget, A. (2021) Fury as leading respiratory doctor is BANNED from Twitter for 'misleading information', Daily Mail Online. Available at: <https://www.dailymail.co.uk/news/article-9625047/Fury-leading-respiratory-doctor-BANNED-Twitter-misleading-information.html> (Accessed: 25 September 2024).

- [67] Perry, T. (2020) How Facebook Is Using AI to Fight COVID-19 Misinformation, IEEE Spectrum. Available at: <https://spectrum.ieee.org/how-facebook-is-using-ai-to-fight-covid19-misinformation> (Accessed: 26 September 2024).
- [68] Pielemeier, J. (2020) ‘Disentangling Disinformation: What Makes Regulating Disinformation So Difficult? Symposium: News, Disinformation, and Social Media Responsibility’, Utah Law Review, 2020(4), pp. 917–940.
- [69] Potential Links between the Wuhan Institute of Virology and the Origin of the COVID-19 Pandemic (2023). Office of the Director of National Intelligence (ODNI). Available at: <https://www.dni.gov/files/ODNI/documents/assessments/Report-on-Potential-Links-Between-the-Wuhan-Institute-of-Virology-and-the-Origins-of-COVID-19-20230623.pdf>.
- [70] Proximal Origins Slack (2020) U.S. Right to Know. Available at: https://usrtk.org/wp-content/uploads/2023/10/Proximal_Origin_Slack_OCRd.pdf (Accessed: 27 September 2024).
- [71] Relman, D.A. (2020) ‘Opinion: To stop the next pandemic, we need to unravel the origins of COVID-19’, Proceedings of the National Academy of Sciences, 117(47), pp. 29246–29248. Available at: <https://doi.org/10.1073/pnas.2021133117>.
- [72] Reuters (2023) ‘Meta rolls back measures to tackle COVID misinformation’, 16 June. Available at: <https://www.reuters.com/technology/meta-rolls-back-measures-tackle-covid-misinformation-2023-06-16/> (Accessed: 25 September 2024).
- [73] Rindsberg, A. (2021) The Lab Leak Fiasco, Tablet Magazine. Available at: <https://www.tabletmag.com/sections/news/articles/lab-leak-fiasco> (Accessed: 26 January 2022).
- [74] Roadmap to improve and ensure good indoor ventilation in the context of COVID-19 (2021) World Health Organisation. Available at: <https://www.who.int/publications/i/item/9789240021280> (Accessed: 25 September 2024).
- [75] Robinson, N. (2022) ‘Why the Chair of the Lancet’s COVID-19 Commission Thinks The US Government Is Preventing a Real Investigation Into the Pandemic’, Current Affairs, 2 August. Available at: <https://www.currentaffairs.org/2022/08/why-the-chair-of-the-lancets-covid-19-commission-thinks-the-us-government-is-preventing-a-real-investigation-into-the-pandemic> (Accessed: 15 September 2022).
- [76] Sandlund, J. et al. (2023) ‘Child mask mandates for COVID-19: a systematic review’, Archives of Disease in Childhood [Preprint]. Available at: <https://doi.org/10.1136/archdischild-2023-326215>.
- [77] Schmidt, C. (2021) Did the coronavirus leak from a lab? These scientists say we shouldn’t rule it out., MIT Technology Review. Available at: <https://www.technologyreview.com/2021/03/18/1021030/coronavirus-leak-wuhan-lab-scientists-conspiracy/> (Accessed: 26 September 2024).
- [78] Schweitzer, J. and Kattwinkel, T. (2024) ‘RKI-Protokolle: “Heftiger Druck” von oben’, Die Zeit, 25 July. Available at: <https://www.zeit.de/gesundheit/2024-07/rki-protokolle-corona-pandemie-aufklaerung-bmg> (Accessed: 27 July 2024).
- [79] Seitz, A. and Dupuy, B. (2020) Debunked COVID-19 myths survive online, despite facts, AP NEWS. Available at: <https://apnews.com/article/debunked-coronavirus-myths-survive-212dfb8acbf8c759e869f8b391724873> (Accessed: 8 February 2022).

- [80] Shukman, D. (2020) ‘Coronavirus: WHO advises to wear masks in public areas’, BBC News, 5 June. Available at: <https://www.bbc.com/news/health-52945210> (Accessed: 25 September 2024).
- [81] Singman, B. (2021) Wuhan ‘lab leak’ coronavirus theory in focus as House Republicans demand answers, Fox News. Fox News. Available at: <https://www.foxnews.com/politics/wuhan-lab-leak-coronavirus-theory-in-focus-as-house-republicans-demand-answers> (Accessed: 8 February 2022).
- [82] Smerconish, M. (2021) ‘Did people or nature open Pandora’s box at Wuhan? | CNN’, 29 May. Available at: <https://www.cnn.com/videos/tv/2021/05/29/did-people-or-nature-open-pandoras-box-at-wuhan.cnn> (Accessed: 26 September 2024).
- [83] Stephens, B. (2021) ‘Media Groupthink and the Lab-Leak Theory’, The New York Times, 31 May. Available at: <https://www.nytimes.com/2021/05/31/opinion/media-lab-leak-theory.html> (Accessed: 22 June 2021).
- [84] Stevenson, A. (2020) ‘Senator Tom Cotton Repeats Fringe Theory of Coronavirus Origins’, The New York Times, 17 February. Available at: <https://www.nytimes.com/2020/02/17/business/media/coronavirus-tom-cotton-china.html> (Accessed: 8 February 2022).
- [85] Strauss, V. (2018) ‘Word of the year: misinformation. Here’s why.’, Washington Post, 10 December. Available at: <https://www.washingtonpost.com/education/2018/12/10/word-year-misinformation-heres-why/> (Accessed: 4 January 2022). Tackling online disinformation: a European Approach (2018). COM 2018 (236). European Commission. Available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0236&rid=2>.
- [86] Thaler, S. (2023) ‘Facebook removed COVID-19 posts under White House pressure: report’, The New York Post, 28 July. Available at: <https://nypost.com/2023/07/28/facebook-removed-covid-19-posts-under-white-house-pressure-report/> (Accessed: 25 September 2024).
- [87] The online information environment: Understanding how the internet shapes people’s engagement with scientific information (2022). The Royal Society. Available at: <https://royalsociety.org/news-resources/projects/online-information-environment/>.
- [88] Tilley, C. (2023) ‘Scientist who denounced Covid lab leak theory said privately it was “highly likely”’, The Daily Mail, 13 July. Available at: <https://www.dailymail.co.uk/health/article-12289007/Scientist-denounced-Covid-lab-leak-theory-said-privately-highly-likely.html> (Accessed: 25 September 2024).
- [89] Trust in institutions continues to fall in EU, despite declining unemployment and phasing out of pandemic restrictions (2022) European Foundation for the Improvement of Living and Working Conditions. Available at: <https://www.eurofound.europa.eu/en/news/2022/trust-institutions-continues-fall-eu-despite-declining-unemployment-and-phasing-out> (Accessed: 24 September 2024).
- [90] Turley, J. (2023) ‘COVID lab leak is a scandal of media and government censorship’, The New York Post, 26 February. Available at: <https://nypost.com/2023/02/26/covid-lab-leak-is-a-scandal-of-media-and-government-censorship/> (Accessed: 25 September 2024).
- [91] Vasist, P.N., Chatterjee, D. and Krishnan, S. (2023) ‘The Polarizing Impact of Political Disinformation and Hate Speech: A Cross-country Configurational Narrative’, Information Systems Frontiers, pp. 1–26. Available at: <https://doi.org/10.1007/s10796-023-10390-w>.
- [92] Victor, D. (2021) ‘YouTube suspends Rand Paul for a week over a video disputing the effectiveness of masks.’, The New York Times, 11 August. Available at: <https://www.nytimes.com/2021/08/11/business/youtube-rand-paul-covid-masks.html> (Accessed: 11 September 2024).

- [93] Wade, N. (2021) ‘The origin of COVID: Did people or nature open Pandora’s box at Wuhan?’, Bulletin of the Atomic Scientists, 5 May. Available at: <https://thebulletin.org/2021/05/the-origin-of-covid-did-people-or-nature-open-pandoras-box-at-wuhan/> (Accessed: 8 February 2022).
- [94] Weissman, M. (2024) ‘An Inconvenient Probability v5.6’, Michael’s Substack, 19 January. Available at: https://michaelweissman.substack.com/p/an-inconvenient-probability-v50?utm_campaign=post&triedRedirect=true (Accessed: 26 September 2024).
- [95] Wenstrup Releases Alarming New Report on “Proximal Origin” Authors, NIH Suppression of the COVID-19 Lab Leak Hypothesis (2023) United States House Committee on Oversight and Accountability. Available at: <https://oversight.house.gov/release/wenstrup-releases-alarming-new-report-on-proximal-origin-authors-nih-suppression-of-the-covid-19-lab-leak-hypothesis/> (Accessed: 26 September 2024).
- [96] Wenstrup Releases Statement Following Dr. Fauci’s Two-Day Testimony (2024) United States House Committee on Oversight and Accountability. Available at: <https://oversight.house.gov/release/wenstrup-releases-statement-following-dr-faucis-two-day-testimony/> (Accessed: 26 September 2024).
- [97] World Health Organization (WHO) [@WHO] (2024) ‘WHO Tweet dr Tedros’, Twitter. Available at: <https://x.com/WHO/status/1831343693040693267> (Accessed: 28 September 2024).
- [98] Zurcker, A. (2021) ‘Covid: Biden orders investigation into virus origin as lab leak theory debated’, BBC News, 27 May. Available at: <https://www.bbc.com/news/world-us-canada-57260009> (Accessed: 12 October 2021).

