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ESSAY

Medicine, Money, and Media: A Case Study of How the Covid-19 Crisis Corrupts Disclosure and Publishing Ethics

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HIGHLIGHTS

Two specific academic controversies suggest that financial conflicts of interest can distort research and influence evaluations of the COVID-19 pandemic.

ABSTRACT

We present a case study of corrupted discourses in medicine. Medicine is a fallible science. Therefore, it is not surprising that mistakes in the assessment of data and early closure of discourse have led to a highly biased view of the Covid-19 crisis. We present two examples of papers which were retracted following criticisms and republished after a lengthy re-reviewing process. One paper discussed the clinical benefits of COVID-19 vaccinations and the potential risk profile of these vaccinations using the Dutch Adverse Drug Reaction Register. The results of this study were not very favorable. The pressure mounted on the publisher of the journal *Vaccines* (MDPI, Basel) was huge, and the paper was retracted, although none of the classical reasons for retraction were present. The second paper was about carbon dioxide content in inhaled air under face masks in children, which revealed amounts of CO^2 inhaled under masks that violate accepted security norms by a factor of six. This paper was also retracted after criticisms were raised online and after a very dubious re-review process. A closer analysis shows that both retractions were politically motivated. We analyze these case studies and conclude that in the era of COVID-19, politics and financial incentives are increasingly replacing scientific discourse. The profit motive in scientific discourse has opened the floodgates to political influences. This makes obvious what has long been a problem: Financial conflicts of interest continue to distort research and play a major role in evaluations of the COVID-19 pandemic.

KEYWORDS

COVID-19, retraction, conflict of interest, publishing, ethics, peer-review.

INTRODUCTION

The appearance of the coronavirus SARS-CoV2 on the world stage at the end of 2019 (Gorbalenya et al., 2020; Ren et al., 2020; Zhu et al., 2020) and its denomination as a pandemic by the WHO on 11th March 2020 (Hua & Shaw, 2020; World Health Organization, 2020) can be seen as historic events. The SARS-CoV-2 pandemic not only created challenges for health systems around the globe. It also produced clefts within families, social groups, academia, political leadership, and it engendered

censorship in ways previously not encountered (Shir-Raz et al., 2022). We want to focus on the cleavage and faction that were produced in the academic world. Since most governments claimed that their actions were based on 'what science tells us', and on the 'evidence' derived from science, especially those in Western societies, it becomes mandatory to scrutinize, whether science can indeed be the unbiased arbiter so many people take it to be. To give a short answer: no, it cannot. The reasons for this are multifaceted, and we will provide some of them. Especially, we will present our experience with the publication of two critical articles which were seen by conflicted reviewers as 'trash' and withdrawn under political pressure, only to be later republished. This is a case study of science in 'real-time' operating mode. Our argument is, by necessity, biased by our own personal experiences and viewpoints. In the tradition of reflexivity as an important methodological guidepost in the social sciences, we are happy to lay them open up front, as much as we are aware of them.

The Mainstream Narrative about Covid-19

We were critical of the mainstream narrative at the outset, which comprised, among others, the following viewpoints:

There is a novel virus outbreak, SARS-CoV2. It comes from a zoonotic source, i.e., it is of animal origin and has jumped the barrier, now infecting humans. It is extremely dangerous because no immunity exists against it because it is highly infectious and produces a high infection fatality rate (IFR, i.e., the ratio of those who will die as a consequence of the infection in proportion to those infected). To prove this, the media presented us with anxiety-raising pictures of dying people, coffins, crammed hospitals, and a completely cordoned multi-million city, Wuhan, in China. The "killer-virus" meme was activated and various governments, certainly the German government, started to operate by raising people's fear level. Raising the fear level as one of the necessary measures was part of a Governmental briefing paper drafted in March 2020 and entitled "Learning from China" (https://www.bmi.bund.de/SharedDocs/downloads/DE/veroeffentlichungen/2020/corona/szenarienpapier-covid19.pdf?__blob=publicationFile&v=6, accessed 16th July 2021). This government paper suggested appealing to the fear of suffocation or by briefing the press with fear-directed messages only.

The dashboards that sprung up in various places counting fatalities and cases around the world contributed to the allegedly science-based information about epidemiological figures and spread. But the consequences were, among others, narrow territorial management strategies and promotion of anxiety (Everts, 2020; Wolf, 2022, pp. 103-117). Precisely because there is no immunity and the virus will infect each and every one if not prevented, it was stated very early that there is only one hope: rapid development and deployment of vaccines and until then harsh measures, called 'non-pharmaceutical interventions' (NPIs). For instance, German Chancellor Merkel stated in April 2020: Without a vaccination, the pandemic won't go away, and we would need NPIs (https://www.welt.de/politik/deutschland/article207167375/Merkel-zu-Corona-Solange-wir-keinen-Impfstoff-haben-wird-das-gelten.html, accessed 13/11/2023). Since traditional corona-virus vaccines have not been very effective in the past (Tseng et al., 2012), new technology would need to be employed, either vector vaccines that will transport immunogenic portions of the virus directly to cells via another, purportedly benevolent virus, or by modified messenger RNA vaccines that would program target cells to express the immunogenic parts of the virus, enticing the immune system to produce antibodies. Since normal vaccine development processes take at least four, more realistically, 6 to 10 years, there would only be a chance to get immunization to the people if we break our standards, forsake the normal sequence, and allow deployment before we have good safety data.

We identify a conglomerate of the following elements as part of the narrative, which we call the 'mainstream narrative', which we have also integrated into a questionnaire measuring the adherence to this narrative (Walach, Ofner, et al., 2022; Walach, Ruof, et al., 2021):

- A highly infectious agent with;
- A higher than usual IFR against which nobody is resistant because;
- No immunity exists, and hence;
- Severe NPIs are the only method to prevent the spread until;
- Novel vaccines are developed at high speed, even at the cost of safety.

We became critical of this mainstream narrative for different reasons early in 2020. Rainer J. Klement, a multidisciplinary natural scientist with a Ph.D. in physics, became suspicious about the media fear campaign, the denunciation of individuals questioning the mainstream narrative and its inherent reductionism completely ignoring self-responsibility and an intact immune system from the very beginning (Klement, 2020a, 2020b, 2020c). He also began to study test accuracy and noted that the PCR-test employed was too unspecific, producing too many false positives (Klement & Bandyopadhyay, 2020). Together with virological and other specialists, he queried

the solidity of the original PCR-test published by Drosten's group (Borger et al., 2020; Corman et al., 2020; Klement, 2020b, 2020c; Klement & Bandyopadhyay, 2020). This test was submitted on January 21st, 2020, accepted on January 22nd, and published on January 23rd, 2020, and hence probably holds the record in speeding through peer review of all scientific papers published.

Harald Walach, a health researcher active mainly in complementary aspects of health research, mindfulness, and some theoretical issues, is trained with a Ph.D. in clinical psychology and with a second Ph.D. in history and theory of science. He has conducted many experimental, clinical, and observational studies in the health field, taught methods classes, and has ample experience analyzing all kinds of data. He looked at the data that were publicly provided in Germany to check whether the public messages on TV and in print media were in consonance with the data. He discovered early on that the models which informed decision making (an der Heiden & Buchholz, 2020; Ferguson et al., 2020) made the crucial assumption that the IFR is comparatively high and that at least 70-80% of the population are susceptible. Using these assumptions, these models derived estimates of up to 2.5 million future fatalities for the US and 400,000 to 500,000 for Germany and the UK if no NPIs were put in place. He pointed out in Blogs and some smaller published pieces that the actual data do not fit the mainstream narrative (Kuhbandner et al., 2020b, 2022; Walach & Hockertz, 2020a, 2020b). Trying to raise this point with officials at the Robert Koch Institute in Germany, the official office of public health, or with state officers of the ministries of the interior or health was unsuccessful. Nobody wanted any dialogue, as the frontiers seemed to have been already established between those who "believed" the mainstream narrative and those who didn't. We did not.

A Note on the Fallibility of Medicine as a Scientific Discipline

The public, some medical researchers, and MDs often take medicine to be a 'science', in the sense that physics, chemistry, or engineering are sciences: based on sound and proven theories with clear models and quantitative predictions that can be empirically confirmed (or falsified depending on one's inclination towards Popper), with clear procedures and benchmarks to settle disputes about what is and is not true or evidence-based. Unfortunately, this view of medicine as a basic science is a myth. The reason is that medicine deals with humans who are complex and adaptive open systems, meaning that the causal processes acting on and within them strongly depend on the context, on differential genetic conditions and initial values, and cannot be explained by simply studying individual parts (Ahn et al., 2006; Greenhalgh & Worrall, 1997; Klement & Bandyopadhyay, 2019; Sturmberg & Martin, 2021). Simple, causal, and linear thinking is appropriate for emergency purposes in medicine, where it works well, for instance, when a broken leg has to be stabilized or bleeding has to be stilled. But in more complex situations, this simple logic fails.

This basically means that an intervention that works in one context may not work in another, or more generally, that no strict regularities and predictions are possible; at best, probabilistic predictions can be made that do not necessarily apply to an individual patient. Unfortunately, instead of acknowledging these limitations, medicine often behaves as if it deals with closed systems that are isolated from their environment. Theoreticians of medicine have now and again clarified that medicine is a practical discipline that makes use of insights from the natural sciences, as well as from other disciplines, but it isn't a natural science itself (Collins & Pinch, 2005; Loughlin et al., 2013; Meyer-Abich, 2010; Miles & Asbridge, 2014; Uexküll, 1995; Uexküll & Wesiack, 1988; Wieland, 1975). In the same vein, what works in medicine is less a matter of data only but also of experience, common sense, plausibility, and *horrible dictu*, economic interests (Abbasi, 2020; Gabbay & le May 2004; Gill et al., 2020; Gøtzsche, 2019; Ioannidis, 2018). How else would it be conceivable that a discipline in which probably less than half of all interventions are really based on scientific evidence (El Dib et al., 2007; Howick et al., 2022), a ratio that has not increased appreciably over the last decade (Howick et al., 2020), can function appropriately? Our recent meta-epidemiological study found that of 1,567 interventions randomly chosen from the Cochrane Database of Systematic Reviews – about a third of all interventions studied since 2008 – only 5.6% had solid, high-quality evidence of efficacy. There were indications for harm in 8% of all interventions. (Howick et al., 2022)

Medicalization of everyday life and the myth-making of modern medicine as the savior from sure impending death has led to a collective clouding of critical reasoning. For instance, while every new drug on the market is hailed by the public and media alike, the fact that side effects due to medications are the third leading cause of death in modern Western societies (Gøtzsche, 2013, 2015; Makary & Daniel, 2016) is not widely known and mostly ignored.

One of the most frequently cited papers in the modern medical literature is John Ioannidis' "Why most published research findings are false," meaning most *medical* research findings (Ioannidis, 2005). It is telling for the standing of a discipline that a paper critiquing its empiri-

cal base is one of the most frequently cited ones. It is seconded by Richard Horton's admonishing question, "*What is medicine's 5 sigma?*" (Horton, 2015). Here, the editor of *Lancet*, one of the leading medical journals, points out that there is no process of robustly defining a scientific "fact" within medicine comparable to physics, which uses the jointly replicated significance threshold of five standard deviations to accept something as proven. Perhaps Horton has read Ludwik Fleck, whose findings around thinking style and scientific collectives can be summarized into the adage: *A scientific fact is an agreement to stop thinking* (Fleck, 1979).

This construing of a fact that happened briefly during the swine flu pandemic that never was one; here, we see some of the patterns of medical fraud, including some 'experts' with large media coverage, financial conflicts of interest of leading authorities and biased media reporting (Keil et al., 2011). In our opinion, this example shows an uncanny similarity to today's Covid-19 crisis. Some individuals in Germany, such as Christian Drosten, the inventor of the first PCR test for SARS-CoV2, and some minor players that were on the cover of print and TV media nearly at a daily rate, commented on the making of the story. Some data were quickly concocted and often quickly put through the review process, published in respectable journals, they dominated the interpretative framework, and were taken up by the media.

A political spin was quickly added: those governments that were considered progressive, democratic, and representative of the Western model of enlightenment acted harshly and decisively. Thus, it was not only scientific evidence and truth that was at stake but political correctness. There were those who "believed" the official story, the mainstream narrative. This was propagated through all channels of public and print media and was only criticized by alternative internet media in the public domain. These were the predominant outlets for critics of the mainstream narrative. They were, in turn, blemished as 'right-wing', 'reactionary', or 'conspiracy theoretical' by self-appointed fact-checkers and alpha journalists (Krüger, 2013) in mainstream media. Thus, the critical discourse about the facticity of the mainstream narrative was sidelined and marginalized in news outlets, and even censorship was commonplace (e.g. https://www.aei.org/op-eds/missouri-v-biden-and-the-crossroads-of-politics-censorship-and-free-speech/; https://www.racket.news/p/in-missouri-v-biden-internet-censorship, accessed 13/11/2023). It became difficult even to hold diverging opinions in public without being personally attacked (Shir-Raz et al., 2022). A colleague of ours posted critical Tweets as Dr. John B. His Twitter account has been shut down after he reached some 60,000 followers and millions of visits (personal communication). He is a highly reputed scientist at an Eastern European university who has formed a critical consortium. This consortium operated anonymously because the universities had threatened to penalize all who uttered opinions divergent from the official line publicly.

In the scientific arena, something similar happened: The influential journals carried mainly pieces that transported and supported the official narrative, while critical data was often sidelined into second- or third-tier journals or saw a considerable delay in publication. Mainstream media outlets rarely reported on scientific data critical of the mainstream narrative. For instance, we criticized the influential paper of a working group of the Max-Planck-Institute in Göttingen that had justified the German lock-down-politics using wrong data (Dehning, Zierenberg et al., 2020). Our critique led to the group's admitting that their data was not adequate (Dehning, Spitzner et al., 2020; Kuhbandner et al., 2020a, 2020b). But none of the mainstream media in Germany took up this criticism. Until it was finally published two years later, four different review processes and three rejections passed (Kuhbandner et al., 2022). The same is true for the model that supported the beneficial effects of vaccinations (Watson et al., 2022): It was published in a high-impact journal. Our criticism was rejected as a Letter by various journals until it was published with more than a year delay (Klement & Walach, 2023). None of the German language mainstream media picked up on this criticism. These are, admittedly, personal experiences. But it seems that this pattern was quite universal: Mainstream media propagated the findings published in high-impact journals, while critical voices in the media were sidelined into novel internet media outlets, which were all too often the only ones reporting on critical findings that had mostly been published in second and third tier scientific journals.

Often, the counterargument is raised: If public opinion was not controlled and if an unrestrained discourse were allowed, political action would be diluted, the attempt to control the pandemic would be hampered, and lives would be at risk. We offer here a simple question as food for thought: If there had really been a deadly universal threat, would there not have been a comparatively quick agreement, both among scientists and the public? Is not the fact that a sizeable portion of both civil society and the scientific community hold diverging opinions a clear sign that something is wrong with the mainstream narrative? For instance, in our review of immunologists, a third of immunologists did not support this mainstream view, and a majority thought that the immune system and its competence were more important than the virus and its virulence (Walach, Ruof et al., 2021).

If a real threat were hovering outside, nobody would have to be told to remain at home or wear masks in public. They would know. Workers who go to work in indispensable jobs would have to be collected by police to do their work. We submit that the mere fact that there is a sizeable portion of the academic and civic community holding diverging opinions is a sign of the weakness of the mainstream narrative, which appears deeply flawed to some. For instance, quite early on, three highly reputed professors published the Great Barrington Declaration (https://gbdeclaration.org/, accessed 13/11/2023) on Oct 4th, 2020, which quickly had more than 50.000 signatories and, to date, carries more than 900.000 signatures. It was quickly dismissed by most mainstream media, its authors were character assassinated by some media, and the message went largely unheard.

The scandal is not that the flaw of the mainstream narrative is not seen by all. The scandal is that discourse about this flaw is not possible, not even among scientists. The instruments to prevent discourse are peer review, peer pressure, institutional penalization, fact bending, and outright lying by the media, as well as heavy pressure on journals not to publish opinions and facts that are dissenting (Shir-Raz et al., 2022). Another powerful instrument to penalize dissenting opinions and incentivize conformity is retractions (Elisha et al., 2022). We report and analyze below two case studies of our own research being retracted.

Case Study 1: Retracted: Walach, Klement & Aukema (2021)

Harald Walach and Rainer J. Klement made contact with Wouter Aukema, who is an independent data analyst. He started to analyze the side effects database of the European Medicine Agency when side effects of the new COVID-19 vaccines were published beginning in 2021 and posted his findings on Twitter. We decided to analyze these data more formally.

Let us remember: The normal sequence of vaccination (and medication) regulation in Germany and elsewhere was informed by the thalidomide scandal in Germany in the 1960's. Thalidomide, brand name Contergan, was marketed as a sedative, pain killer, and sleeping pill, in general, but also especially for pregnant women by the German company Chemie-Grünenthal (Ridings, 2013). If taken during a specifically sensitive time of development of the fetus during pregnancy, it causes deformities in the growth of extremities. Many children were stillborn or died early, with estimates assuming that 40% of those damaged died (Stachowske, 2014). It took many years, court cases, and political campaign pressure until this was acknowledged, compensations paid, and as a consequence, the regulation of new pharmaceutical agents changed for medicines and vaccines alike. It now includes pre-toxicology screenings in animal models, during which new substances have to prove that they are not toxic, are not carcinogenic, and cannot produce gene defects and abnormalities in the offspring. Only if that is proven phase 1 trials of safety in humans are initiated, then small phase 2 trials of clinical efficacy and finally pivotal phase 3 trials of clinical effectiveness in large groups of patients, large enough to demonstrate differences against controls with statistical significance. Most novel agents are then submitted to compulsory post-marketing surveillance studies during which the safety in general practice is documented.

This procedure has been suspended for COVID-19 vaccines with the argument that the pandemic situation and its associated threat demand swift action (Arvay, 2020). Consequently, no solid safety data exists to this point. The fact was ignored that similar vaccines against SARS had produced severe side effects (Tseng et al., 2012) such that their development was aborted. A new procedure was invented: telescoping, to conduct all phases of vaccine developments in parallel. Thus, no safety data existed when clinical phase 3 trials started. When the first trial of the mRNA vaccine developed by BioNTech and marketed by Pfizer was published (Polack et al., 2020), Harald Walach asked Judith Absalom, the corresponding person at Pfizer, whether there were safety data. She answered "not yet" at the time (email to Harald Walach). Meanwhile, such data are being published, and they do not instill confidence in the vaccines' safety (https://dailyclout.io/category/pfizer-reports/, accessed 13/11/2023). Also, scientists and public health activists have freed up information via Freedom of Information Act inquiries and made the data public (https://phmpt.org/pfizer-16-plus-documents/, accessed 13/11/2023).

RNA and vector vaccines use novel techniques that have been around for a while but never saw the light of an economic day because they were not in any way superior to conventional techniques. In essence, they are genetically based techniques. In a conventional vaccine, a pathogen or relevant parts of it are presented to the immune system in a less pathogenic form, usually together with some immunogenic substance such as aluminum hydroxide, inducing an immune reaction. In contrast, with these new products, the RNA of the pathogen, in that case, encoding for the spike protein of the SARS-CoV2 virus, is directly inserted into human cells in a modified version (Sahin et al., 2014). This is achieved either via messenger RNA transported in nanoparticles that then is incorporated by the ribosomes, instructing them to pro-

duce the spike protein, which in turn induces an immune reaction, or via a viral vector that deposits the RNA of the virus in the cytosol of the cell, where it is transcribed into DNA and transported to the nucleus such that the spike protein is then produced. Thus, it would be more correct to term this type of intervention "preventive gene therapy", and not vaccination. So far, we only have a theory to go by, whether this model works. The theory sounds rational and clever. The antibody-inducing properties of these procedures are proven but also not very surprising, considering the fact that these vaccines contain a multitude of micro impurities, from human to animal proteins to various kinds of nanoparticles (Kowarz et al., 2021; Krutzke et al., 2021; Seneff & Nigh, 2021).

But what we do not know is: How safe are these procedures? Again, we emphasize that there is no long-term safety data. Meanwhile, the ones we have are from comparatively small (about 20,000 participants) regulatory trials with cohorts not representative of the population that are being given those vaccines. Two recent analyses of regulatory data concluded that the vaccines produce more side effects than they prevent severe COVID-19 disease cases (Fraiman et al., 2022; Mörl et al., 2022). In addition, ethical concerns about short-term trial data have also been raised (https://dailyclout.io/pfizer-process-2-vaccine-had-2-4-times-adverse-events/, accessed 13/11/2023).

The only way safety can be gauged prospectively for the time being is through the adverse drug reaction (ADR) databases of regulators. These databases collect ADRs that are reported by market authorization holders, i.e., the companies that market products. These companies are legally bound to report ADRs. In addition, self-reports of patients and doctors exist in most countries. We know that this system has drawbacks, and empirical studies of the completeness of these registers found that underreporting in such registers is between 60% and 80% and can be as high as 95% (Alatawi & Hansen, 2017; Hazell & Shakri, 2006; Moore & Bennett, 2012).

This is where our study started. We sought to gauge the benefits and parallel them with the risks. In order to estimate the benefit, we calculated the Number Needed to Vaccinate (NNTV) to prevent one death from a large Israeli field study (Dagan et al., 2021) that had studied more than a million participants, half of whom had received the BioNtech m-RNA vaccine and half of them were as yet unvaccinated. The observation period was only four weeks, and ideally, one would need a much longer period. However, these data simply did not exist at the time. In order to establish the NNTV, one needs to know the absolute risk difference. That is the risk, calculated as the number of events, in our case deaths, standardized on the number of participants in the control group and subtract the risk per participants in the treated group. This figure is the absolute risk difference, which is a clinical effect. It is different from the relative risk ratio, which is the ratio of risk in the control group to the treated group, which yields the effectiveness of the vaccine. This is usually high, around 95% for different vaccines. But as the events – symptomatic illness or death – are rare events because the prevalence of SARS-CoV2 infections has always been comparatively low, one has to vaccinate many people before one event can be prevented.

This crucial point was mentioned by Olliaro and colleagues (Olliaro et al., 2021), who calculated that the study by Dagan and colleagues allows a robust calculation of the NNTV in the face of the data from the regulatory phase 3 trials. We used this Dagan et al. study to calculate the NNTV to prevent one death. The NNTV is simply the reciprocal of the absolute risk difference. And for the BioNTech vaccine, it was at the time roughly 16,000. This means that 16,000 persons would have to be vaccinated in order to prevent one COVID-19-related death. Meanwhile, we have a somewhat better database from the six month regulatory trial of the BioNTech/Pfizer vaccine (Thomas et al., 2021). There, in supplementary Table 4, death is mentioned as an additional outcome. While two Covid-19-related deaths are mentioned in the control group of 21,921 participants, one Covid-19-related death was observed in the BioNTech group (n = 21,926). The observation period is now six months, i.e., long enough to cover what we now know is the period during which the vaccination confers a protective effect (Nordström et al., 2021). Thus, we see one death prevented in about 20,000 persons vaccinated or five deaths in 100,000 persons vaccinated. This is pretty close to our original estimate. (Walach, Klement, et al., 2022) However, the populations studied in those vaccination regulatory trials were not representative of the population at risk for COVID-19 but rather biased towards younger and healthier groups.

We then investigated the ADR database of Lareb, the Dutch health authority. We used this because we discovered that within the ADR database of the European Medicine Agency (EMA), there was a huge variability between the countries, with Poland reporting 15 side effects per 100,000 vaccinations and the Netherlands 701. Obviously, the Dutch data adhere to a better reporting standard (we dismissed the argument that the vaccine might affect different countries differently). Also, Lareb stated on their website that all reports are vetted by investigators. Using these data, one can calculate that during the time of our analysis in July 2021, we saw 4.11 fatalities per 100,000 vaccinations and about 16 severe side effects. It is clear that there is no causality attributable to these data. How-

ever, a strong association can be attributed. Otherwise, market authorization holders, doctors, and patients would not report. If one puts these two data sets in relation, also including the somewhat better figures of the phase 3 regulatory trials, one sees that 100,000 vaccinations save six to 32 lives, but at the same time, four fatalities are reported in association with these vaccinations. Thus, the risk-benefit ratio was 2:3 to 1:8 at the time. The longer observation period of the six month trial vindicated our original estimate (Thomas et al., 2021). Of course, we need to study causality carefully. This is impossible using such registers. The registers give a safety signal, which then needs to be investigated, ideally in a large cohort study of perhaps one million vaccinated people that are closely monitored by independent medical personnel for novel symptoms, side effects, etc. It is difficult to understand why the marketing authorization and clinical trials were sped through the regulation process, but no associated safety studies seem to have been inaugurated.

It is worth mentioning that an analysis of the CDC VAERS database has reached a similar conclusion: 3.4 deaths per 100,000 vaccinations (Rose, 2021). Looking at VAERS, the deaths reported there in association with COVID-19 vaccines are by roughly a factor of 100 more numerous than those with all other vaccines standardized on time (Seneff et al., 2022). We thought this should give us pause and be an incentive to install an active safety monitoring system. At the time of this analysis, the clinical trial register https://clinicaltrials.gov/(accessed July 18th, 2021) showed over 500 entries regarding clinical phase 3 trials of efficacy and safety but no single large-scale post-marketing surveillance study of side effects. There is a large European multicenter efficacy monitoring study which, however, does not include safety monitoring (https://www.ecdc.europa.eu/en/publications-data/interim-analysis-covid-19-vaccine-effectiveness-against-severe-acute-respiratory, accessed 2nd February 2022). It was in that vein that we published our paper (Walach, Klement, et al., 2021a) that, admittedly, used some harsh language to drive the message home:

We are in the midst of the largest vaccination and medical experiment ever conducted on mankind without having adequate safety data and without proper informed consent. Proper informed consent cannot be sought nor given because we do not know the risks associated with the intervention.

If one uses the data we have, which are bad data and much too short-term and unsystematic, the risk-benefit analysis is very unfriendly. In our view, this would seem to potentially call a halt to the vaccination campaigns and would surely have to trigger a careful safety analysis by independent experts; at the least, it should instigate a concomitant *active* monitoring study in addition to the passive systems in place. In an active monitoring system, a defined large enough cohort would be followed up prospectively over a certain time period. This has been demanded by many authors but has not been implemented. Hence, we can only use the pharmacovigilance data of those databases as a proxy (Lyons-Weiler, 2021).

This was the gist of our paper. Admittedly, we did not word our claim carefully enough. In some passages, one might construe our claim as attributing causality to the deaths associated with the vaccines in the pharmacovigilance data. As the editor of the journal who republished our paper observed: if we cannot use the data of the pharmacovigilance data-bases to make at least tentative ascriptions of potential causality, then the concept of pharmacovigilance itself is void (Lyons-Weiler, 2021). However, we did make it clear in the Discussion that the ADR is an associative piece of data and does not allow for causal claims. Also, we conceded that the benefit might increase with time, thus improving the ratio. But we do not know this because we did not have the data at the time. With hindsight, this risk-benefit ratio did not improve (Bardosh et al., 2022; Emani et al., 2022; Fraiman et al., 2022; Franco-Paredes, 2022; Mörl et al., 2022)

Our paper was reviewed by three reviewers. They were allowed to mention their names, and as far as we can see, one of the reviewers was one whom we suggested. The other two were unknown to us, remained anonymous, and were obviously chosen by the editor. The one chosen by us made very helpful remarks, pointing out some mistakes and typos and suggesting improvements, all of which we incorporated. The other reviewer, unknown to us, praised the paper as a long-overdue analysis. He or she suggested even some stronger wording and some additional references, all of which we incorporated. The third reviewer was a bit critical but had nothing severe to criticize. He or she also appears to have not closely read our paper, as the person suggested things that we had actually performed, such as using a local database (we did use the local Dutch database). We incorporated all other suggestions. The editor accepted our paper.

Four days later, we received a note from the editorial office that an expression of concern had arrived. This concern was raised already the day following publication. It came from Prof. Eugène van Puijenbroek, the head of pharmacovigilance at Lareb. It raised the concern that we had illicitly used the ADR database of Lareb to draw causal inferences and stipulate that the reports are causally connected to the vaccine, which cannot be done because they are simple, unchecked reports only. He claimed in this letter that these reports come from patients and doctors only, while in another piece he had authored for

'*Regulatory Science*' the same year, he says that the database contains 58% of ADR reports entered by market authorization holders (https://www.regulatoryscience.nl/editions/2021/12/prof.-dr.-eugene-van-puijenbroek-on-the-nature-of-signals; accessed 29th June 2021). Either his allegation that only reports from patients and doctors went into the LAREB Covid-19-vaccine database is wrong, or there are different standards for vaccines compared to other medicinal products. The other point raised was that the data are not vetted, as we assumed their web entry to mean 'by medical specialists'. We were asked to answer this concern and did. The text of our rebuttal and that of our response to the retraction was only published by Retraction Watch (https://retractionwatch.com/2021/07/02/journal-retracts-paper-claiming-two-deaths-from-covid-19-vaccination-for-every-three-prevented-cases/, accessed 16th July 2021), not by the Journal.

In the meantime, the journal *Science* (https://www.sciencemag.org/news/2021/07/scientists-quit-journal-board-protesting-grossly-irresponsible-study-claiming-covid-19; accessed 11th July 2021) made public that six editors (of some 350) of the journal *Vaccines* had threatened to resign or had already resigned as a consequence of this journal's publishing our paper. These resignations had partially been announced on Twitter, where one of the editors said he had resigned, reacting to a Tweet asking how 'this piece of shit' got published. It can be safely assumed that it was this pressure that led to the Journal's retraction decision. Whether other pressures were exerted, for instance, by the Bill and Melinda Gates Foundation (BMGF), which funds the Journal through paying the publishing fees for their authors and receives access to the online submission system of the publisher (https://www.mdpi.com/about/announcements/1415, accessed 11th July 2021), will likely never be known and remains an informed speculation.

These pressures led to a retraction a couple of days after the paper was published. Until then, it had 100,000s of views and many downloads. After the retraction, we received quite a few letters of support from reputed scientists. One editor of the journal who wanted to remain anonymous expressed "dismay" about the journal's handling of this case, as did many others.

In our responses to the retraction, published by Retraction Watch, we pointed out that in the Publisher's Code of Ethics (https://publicationethics.org/files/cope-retraction-guidelines-v2.pdf, pages 3-4, accessed 11th July), which this journal (as most journals) subscribes to, there is a tight regulation for retractions. A retraction is warranted if:

- A paper makes fraudulent claims based on wrong or fabricated data – this does not apply.
- A paper makes false claims based on an analysis that is wrong – this does not apply; never was any criticism raised against the analysis.
- A paper is a piece of plagiarism, self- or other plagiarism – this does not apply either.

In all other cases, corrective action is warranted: an addendum, an amendment, an editorial remark, or perhaps even an amended version, which is easy to generate with online publishing. Thus, we conclude that the retraction was politically motivated and scientifically unwarranted and, hence, has to be seen as an instrument for sidelining critical voices. As a consequence, Poznan Medical University, where Harald Walach held half a teaching position, announced via Twitter on June 30th, 2021 that it had terminated the affiliation, which, in fact, meant that it had not extended a contract that was running out that day anyway, and was in the pipeline for an extension. As another consequence, the second University, Witten/Herdecke University, where Harald Walach held a visiting professorship teaching philosophical foundations of psychology to undergraduate students, also revoked the affiliation.

We resubmitted the paper. It went through another single-blind peer-review process with three independent reviewers and multiple cycles of editing and is now available again (Walach, Klement et al., 2021b). We smoothed the wording. The analysis still stands. So does the challenge.

Case Study 2: Retracted: Walach, Weikl, Prentice, Diemer, Traindl, Kappes & Hockertz (2021)

The paper "*Experimental assessment of carbon dioxide content in inhaled air with or without face masks in healthy children: A randomized clinical trial*" was a study where we measured carbon dioxide content in inhaled air in 45 healthy volunteer children (aged 6 to 17) (Walach, et al., 2021). The study started with an initiative by parents to measure carbon dioxide levels under face masks worn by their children. After two school boards had rejected their requests, they approached us, and we set out to do our own study. Dr. Helmut Traindl, an oathbound, court-approved measurement specialist in indoor gas measurement, conducted the measurements using new equipment. The design was an intra-individually controlled experimental study with a baseline measurement, followed by two measurements under a surgical and an NP95/FFP2 respirator in counterbalanced order, followed by a post-baseline comparison. Measurements were conducted by a tube fixed to the upper lip of the child and ini-

tiated by a physician observing the child's breathing pattern, such that only inhaled air, exhaled air, or both were measured in separate steps. The measurements revealed high carbon dioxide content in inhaled air of more than 13,000 ppm after only three minutes, where 400 ppm is what we breathe in outside, and roughly 1,500 ppm inside, with 2,000 ppm being the safety level for children and pregnant women, as well as for workers under masks after 90 minutes.

The study was published as a short 600-word Letter by *JAMA Pediatrics* after three rounds of review by three experts in addition to the editor. Technical material had to go into a supplement, which had a word limit of 1,500 words, and we submit that some details that were contained there should have gone into the main body of the letter. The paper attracted quite some interest, as it was the only one of its kind at that time. Also, some critical comments were posted on *JAMA*'s website. These comments were sent to Harald Walach as the corresponding author. They were answered in good time. After about three weeks, a note of concern was sent by *JAMA* editorial office, this time by another editor. A comparatively short time frame of three days was given for answering these concerns and questions ("by Friday business closing time"), and it was indicated that a review of the concerns and our answers would follow.

The next Monday, noon European time, i.e., morning business opening time on the East Coast, the answer came from the *JAMA* editorial office stating that the internal re-review had found that our answers were not sufficient, that a new review had reached them and as a consequence, the paper would be retracted. The paper was published on June 30th, 2021. The first concerns were commented on on the 5th of July 2021. On the 21st of July, we were notified of the concerns and asked to reply by July 23rd. Sometime in between, either initiated by the journal or unsolicited, a new review must have reached the journal. Although we had asked to see this additional review twice, it was not sent to us, and emails to the *JAMA* editorial office remained unanswered. Whether the editorial office went into a conclave over the weekend to ponder the review and our answers will remain the secret of *JAMA*.

Until October 2022, the paper had been viewed more than half a million times. The comments that were raised online after publication made it clear that most of them were misunderstandings or due to the fact that readers had either not accessed the supplementary material that contained technical details, or if they had accessed some of it, they had looked at wrong data-sheets and hence had made wrong conclusions about the suitability of the measurement devices used. For instance, some commentators said we should have used capnography to measure carbon dioxide content instead of measuring carbon dioxide in the inhaled air directly. This is a little bit like saying if you want to measure the air pressure on top of a high-rise building, you should not use a barometer but measure the height of the building and, convert the height into the pressure difference and deduce it from the pressure you measure at the ground level. Possible, but not necessarily the most direct way. Other commentators had not understood the rationale of the measurements and might have overlooked a crucial piece of information, namely that the different breathing phases were manually checked by observing the breathing patterns of the child. In that vein, comments that were mainly due to misunderstandings, misreadings, and a lack of care when looking at the information provided amounted to a seemingly important argument against the validity of our measurements.

The speedy re-review process, the short deadline of only three days for answering complex questions – our answers were given in a commentary of some 6.000 words length, the alleged second review, which was never forwarded to us, the silence of the handling editor and the take-over of the process by someone higher up in the chain of command with *JAMA*, the lack of substance of the points raised, all this suggests that this was not a proper scientific process of finding fault and therefore retracting data, but of getting rid of something politically improper.

This was underlined by a 'fact-check' conducted by official public German TV (ARD) on its website, which denounced the study as unreliable. The fact check was conducted by a reporter who is known for reporting on horse-sporting events. Whether this qualification is sufficient to judge a scientific paper remains for readers to decide. It contained numerous errors, among others, the statement that the paper was not peer-reviewed. The German outlet *Deutsche Ärztezeitung* carried a political commentary using this fact-checking piece as a basis to denounce the findings, perpetuating the wrong assertions that the measurements were not valid. This type of character assassination is quite typical: A factually questionable fact-check is conducted by people with less-than-adequate qualifications who are being elevated to arbiters in highly complex questions. This verdict is then used by numerous campaigners or other media outlets that are more authoritative to speak a word of condemnation, which disqualifies the research and its authors.

The factual accusations were dispelled by the reviewers of the long version of the paper (which would have been available via pre-prints to readers of the short version as well), who seemed to have understood the rationale and the measurement of the study and hence

allowed its re-publication in the long version, which was published on May 28, 2022 (Walach, Traindl et al., 2022).

Observation: Conflict of Interest and Money

We observe that some of the editors who demanded a retraction of our *Vaccines* paper are heavily conflicted. One of them is among the group that developed the vector vaccine in Oxford. One of them received a very big grant from the BMGF, and one of his postdocs has recently gone on to work for Moderna, the other developer of an mRNA vaccine against COVID-19. Another editor has also received BMGF grants. Another is high up in the hierarchy of the School of Public Health with the University of Maryland, the very institution that publishes a prominent COVID-19 dashboard and receives funding for it from GAVI. The others we have not checked out. We mentioned the sponsorship agreement between the publisher of the Journal, MDPI, and BMGF. Whether these connections lead to a direct chain of command of pressure or just to scissors in the head that cut out controversial thinking, we leave it to the readers to decide. But conflict of interest is an important element in seemingly rational choices (Angell, 2005, 2008; Brennan et al., 2006).

How conflict of interest has distorted our knowledge in medicine has been well documented. Making one's conflicts transparent is a first step. But it is also misleading because people think that conflicts laid bare are irrelevant. Much more relevant are the allegiances to world models and background assumptions that are rarely conscious. The philosopher Collingwood (1998, orig. 1940) termed these "absolute presuppositions." They shape our perception of the world. They inform our evaluations. And they cannot be easily changed or got rid of. The only chance we have is becoming conscious of them and becoming conscious of indoctrination. The road to becoming conscious of unwarranted preconceptions is open discourse.

This would actually be the task of scholarship and science. We observe that science has begun to be an acolyte of a new religion, the religion of scientism (Milgrom, 2021; van Fraassen, 2016; Williams & Robinson, 2016), and possibly also the project of trans-humanism (Bishop, 2010; Harari, 2017; Pinker, 2018; Sorgner, 2010; Wiley, 2022). The COVID-19 crisis brings this surreptitious equation of science with scientism and transhumanism to the fore. The new sacrament is the syringe that brings back freedom and a normal life. It is uncritically hailed, and whoever disturbs the ceremony, such as us, is a heretic who can be hunted down because he disturbs the Holy Mass. This is all in the name of 'saving lives'. But the neglect of safety factors shows, in our view, that the real agenda is not saving lives but introducing a new medical technology at all costs. Apart from that, had "saving lives" been the agenda, the pivotal trials would have to have used mortality as an outcome and not symptomatic COVID-19 disease, as they factually have.

This new technology brings a huge financial benefit to those who develop the vaccines, those who hold the patents, and the other stakeholders. The company that produced the mRNA vaccines in Germany, BioNTech, was technically broke before Bill Gates infused money into the company in October 2019. Two years later, it was worth several billion Euros. The mRNA technology is also a platform that can be used for deployment for other vaccines and medications. It had been studied in a government-sponsored research project some years earlier and was aborted because it was found that it violated two important principles of pharmacology: it was unclear and not actively controllable where the end product would be produced and in what dose (Stefan Hockertz, former director of Fraunhofer Lab responsible for this research, personal communication to HW).

We submit: had it not been for the pandemic, the uncritical media-support campaign, and the high fear level instilled into the public by that campaign (Bendau et al., 2021), this technology might not have seen the light of regulatory approval at all.

Observation: Political Correctness, Media, and Pre-Emption of Lawsuits

Some commentators of our children-mask study were obviously just provoked because our study challenged the wisdom of mask-mandating for children. While it has now been mostly accepted that children are in no danger of contracting the disease and do not drive infections (Brandal et al., 2021; Dowell et al., 2022; O'Driscoll et al., 2021), the fear level among teachers and parents has resisted the revoking of mask mandates for a long time, despite the fact that our study has given a rationale to the widely reported symptoms of tiredness, fatigue, depression, and headaches, among others (Schwarz et al., 2021). Although the side effects of mask-wearing are much better documented (Kisielinski et al., 2021) than its benefits (Jefferson et al., 2020), although our measurements of 13,000 ppm carbon dioxide in inhaled air make clear why this is the case, there was widespread refusal to accept this fact. The reasons given were that children would be put in danger due to our study and that policies would have to be changed drastically. Indeed, even lawsuits might ensue if parents saw how rather baseless regulations violated a basic right, the right to breathe. Here, we observe that assent to a narrative, in that case, the mainstream narra-

tive about COVID-19, seems to be a more important driver than rational and fact-based information.

This is the result of a political correctness culture, whereby a certain interpretation of the world has been linked up with political factions – in the US, Democrats are more in line with the mainstream health narrative than Republicans; in Europe, Covid-19 critics being equated with right-wing ideology, "anti-vax" positions, and irrational and irresponsible people in general.

For instance, one commentator observed that some members of the team that conducted the mask study were members of MWGFD, "an anti-vaxxer campaign group." This is a gross distortion. MWGFD is shorthand for, translated, "Doctors and Scientists for Health, Freedom and Democracy (Mediziner und Wissenschaftler für Gesundheit, Freiheit und Demokratie", a charitable trust that formed in the wake of Covid-19 restrictions to critically assess these political measures. Indeed, HW, as well as some of his co-authors, is a member. Using this affiliation as an argument to retract a study would be tantamount to asking all pharmaceutical studies to be retracted because all these authors believe in the usefulness of pharmaceutical interventions.

This political correctness culture has to do, we suppose, with the world becoming more complex. This goes together with the fact that those who used to pre-sort this complex situation, namely specialists in the media, have become fewer, and more of them are working within precarious contracts. This leads to a lack of professionalism, to short-lived and little-reflected papers to please what is perceived as the majority view, both in the editorial offices and in the public. Strong section editors, who are independent because they have a lifetime contract, are a rare commodity these days. One of us (HW) has conducted interviews with various experts. Media experts all lament the fact that the funding of mainstream print media has been reduced by the diversion of advertising funds to internet media, and the classical print media are dependent on political funding. Hence, they crawl closer to the political caste, sensing what is politically feasible and correct. Thereby, they corrupt what has been the most important task of the press: to critically accompany political discussions. Media have become campaigning instruments for majority views instead of instruments of critical discussion and correctives for unhealthy monopoly building and the industry or NGO-funded think tanks.

It should not be forgotten: Had mandates been challenged by science on a broader front, lawsuits might have followed that could have hampered both the financial viability of some actors and the political credibility of decision-makers, parties, and even whole systems. Thus, political systems were highly motivated to prevent this from happening. Does this mean that there was direct collusion to attack dissenting opinions by retractions? Not necessarily. Some self-organization processes along the lines of the ruling paradigm, the majority view, and the mainstream narrative might be sufficient to understand what happened and how it came to be (Desmet, 2022). For instance, the German Max-Planck Institutes are state-funded. It is not surprising that some of the weakest research, which supported governmental decisions but was demonstrably wrong, came from there (Dehning, Zierenberg et al., 2020; Kuhbandner et al., 2022).

What we can, therefore, conclude is that the pandemic has provided a vivid illustration of the ways in which scientific discourse has broken down. Unwanted and unpopular ideas and findings cannot be accepted as such and countered by counterargument, counter-fact, and counter-analysis, it seems, but they have to be ushered out of the room lest they disturb the party. What could be remedial? We suggest that officials in universities, in the public sphere, in the media should stand up to and face their fear of coordinated attacks via social or other media and cultivate a conscious culture of discourse, actively seeking and supporting dissenting opinions. It is only through actively and willingly engaging with such dissent that a stable and socially affirmative consensus can be reached.

We think that the consequences of conflict of interests should be researched much more broadly, perhaps through public programs to sensitize people to the devastating effects of such conflicts on the culture of discourse. Universities should revisit their rationale for being. This is not to produce obedient working ants for the production process but people who are able to think critically and also to be able and willing to oppose societal trends that are dangerous for freedom, human rights and historically achieved benefits, such as freedom of speech, freedom to decide on one's life trajectory, to choose medical treatment or forego it, etc. In that vein, universities have an obligation to not only harbor thinkers who dissent but also to actively support them instead of firing them or making their lives difficult. In Germany, we have observed that it is mainly the younger generation, students, and often young academics that are vigorously opposed to open debates in the name of political correctness. A cancel culture ensued, where speakers or discussants who would not support the mainstream view were either not invited or disinvited after social media shit-storms followed an announcement of a debate or a lecture series. It is the task of the senior management in universities and elsewhere to not bow to the pressure of public opinion. After all, it was the pressure of streets that led to some very dire political consequences in the

last century, and we should prevent this from happening again. The Covid-19 crisis showed how close we are to similar circumstances all around the world. We may be wrong, but without an active discourse, we will never know. Short-circuiting discourse, canceling unwanted opinions, and drowning voices of opposition in a roar of political correctness are the high road to fascism.

REFERENCES

Abbasi, K. (2020). Covid-19: politicisation, "corruption," and suppression of science. *The BMJ, 371*, Article m4425. https://doi.org/10.1136/bmj.m4425

Ahn, A. C., Tewari, M., Poon, C.-S., & Phillips, R. S. (2006). The limits of reductionism in medicine: Could systems biology offer an alternative? *PLoS Medicine, 3*(6), Article e208. https://doi.org/10.1371/journal.pmed.0030208

Alatawi, Y. M., & Hansen, R. A. (2017). Empirical estimation of under-reporting in the U.S. Food and Drug Administration Adverse Event Reporting System (FAERS). *Expert Opinion on Drug Safety, 16*(7), 761-767. https://doi.org/10.1080/14740338.2017.1323867

Angell, M. (2005). *The truth about the drug companies: How they deceive us and what to do about it*. Random House.

Angell, M. (2008). Industry-sponsored clinical research: A broken system. *JAMA, 300*(9), 1069-1071. https://doi.org/10.1001/jama.300.9.1069

an der Heiden, M., & Buchholz, U. (2020). Modellierung von Beispielszenarien der SARS-CoV-2-Epidemie 2020 in Deutschland.

Arvay, C. G. (2020). Genetische Impfstoffe gegen COVID-19: Hoffnung oder Risiko. *Schweizerische Ärztezeitung, 101*(27-28), 862-864. https://doi.org/10.4414/saez.2020.18982

Bardosh, K., de Figueiredo, A., Gur-Arie, R., Jamrozik, E., Doidge, J., et al., (2022). The unintended consequences of COVID-19 vaccine policy: Why mandates, passports and restrictions may cause more harm than good. *BMJ Global Health, 7*(5), Article e008684. https://doi.org/10.1136/bmjgh-2022-008684

Bendau, A., Petzold, M. B., Pyrkosch, L., Mascarell Maricic, L., Betzler, F., et al., (2021). Associations between COVID-19 related media consumption and symptoms of anxiety, depression and COVID-19 related fear in the general population in Germany. *European Archives of Psychiatry and Clinical Neuroscience, 271*(2), 283-291. https://doi.org/10.1007/s00406-020-01171-6

Bishop, J. P. (2010). Transhumanism, metaphysics, and the posthuman god. *Journal of Medicine and Philosophy, 35*, 700-720. https://doi.org/10.1093/jmp/jhq047

Borger, P., Malhotra, R. K., Yeadon, M., Craig, C., McKernan, K., et al., (2020). External peer review of the RTPCR test to detect SARS-CoV-2 reveals 10 major scientific flaws at the molecular and methodological level: Consequences for false positive results. *Zenodo,* Article 4298004. https://doi.org/10.5281/zenodo.4298004

Brandal, L. T., Ofitserova, T. S., Meijerink, H., Rykkvin, R., Lund, et al., (2021). Minimal transmission of SARS-CoV-2 from paediatric COVID-19 cases in primary schools, Norway, August to November 2020. *Eurosurveillance, 26*(1), Article 2002011. https://doi.org/10.2807/1560-7917.ES.2020.26.1.2002011

Brennan, T. A., Rothman, D. J., Blank, L., Blumenthal, D., Chimonas, S. C., et al., (2006). Health industry practices that create conflicts of interest: A policy proposal for academic medical centers. *JAMA, 295*(4), 429-433. https://doi.org/10.1001/jama.295.4.429

Collingwood, R. G. (1998, orig. 1940). *An essay on metaphysics* (revised ed.). Clarendon Press.

Collins, H., & Pinch, T. (2005). *Dr. Golem: How to think about medicine*. University of Chicago Press. https://doi.org/10.7208/chicago/9780226113692.001.0001

Corman, V. M., Landt, O., Kaiser, M., Molenkamp, R., Meijer, A., et al., (2020). Detection of 2019 novel coronavirus (2019-nCoV) by real-time RT-PCR. *Eurosurveillance, 25*(3), Article 2000045. https://doi.org/10.2807/1560-7917.ES.2020.25.3.2000045

Dagan, N., Barda, N., Kepten, E., Miron, O., Perchik, S., et al., (2021). BNT162b2 mRNA Covid-19 vaccine in a nationwide mass vaccination setting. *New England Journal of Medicine, 384*, 1412-1423. https://doi.org/10.1056/NEJMoa2101765

Dehning, J., Spitzner, F. P., Linden, M., Mohr, S. B., Neto, J. P., et al., (2020). Model-based and model-free characterization of epidemic outbreaks - Technical notes on Dehning et al. *Science*, 2020. https://doi.org/10.1101/2020.09.16.20187484

Dehning, J., Zierenberg, J., Spitzner, F. P., Wibral, M., Neto, J. P., et al., (2020). Inferring change points in the spread of COVID-19 reveals the effectiveness of interventions. *Science, 369*(6500), Article eabb9789. https://doi.org/10.1126/science.abb9789

Desmet, M. (2022). *The psychology of totalitarianism*. Chelso Green.

Dowell, A. C., Butler, M. S., Jinks, E., Tut, G., Lancaster, T., et al., (2022). Children develop robust and sustained cross-reactive spike-specific immune responses to SARS-CoV-2 infection. *Nature Immunology, 23*(1), 40-49. https://doi.org/10.1038/s41590-021-01089-8

El Dib, R. P., Atallah, A. N., & Andriolo, R. B. (2007). Mapping the Cochrane evidence for decision making in health care. *Journal of Evaluation in Clinical Prac-*

tice, 13, 689-692. https://doi.org/10.1111/j.1365-2753.2007.00886.x

Elisha, E., Guetzkow, J., Shir-Raz, Y., & Ronel, N. (2022). Retraction of scientific papers: The case of vaccine research. *Critical Public Health, 32*(4), 533-542. https://doi.org/10.1080/09581596.2021.1878109

Emani, V. R., Pallipuram, V. K., Goswami, K. K., Maddula, K. R., Reddy, R., et al., (2022). Increasing SARS-CoV2 cases, hospitalizations, and deaths among the vaccinated elderly populations during the Omicron (B.1.1.529) variant surge in UK. *medRxiv,* Article 2022.2006.2028.22276926. https://doi.org/10.1101/2022.06.28.22276926

Everts, J. (2020). The dashboard pandemic. *Dialogues in Human Geography, 10*(2), 260-264. https://doi.org/10.1177/2043820620935355

Ferguson, N., Laydon, D., Nedjati Gilani, G., Imai, N., Ainslie, K., et al., (2020). Impact of non-pharmaceutical interventions (NPIs) to reduce COVID-19 mortality and healthcare demand. *M. C. f. G. I. D. A. R. 9*. https://www.imperial.ac.uk/mrc-global-infectious-disease-analysis/news--wuhan-coronavirus/

Fleck, L. (1979). *Genesis and development of a scientific fact*. Ed. by T.J. Trenn and R.K. Merton. University of Chicago Press.

Fraiman, J., Erviti, J., Jones, M., Greenland, S., Whelan, P., Kaplan, R. M., & Doshi, P. (2022). Serious adverse events of special interest following mRNA COVID-19 vaccination in randomized trials in adults. *Vaccine, 40*(40), 5798-5805. https://doi.org/10.1016/j.vaccine.2022.08.036

Franco-Paredes, C. (2022). Transmissibility of SARS-CoV-2 among fully vaccinated individuals. *The Lancet Infectious Diseases, 22*(1), 16. https://doi.org/10.1016/S1473-3099(21)00768-4

Gabbay, J., & le May, A. (2004). Evidence based guidelines or collectively constructed "mindlines"? Ethnographic study of knowledge management in primary care. *British Medical Journal, 329*, 1013-1017. https://doi.org/10.1136/bmj.329.7473.1013

Gill, J., Haslam, A., Crain, T., Herrera-Perez, D., & Prasad, V. (2020). Comparison of industry payments in 2017 with annual salary in a cohort of academic oncologists. *JAMA Internal Medicine*, *180*(5), 797-799. https://doi.org/10.1001/jamainternmed.2020.0090

Gorbalenya, A. E., Baker, S. C., Baric, R. S., de Groot, R. J., Drosten, C., et al., (2020). The species Severe acute respiratory syndrome-related coronavirus: Classifying 2019-nCoV and naming it SARS-CoV-2. *Nature Microbiology, 5*(4), 536-544. https://doi.org/10.1038/s41564-020-0695-z

Gøtzsche, P. C. (2013). *Deadly medicines and organised crime: How big pharma has corrupted health care*. Radcliffe.

Gøtzsche, P. C. (2015). *Deadly psychiatry and organised denial*. People's Press.

Gøtzsche, P. C. (2019). *Death of a whistleblower and Cochrane's moral collapse*. People's Press.

Greenhalgh, T., & Worrall, J. G. (1997). From EBM to CSM: The evolution of context-sensitive medicine. *Journal of Evaluation in Clinical Practice, 3*(2), 105-108. https://doi.org/10.1046/j.1365-2753.1997.00096.x

Harari, Y. N. (2017). *Homo Deus: A brief history of tomorrow*. Vintage. https://doi.org/10.17104/9783406704024

Hazell, L., & Shakri, S. A. W. (2006). Under-reporting of adverse drug reactions: A systematic review. *Drug Safety, 29*(5), 385-396. https://doi.org/10.2165/00002018-200629050-00003

Horton, R. (2015). Offline: What is medicine's 5 sigma? *The Lancet, 385*(9976), 1380. https://doi.org/10.1016/S0140-6736(15)60696-1

Howick, J., Koletsi, D., Ioannidis, J. P. A., Madigan, C., Pandis, N., et al., (2022). Most healthcare interventions tested in Cochrane Reviews not effective according to high quality evidence: A systematic review and meta-analysis. *Journal of Clinical Epidemiology, 148*, 160-169. https://doi.org/10.1016/j.jclinepi.2022.04.017

Howick, J., Koletsi, D., Pandis, N., Fleming, P. S., Loef, M., et al., (2020). The quality of evidence for medical interventions does not improve or worsen: A metaepidemiological study of Cochrane reviews. *Journal of Clinical Epidemiology, 126*, 154-159. https://doi.org/10.1016/j.jclinepi.2020.08.005

Hua, J., & Shaw, R. (2020). Corona virus (COVID-19) "infodemic" and emerging issues through a data lens: The case of China. *International Journal of Environmental Research and Public Health, 17*(7), Article 2309. https://www.mdpi.com/1660-4601/17/7/2309

Ioannidis, J. P. A. (2005). Why most published research findings are false. *PLoS Medicine, 2*(8), Article e124. https://doi.org/10.1371/journal.pmed.0020124

Ioannidis, J. P. A. (2018). Cochrane crisis: Secrecy, intolerance, and evidence-based values. *European Journal of Clinical Investigation, 49*(3), Article e13058. https://doi.org/10.1111/eci.13058

Jefferson, T., Del Mar, C., Dooley, E., Ferroni, E., Al-Ansari, L. A., et al., (2020). Physical interventions to interrupt or reduce the spread of respiratory viruses. *Cochrane Database of Systematic Reviews, CD006207. pub5*. https://doi.org/10.1002/14651858.CD006207.pub5

Keil, U., Schönhöfer, P., & Spelsberg, A. (2011). The invention of the swine-flu pandemic. *European Journal of Epidemiology, 26*(3), 187-190. https://doi.org/10.1007/

s10654-011-9573-6

Kisielinski, K., Giboni, P., Prescher, A., Klosterhalfen, B., Graessel, D., et al., (2021). Is a mask that covers the mouth and nose free from undesirable side effects in everyday use and free of potential hazards? *International Journal of Environmental Research and Public Health, 18*(8), Article 4344. https://doi.org/10.3390/ijerph18084344

Klement, R. J. (2020a). The SARS-CoV-2 crisis: A crisis of reductionism? *Public Health, 185*, 70-71. https://doi.org/10.1016/j.puhe.2020.06.019

Klement, R. J. (2020b). The SARS-CoV-2 crisis: Has medicine finally entered a reductionist era? *Complementary Medicine Research, 27*(4), 207-208. https://doi.org/10.1159/000510453

Klement, R. J. (2020c). Systems thinking about SARS-CoV-2. *Frontiers in Public Health, 8*, Article 585229. https://doi.org/10.3389/fpubh.2020.585229

Klement, R. J., & Bandyopadhyay, P. S. (2019). Emergence and evidence: A close look at Bunge's philosophy of medicine. *Philosophies, 4*(3), Article 50. https://doi.org/10.3390/philosophies4030050

Klement, R. J., & Bandyopadhyay, P. S. (2020). The epistemology of a positive SARS-CoV-2 test. *Acta Biotheoretica*, 69, 359-375. https://doi.org/10.1007/s10441-020-09393-w

Klement, R. J., & Walach, H. (2023). SEIR models in the light of critical realism - A critique of exaggerated claims about the effectiveness of Covid 19 vaccinations. *Futures, 148,* Article 103119. https://doi.org/10.1016/j.futures.2023.103119

Kowarz, E., Krutzke, L., Reis, J., Bracharz, S., Kochanek, S., & Marschalek, R. (2021). "Vaccine-induced Covid-19 mimicry" syndrome: Splice reactions within the SARS-CoV-2 Spike open reading frame result in Spike protein variants that may cause thromboembolic events in patients immunized with vector-based vaccines. *Research Square*. https://doi.org/10.21203/rs.3.rs-558954/v1

Krüger, U. (2013). *Meinungsmacht: Der Einfluss von Eliten auf Leitmedien und Alpha-Journalisten. Eine kritische Netzwerkanalyse*. von Halem.

Krutzke, L., Roesler, R., Wiese, S., & Kochanek, S. (2021). Process-related impurities in the ChAdOx1 nCov-19 vaccine. *Nature Portfolio*. https://doi.org/10.21203/rs.3.rs-477964/v1

Kuhbandner, C., Homburg, S., Walach, H., & Hockertz, S. (2020a). Comment on Dehning et al (Science, 15 May 2020, eabb9789: Inferring change points in the spread of COVID-19 reveals the effectiveness of interventions). *Advance Social Sciences and Humanities Preprint, Preprint*. https://doi.org/10.31124/advance.12362645.v1

Kuhbandner, C., Homburg, S., Walach, H., & Hockertz, S. (2020b). Was Germany's corona lockdown necessary? *Advance - Sage Preprint*. https://doi.org/10.31124/advance.12362645.v3

Kuhbandner, C., Homburg, S., Walach, H., & Hockertz, S. (2022). Was Germany's lockdown in spring 2020 necessary? How bad data quality can turn a simulation into a dissimulation that shapes the future. *Futures, 135*, Article 102879. https://doi.org/10.1016/j.futures.2021.102879

Loughlin, M., Lewith, G., & Falkenberg, T. (2013). Science, practice and mythology: A definition and examination of the implications of scientism in medicine. *Health Care Analysis, 21*, 130-145. https://doi.org/10.1007/s10728-012-0211-6

Lyons-Weiler, J. (2021). If vaccine adverse events tracking systems do not support causal inference, then "pharmacovigilance" does not exist. *Science, Public Health Policy, and the Law, 3*, 81-86. https://cf5e727d-d02d-4d71-89ff-9fe2d3ad957f.filesusr.com/ugd/adf864_4588b37931024c5d98e35a84acf8069a.pdf

Makary, M. A., & Daniel, M. (2016). Medical error—the third leading cause of death in the US. *The BMJ, 353*, Article i2139. https://doi.org/10.1136/bmj.i2139

Meyer-Abich, K. M. (2010). *Was es bedeutet, gesund zu sein. Philosophie der Medizin*. Hanser.

Miles, A., & Asbridge, J. (2014). Clarifying the concepts, epistemology and lexicon of person-centeredness: An essential pre-requisite for the effective operationalization of PCH within modern healthcare systems (Editorial). *European Journal of Person Centered Healthcare, 2*(1), 1-15. https://doi.org/10.5750/ejpch.v2i1.857

Milgrom, L. (2021). Against scientism: Corrupted science and the fight for medicine's soul. *Complementary Medicine Research, 28*(1), 56-63.

Moore, T. J., & Bennett, C. L. (2012). Underreporting of hemorrhagic and thrombotic complications of pharmaceuticals to the U.S. Food and Drug Administration: Empirical findings for Warfarin, Clopidogrel, Ticlopidine, and Thalidomide from the Southern Network on Adverse Reactions (SONAR). *Seminars in Thrombosis Hemostasis, 38*(08), 905-907.

Mörl, F., Günther, M., & Rockenfeller, R. (2022). Is the harm-to-benefit ratio a key criterion in vaccine approval? [Opinion]. *Frontiers in Medicine, 9*, Article 879120. https://doi.org/10.3389/fmed.2022.879120

Nordström, P., Ballin, M., & Nordström, A. (2021). Risk of infection, hospitalisation, and death up to 9 months after a second dose of COVID-19 vaccine: A retrospective, total population cohort study in Sweden. *Lan-*

cet, 399(10327), 814-823. https://doi.org/10.1016/S0140-6736(22)00089-7

O'Driscoll, M., Ribeiro Dos Santos, G., Wang, L., Cummings, D. A. T., Azman, A. S., et al., (2021). Age-specific mortality and immunity patterns of SARS-CoV-2. *Nature, 590*(7844), 140-145. https://doi.org/10.1038/s41586-020-2918-0

Olliaro, P., Torreele, E., & Vaillant, M. (2021). COVID-19 vaccine efficacy and effectiveness - The elephant (not) in the room. *The Lancet Microbe, 2*(7), e279-e280. https://doi.org/10.1016/S2666-5247(21)00069-0

Pinker, S. (2018). *Enlightenment now: The case for reason, science, humanism, and progress*. Penguin.

Polack, F. P., Thomas, S. J., Kitchin, N., Absalon, J., Gurtman, A., et al., (2020). Safety and efficacy of the BNT162b2 mRNA Covid-19 vaccine. *New England Journal of Medicine, 383*(27), 2603-2615. https://doi.org/10.1056/NEJMoa2034577

Ren, L. L., Wang, Y. M., Wu, Z. Q., Xiang, Z. C., Guo, L., et al., (2020). Identification of a novel coronavirus causing severe pneumonia in human: A descriptive study. *Chinese Medical Journal (Engl), 133*(9), 1015-1024. https://doi.org/10.1097/cm9.0000000000000722

Ridings, J. E. (2013). The thalidomide disaster, lessons from the past. In B. P. Barrow (Ed.), *Teratogenicity testing* (vol. 947, pp. 575-586). Humana Press. https://doi.org/10.1007/978-1-62703-131-8_36

Rose, J. (2021). A report on the U.S. vaccine adverse events reporting system (VAERS) on the Covid-19 messenger ribonucleic acid (mRNA) biologicals. *Science, Public Health Policy, and the Law, 2*, 59-80. https://www.publichealthpolicyjournal.com/_files/ugd/adf864_a0a813acbfdc4534a8cb50cf85193d49.pdf

Sahin, U., Karikó, K., & Türeci, Ö. (2014). mRNA-based therapeutics — Developing a new class of drugs. *Nature Reviews Drug Discovery, 13*(10), 759-780. https://doi.org/10.1038/nrd4278

Schwarz, S., Jenetzky, E., Krafft, H., Maurer, T., & Martin, D. (2021). Coronakinderstudien "Co-Ki": Erste Ergebnisse eines deutschlandweiten Registers zur Mund-Nasen-Bedeckung (Maske) bei Kindern [Corona children studies "Co-Ki": First results of a Germany-wide registry on mouth and nose covering (mask) in children]. *Monatsschrift Kinderheilkunde, 169*, 353-365. https://doi.org/10.1007/s00112-021-01133-9

Seneff, S., & Nigh, G. (2021). Worse than the disease? Reviewing some possible unintended consequences of the mRNA vaccines against COVID-19. *International Journal of Vaccine Theory, Practice, and Research, 2*(1), 38-79. https://doi.org/10.56098/ijvtpr.v2i1.23

Seneff, S., Nigh, G., Kyriakopoulos, A., & McCullough, P. (2022). Innate immune suppression by SARS-CoV-2 mRNA vaccinations: The role of G-quadruplexes, exosomes and microRNAs. *Food and Chemical Toxicology, 164*, Article 113008. https://doi.org/10.1016/j.fct.2022.113008

Shir-Raz, Y., Elisha, E., Martin, B., Ronel, N., & Guetzkow, J. (2022). Censorship and suppression of Covid-19 heterodoxy: Tactics and counter-tactics. *Minerva*, 1-27. https://doi.org/10.1007/s11024-022-09479-4

Sorgner, S. L. (2010). Beyond humanism: Reflections on trans- and posthumanism. *Journal of Evolution and Technology, 21*(2), 1-9. http://jetpress.org/v21/sorgner.htm

Stachowske, R. (2014). Kindesmisshandlungen vor und nach der Schwangerschaft: "Contergan-Katastrophe Nr. 2". *Trauma - Zeitschrift für Psychotraumatologie und ihre Anwendungen, 12*(3), 4-11.

Sturmberg, J. P., & Martin, C. M. (2021). How to cope with uncertainty? Start by looking for patterns and emergent knowledge. *Journal of Evaluation in Clinical Practice, online first*. https://doi.org/10.1111/jep.13596

Thomas, S. J., Moreira, E. D., Kitchin, N., Absalon, J., Gurtman, A., et al., (2021). Six month safety and efficacy of the BNT162b2 mRNA COVID-19 vaccine. *medRxiv,* Article 2021.2007.2028.21261159. https://doi.org/10.1101/2021.07.28.21261159

Tseng, C.-T., Sbrana, E., Iwata-Yoshikawa, N., Newman, P. C., Garron, T., et al., (2012). Immunization with SARS coronavirus vaccines leads to pulmonary immunopathology on challenge with the SARS virus. *PLoS One, 7*(4), Article e35421. https://doi.org/10.1371/journal.pone.0035421

Uexküll, T. v. (1995). Biosemiotic research and not further molecular analysis is necessary to describe pathways between cells, personalities, and social systems. *Advances, 11*, 24-27.

Uexküll, T. v., & Wesiack, W. (1988). *Theorie der Humanmedizin. Grundlagen ärztlichen Denkens und Handelns* [Theory of medicine. Foundations of medical thinking and action]. Urban & Schwarzenberg.

van Fraassen, B. (2016). Naturalism in epistemology. In R. N. Williams & D. N. Robinson (Eds.), *Scientism: The new orthodoxy* (pp. 64-95). Bloomsbury.

Walach, H., & Hockertz, S. (2020a). A reply to Dr. Pan's and Dr. Wu's response: "Wuhan COVID-19 data – An example to show the importance of public health interventions to fight against the pandemic". *Toxicology, 441*, Article 152524. https://doi.org/10.1016/j.tox.2020.152524

Walach, H., & Hockertz, S. (2020b). Wuhan Covid19 data – More questions than answers. *Toxicology, 440*, Article 152486. https://doi.org/10.1016/j.tox.2020.152486

Walach, H., Klement, R. J., & Aukema, W. (2021a). Retract-

ed: The safety of COVID-19 vaccinations—We should rethink the policy. *Vaccines, 9*(7), Article 693. https://doi.org/10.3390/vaccines9070693

Walach, H., Klement, R. J., & Aukema, W. (2021b). The safety of COVID-19 vaccinations — Should we rethink the policy? *Science, Public Health Policy, and the Law, 3*, 87-99. https://doi.org/10.3390/vaccines9070693

Walach, H., Klement, R. J., & Aukema, W. (2022). The risk-benefit ratio of Covid-19 vaccines: Publication policy by retraction does nothing to improve it. *Clinical and Translational Discovery, 2*(1), Article e35. https://doi.org/10.1002/ctd2.35

Walach, H., Ofner, M., Ruof, V., Herbig, M., & Klement, R. J. (2022). Why do people consent to receiving SARS-CoV2 vaccinations? A representative survey in Germany. *BMJ Open, 12*(8), Article e060555. https://doi.org/10.1136/bmjopen-2021-060555

Walach, H., Ruof, V., & Hellweg, R. (2021). Opinion of German immunologists' on SARS-CoV2: Results of an online survey. *Cureus, 13*(11), Article e*19393*. https://doi.org/10.7759/cureus.19393

Walach, H., Traindl, H., Prentice, J., Weikl, R., Diemer, A., Kappes, A., & Hockertz, S. (2022). Carbon dioxide rises beyond acceptable safety levels in children under nose and mouth covering: Results of an experimental measurement study in healthy children. *Environmental Research, 212*, Article 113564. https://doi.org/10.1016/j.envres.2022.113564

Walach, H., Weikl, R., Prentice, J., Diemer, A., Traindl, H., Kappes, A., & Hockertz, S. (2021). Retracted: Experimental assessment of carbon dioxide content in inhaled air with or without face masks in healthy children: A randomized clinical trial. *JAMA Pediatrics*. https://doi.org/10.1001/jamapediatrics.2021.2659

Watson, O. J., Barnsley, G., Toor, J., Hogan, A. B., Winskill, P., & Ghani, A. C. (2022). Global impact of the first year of COVID-19 vaccination: A mathematical modelling study. *Lancet Infectious Diseases*, *22*(9), 1293-1302. https://doi.org/10.1016/S1473-3099(22)00320-6

Wieland, W. (1975). *Diagnose. Überlegungen zur Medizintheorie*. de Gruyter. https://doi.org/10.1515/9783110845945

Wiley, N. M. (2022). Critique of the necropolitical economy of the Internet of Things: Brains, biohacking, and social apartheid. *International Journal of Computer Science and Engineering Survey, 13*(3), 1-12. https://doi.org/10.5121/ijcses.2022.13301

Williams, R. N., & Robinson, D. N. (Eds.). (2016). *Scientism: The new orthodoxy*. Bloomsbury.

Wolf, N. (2022). *The body of others: The new authoritarians, COVID-19 and the war against the human*. All Seasons Press.

World Health Organization. (2020). WHO Director-General's opening remarks at the media briefing on COVID-19 11 March 2020.

Zhu, N., Zhang, D., Wang, W., Li, X., Yang, B., et al., (2020). A novel coronavirus from patients with pneumonia in China, 2019. *New England Journal of Medicine, 382*(8), 727-733. https://doi.org/10.1056/NEJMoa2001017