Three Markers of Pseudoscience in Commentary about the Dangerousness of COVID-19

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ABSTRACT

This paper enumerates several false assumptions about science that appeared during the COVID-19 pandemic in commentary by scientific authorities, government officials, and mainstream media about the dangerousness of COVID-19. The paper seeks to help readers to avoid being deceived in the manner that so many were deceived during the pandemic. To that end, the paper offers three markers of pseudoscience that were prominent in much of the deceptive commentary about the dangerousness of COVID-19. Because these markers can appear in virtually any commentary about science, their scope of application is very broad. In common with most of the material it critiques, this paper is a work of commentary rather than a scientific study. It proceeds from a basic philosophy of science perspective, reflecting the author's background as a philosopher and a practicing physician with specialization in mass casualty medicine.[1,2,3,4,5,6]

Introduction

During the COVID-19 pandemic leading medical professionals, politicians, and mainstream news media were complicit in deceiving the public about fundamentally important scientific matters. With respect to what was perhaps the public's most pressing question at the time – "If I get infected with COVID-19, how likely is it that I will die?" – wildly inaccurate information was disseminated by reputable news outlets, endorsed by prominent physicians, and used by policy-makers to justify coercive public health measures such as lockdowns.[2,7] At the same time, anyone who objected to the disinformation was attacked as an enemy of science.[8-9]

The irony of scientists invoking invalid, pseudoscientific arguments to suppress legitimate scientific discourse is illustrated in an op-ed piece published by *The Washington Post* on April 28, 2020, which warns people not to accept the results from recent studies that bring to light what should have been obvious without any study at all – that COVID-19 mortality rates were being greatly exaggerated and in reality were much lower than widely reported. The article states:

> Two recent studies from California, using antibody tests designed to look for immune markers of previous infections, seem to suggest that the virus is much less deadly than many previously thought. But beware of these findings: They have not been vetted and should be recognized as such.[10]

What the authors somehow neglect to mention in this article is that the fatality rate they seem to endorse as the best current estimate, which they describe as what "many people previously thought" prior to the California studies, was not itself "vetted" in the manner the authors demand, and was based on a major epidemiological confusion known to produce greatly exaggerated estimates of fatality rates (namely the belief that a confirmed case viral mortality rate is a suitable surrogate marker for the overall viral mortality rate).

Methodological limitations of the California studies are correctly explained by Daly and the other *Washington Post* authors, highlighting, for instance, the high false-positive rate in the test used to diagnose COVID-19 infection and the possibility of selection bias in a sample population acquired on Facebook. But they omit another obvious and far more significant limitation. Namely, the selection bias manifested in what "many people thought" to be the best estimate — created by wrongly assuming that the infection fatality rate will mirror the confirmed case fatality rate—is massive, and totally invalidates the estimate. A selection method that includes only people with infections severe enough to be confirmed through testing will select out infections that are more severe than a selection method (such as the one they criticize) that includes people without symptoms sufficient to be noticed or to evoke testing.[2]

The *Washington Post* piece finishes with seemingly sensible advice: "Making decisions that involve human lives should be based on science, verified and vetted. In our understandable desire to return to normalcy today, we can ill afford to sacrifice our health and well-being tomorrow." But this advice cuts in precisely the opposite direction than where the authors pretend it does. It favors the California studies, which actually employed plausible scientific methodology and exhibited it in their reports, rather than the non-scientific, invalid reasoning behind what "many previously thought" about mortality in cases of COVID-19 infection.

It is unclear just how the misinformation prevailing during the COVID-19 epidemic came to dominate academic, government, and mainstream media sources while never being effectively challenged. Multiple factors present themselves as possibilities, including the demise of objective journalism, the politicization of practically everything, efforts to discredit or even eliminate dissenting voices, and the proliferation among scientists, news media, and policy makers of motives contrary to the pursuit of scientific truth. I will not speculate about

such matters in this essay. Instead, I ask how in the future we might avoid being deceived in the manner that so many were deceived during the pandemic. To that end I present three markers of pseudoscience that appeared in commentary about the dangerousness of COVID-19. Attentiveness to these markers should help in distinguishing genuine science from efforts to appropriate science for political propaganda or other non-scientific ends.

First Marker of Pseudoscience: Science is Invoked as the Basis for a Moral Judgment

The first marker of pseudoscience is the most straightforward. Any time an opinion about what *should* be done is claimed to be a conclusion of science, the claim is false. Science investigates matters of fact and never tells us what we should do.[2] As Albert Einstein observed: "For the scientist, there is only 'being,' but no wishing, no valuing, no good, no evil; no goal."[11]

Betraying their ignorance of this basic feature of science, politicians and regulators during the COVID-19 epidemic regularly described their policies as "following the science."[12-13] Such claims are not merely misleading; they are straightforwardly false. Science doesn't make policy judgments. Science does provide facts that are sometimes relevant to such judgments. But the judgments always also hinge on moral-political values and on how these values are weighed and prioritized, one against the other – factors about which science is silent. Persons who value freedom above all else, for instance, will process scientific information differently than those who prioritize safety. To present a single alternative as the only genuinely "scientific" approach ignores this reality and perpetuates a lie.

Opinions about the nature of moral-political rightness and wrongness, that is, about what people "ought" to do, occupy the realms of moral theology, theoretical ethics and political philosophy. These fields of study generate virtually no agreement among serious inquirers, and only ephemeral agreements among those who have abandoned inquiry and moved into advocacy.[14-15] Moral-political advocacy employs opinions adopted on the basis of fashion, emotion, convictions about the betterment of the world, political power, or any of a million other motives that have little or nothing to do with actually discerning the truth of a moral-political outlook.

There are of course commentators who question the notion that science pursues facts, or that objective facts can even be distinguished from subjective opinions. It is currently fashionable in some circles, for instance, to state that all knowledge claims, including alleged statements of scientific fact, are human constructs unconnected to any external reality or objective truth and created solely for purposes such as securing political or cultural power. This claim typically is advanced, in a confused manner, as an inference from Derrida's or Foucault's deconstructionism.[16] It is itself often treated as an objective truth and in those instances it is straightforwardly self-refuting.

The less obviously self-refuting way to advance the radical deconstructionist claim is to concede that it is itself also a human construct without objective character, and epistemically no more valid than the completing knowledge claims it seeks to discredit – but then to assert it anyway. This approach eliminates the obvious self-contradiction at the expense of also negating any compelling reason to affirm this version of deconstruction. If the deconstructionist thesis is no more and no less objectively "true" or "morally correct" than any other claim, then it offers only an arbitrary abandonment of common sense. As George Santayana observed, even the behavior of common animals exhibits, as a matter of apparent "animal faith," confidence that there is an outside world that exhibits real opportunities and real threats, and that needs to reckoned with.[17] When a deconstructionist crosses a busy city street the same belief is in evidence.

The germ of truth in this version of deconstructionism is that every attempt by any subjective consciousness to articulate an objective truth will be tainted to some extent by the subject's subjectivity. In that non-controversial sense, one could say that there are no pure fact statements – a truth that philosophers of science have recognized for over a century. All statements of fact and truth are tainted in this way, and the taint can never be fully extricated. We can at best only approach objective truth. We approach objectivity by practices such as distinguishing "is" statements from "ought" statements and "facts" from "values." Science deals with what "is" and with matters of "fact" – whereas what "ought" to be done and which "values" human beings ought to embrace is assigned to non-scientific forms of inquiry.[1(pp 56-64)]

Second Marker of Pseudoscience: Opinion Poses as Science

When a scientific question arises – for instance, the question "How dangerous is the COVID-19 virus?" – science responds by conducting empirical studies that address the question as directly as possible while controlling as much as possible for factors that could corrupt the results. What science does not do is settle the matter by contacting Gallop or Pew and asking them to conduct a poll about scientists' thoughts on the matter. And what it certainly does not do is ask journalists to interview a few favored scientists and then report the journalists' sense of what these scientists collectively believe. Yet, bizarrely, the practice of reporting scientists' opinions has proliferated as a basis for determining the conclusions of science.

Indeed, this practice seems to be precisely what Daly and associates recommend in the previously-discussed *Washington Post* article.[10] They provide no argument for their opinion about the deadliness of the virus. Instead, they seem merely to presume that since their opinion represents the consensus among high-profile scientists commenting on the matter in mainstream news media, it should be regarded as the current best scientific estimate.

Current opinions of scientists, even when they enjoy strong consensus, should not be conflated with conclusions of science. Scientists' opinions constitute conclusions of science only in rare instances where: (1) science has actually reached a "conclusion" – meaning scientific inquiry has effectively ceased because scientific evidence leads inexorably towards the affirmation of a single hypothesis; and (2) the opinions of scientists coalesce on that single hypothesis, based on their proper interpretation of available evidence.

Far more common are instances where available scientific evidence does not point to a single clear conclusion, but rather is open to diverging interpretations that invite various diverging hypotheses and the accumulation of more evidence. The mere fact that science is studying a matter suggests that the matter is not settled scientifically, and needs study. Any attempt to pass an opinion about such a matter as a fact, as if it was settled, is a deception.

The key, then, to imparting scientific information honestly to the public is to imbed it as much as possible in the processes of science. With respect to information about the dangerousness of COVID-19, honest communication would, at a minimum, involve the following: (1) emphasizing the tentativeness of early estimates; (2) explaining the dynamic nature of the COVID-19 virus, especially how as an RNA virus it is given to rapid mutation that alters its epidemiological characteristics; (3) employing the best available measures of disease impact, such as the loss of disability-adjusted-life years (DALY) or quality-adjusted-life-years (QALY), and avoiding more misleading parameters, such as mortality rates; and (4) when mortality rates need to be employed due to the lack of better alternatives, explaining how the concept of a mortality rate, and its derivation, limit its usefulness as a measure of disease impact.

One of the dominant features of public rhetoric about COVID-19 was its cocksureness. Rather than emphasizing the tentativeness of early theories about the behavior of the virus, or admitting the

lack of evidence about the overall effectiveness of interventions such as lockdowns, public officials and high-profile healthcare professionals tended to present their recommendations as grounded on rock-solid science, while denigrating or cancelling anyone who disagreed with them. Even recommendations that were backed by reliable evidence of clinical effectiveness (such as recommendations to obtain a COVID-19 immunizations) were often couched in deception. U.S. President Biden, for instance, campaigned with repeated assurances that he would "beat" the virus,[18] suggesting that the virus could be eliminated or rendered dormant through vaccination. Likewise an article by Vox compared the success of smallpox vaccinations in eradicating smallpox to what we might achieve with the COVID-19 vaccines.[19] Though the Vox article mentions a few challenges that could impede efforts to eliminate COVID-19 through vaccination, it perpetuates the eradication facade by omitting a fundamental fact: RNA viruses such as COVID-19 tend to mutate rapidly and will continually produce vaccine-resistance in a manner that is not seen with the much larger DNA viruses such as smallpox and polio. Immunizations for COVID-19 therefore will need to be continually retooled to address a proliferation of diverging strains. That this reality was not widely reported by mainstream news media — and that so many of them seemed surprised when the inevitable vaccine resistance emerged — suggests either extreme incompetence or deliberate deception on the part of the news media.

Instead of lamenting the ignorance or stupidity of immunization "deniers," commentators would do better to consider how their own constant exaggerations, deceptions and lies might have generated distrust, creating fertile ground for otherwise irrational denials. Public trust is fragile, especially in this age of political contention. To earn it, politicians and scientists need to cultivate honesty rather than merely trying to gloss over their deceptions.

Trust is eroded when scientists appeal to their own authority rather than to scientific evidence. Such appeals imply that the public should accept certain opinions as fact because they are uttered by eminent scientists, a distortion that will not go unnoticed by perceptive critics. Appeals to personal authority are particularly vulnerable when they come from scientists who lack specific expertise in the subject of discussion – evidently believing that their eminence is so potent that it endows them with great insight even on matters they have not closely studied.

Especially in commentary on emerging problems that have not been extensively researched, like the behavior of a novel virus, appeals to authority or to a consensus of like-minded scientific authorities are almost always misleading, since no basis for confidence about the features of new and novel phenomena is likely to exist. False confidence and premature fact-claims are part of the reason why public trust in scientists and scientific organizations (often wrongly conflated with trust in legitimate science) is diminished in the aftermath of COVID-19. Mistrust exists not because the public regards scientific inquiry as impotent. The public still reveres genuine science. Mistrust exists because many in the public think that scientists, or at least some scientists, are spreading political propaganda rather than imparting scientific knowledge.[20]

Indeed, the public's suspicions are correct. Consider, for instance, the increasing incidence among elite scientific journals of overt appeals to moral-political opinion.

In 2020, the editors of the *Wall Street Journal* reported on how *Nature Communications* retracted an article on the basis of disapproval from gender diversity advocates about its results.[21] Subsequently, the *Journal* reports, *Nature Communications* updated its editorial policy to seek input on "broader societal implications of publishing a paper," urging that "the review process takes into account the dimension of

potential harm" pertaining if a paper is published – as if "broader societal implications" and "the dimension of potential harm" are things that can be objectively assessed by peer reviewers, and as if what counts as a "harm" is not subject to political bias. Similar formal editorial appeals to reviewers' moral-political opinions have proliferated since then.

It is difficult to imagine a more arrogant overstepping of one's boundaries. Not content with merely contributing to the accumulation of scientific knowledge, *Nature Communications* and similar "elite" scientific journals have anointed themselves as moral authorities and censors, and have undertaken the moral edification of the masses. Any opinion that has been vetted through such a biased peer review is not "scientific" in any legitimate sense. To market it as such is to deceive the public.

Third Marker of Pseudoscience: Bureaucratic Procedure Poses as Science

In relating the dangerousness of COVID-19, journalists relied almost exclusively on mortality rates, which is not surprising given that the concept of a mortality rate is both easy to grasp and widely used by government health bureaucracies. More surprising is that health scientists also conceived and reported the matter nearly exclusively in terms of mortality rates, since there are better and more accurate ways of measuring the impact of a disease, such as loss of disability-adjusted life-years (DALY), loss of quality-adjusted life-years (QALY), or simply in terms of the cumulative years of life lost. Mortality rates treat all deaths as equally significant, regardless of the age or condition of the decedent. DALY and QALY were designed to remedy this distortion. The World Health Organization, for instance, has employed DALYs in its periodic estimates of the worldwide burden of disease.

Because mortality rates are easier to estimate in the initial stages of a novel health threat, scientists can be forgiven for their early emphasis on them. What is unforgivable is that scientists did not rise up in unison to point out the fallacy of using confirmed case mortality rates as a proxy for overall infection mortality rates (a fallacy committed by virtually all news media and also by many ostensibly scientific publications). The public was never informed that confirmed case mortality rates are not used to estimate or report viral mortality from diseases such as influenza, because the vast majority of infections are never confirmed and the ones that are confirmed tend to be a small subset of the most serious infections, causing confirmed case mortality rates to be vastly higher than actual infection mortality rates.

This point would have been easy enough to demonstrate, at least in June of 2020, when data needed to calculate a confirmed case mortality rate for influenza was available to the public on the CDC website (I accessed it in Spring of 2020 but was unable to do so a few months later). As it turns out, the confirmed case mortality rate for influenza was at that point higher (8%) than it was for COVID-19 (6%).[2] Not that the comparison is significant – confirmed case mortality rates are scientifically meaningless (which is my point) and COVID-19 certainly was a considerably more dangerous infection than influenza for most demographic groups (excluding children and adolescents).

That news media actually compared, on a recurring basis, the confirmed case mortality rate for COVID-19 to scientific estimates of the actual infection mortality rates for influenza and on this basis trumpeted the assertion that COVID-19 was "60 times more fatal than the seasonal flu" (Editors of the *Seattle Times*, 2020) is arguably one of the biggest lies in the history of journalism. And it went virtually unchallenged.

Now that normalcy has more or less returned, the worldwide news media, never widely brought to task for their failures during the peak of the pandemic, now routinely peddle statements such as the claim that "one million Americans died from COVID-19 over the course of the pandemic" as if they were uncontroversial, established statements of fact.

These phenomena derive from, and illustrate, another prime marker of pseudoscience: bureaucratic convention posing as science. Mortality reports employ actuarial assumptions that greatly simplify and seriously misrepresent the process of human dying. Though they bear great importance for various bureaucracies seeking taxpayer or donor funding, they have limited scientific utility. Such is the case even when dying has not been politicized as it was during the pandemic.

Inaccurate bureaucratic assumptions pertaining to mortality rates include the following: (1) the assumption that no one ever dies of old age; (2) the assumption that disease-specific mortality rates can be accurately measured; and (3) the assumption that everybody dies from a single primary cause. None of these assumptions is supported by science.

Early in my career in medicine, as an intern in internal medicine, I had my first run-in with America's health bureaucracy. A lady visited my hospital because she was feeling run down, then promptly died. She was over a hundred years old. She had no known medical conditions and apparently no medical records. And her immediate cause of death was not known. I was tasked with filling out her death certificate. Under cause of death I made the only scientifically defensible judgment: "Unknown." Shortly thereafter the form bounced back along with a terse note from some bureaucrat that I had to enter a specific primary cause of death. I note that at this point we entered into a nether world of bureaucratic fiction, abandoning science. I wrote in what I figured was the least egregious falsehood: "Old age." Again the form bounced back, and the note said that it was impossible to die of old age. There had to be a specific cause. So I wrote something suitably vague, given the absence of knowledge about why the lady actually died: "Cardiac Arrest." Again my proposed cause of death was rejected. This time the irritated bureaucrat called me on the phone and explained that I needed to identify a specific, government-approved pathology or injury as the primary cause of death, and that some generic end-stage state like cardiac arrest did not qualify. I needed to be specific. "But we don't know why she died," I said. The bureaucrat replied that if necessary I needed to make something up. So I wrote in the lie that was most fashionable at the time: "Myocardial Infarction." Henceforth the old lady became an official statistic cited in studies claiming there was a major problem with older women failing to receive needed coronary disease workups and management. The world of organized medicine began to pretend that if this lady had received a timely cardiac catheterization, she might be alive today. I suspect that, in reality, *not* receiving a catheterization or other intrusive medical evaluations was part of the reason why this lady lived so long.

One assumption working in this morass of bureaucratic pretense is the claim that, if only medicine succeeded in its task of eradicating disease and protecting people from motor vehicles, guns, and other sources of injury, we would all be immortal. This is perhaps the ultimate fiction driving not only medical bureaucracies, but also much of medicine itself. It involves a rejection of the naturalist understanding of death – as something programmed, biologically useful, and inherent to life – in favor of a technocratic understanding of death as a horrible mishap and a problem to be overcome.

Even if we granted this bizarre worldview, mortality rates would be a blunt instrument at best, since medical science cannot reliably identify causes of death and, as per my experience with the death certificate, recorded causes of death are frequently just guesses. Furthermore, deaths tend to be multifactorial. Cause-of-death determinations are often arbitrary – where multiple factors have combined to kill a patient, and one disease needs to be selected (for actuarial reasons) as the ultimate culprit. As the late Yale surgeon Sherwin Nuland has elegantly explained, the lack of a single identifiable primary cause of death is, in reality, the rule rather than the exception in deaths of elderly persons.[22(p 78)]

Because a majority of people dying while being thought to have a COVID-19 infection were elderly and chronically ill, most of the cases where COVID-19 was identified as a cause of death could have been identified as deaths from other causes. COVID-19 was apt to be chosen over other candidates because it was front-and-center in the public consciousness, there was immense pressure in the medical profession to underscore the seriousness of the COVID-19 pandemic, and published criteria for identifying COVID-19 as a primary cause of death were, in some cases, comically lax.

An example of the latter is the World Health Organization's "International Guidelines for Certification and Classification (Coding) for COVID-19 as Cause of Death," which states:

> A death due to COVID-19 is defined for surveillance purposes as a death resulting from a clinically compatible illness, in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID disease (e.g. trauma).[23]

If this guidance was universally followed, then almost every death occurring in the context of influenza or any other respiratory virus would have been attributed to COVID-19, even in the absence of serological testing. Though WHO guidelines for certifying COVID-19 as the cause of death were by no means universally adopted, mere suspicion of COVID-19 was from an actuarial perspective often taken as sufficient reason for attributing a death to COVID-19.

The truth of the matter is that there is no "correct" number of COVID-19 deaths because people do not typically die of one discrete primary cause. Even when a single factor strongly predominates in causing a person's demise, medicine often misses it. Much of the literature speculating that official COVID-19 mortality rates are too high or too low assumes that there is an identifiable correct rate. But such is not the case. It is a bureaucratic fiction.

Conclusion

Health emergencies such as pandemics present both scientific and political challenges. Though science and government need to work together in such emergencies, each should remain mindful of its independence from the other. Scientific judgments will need to be made on the basis of radically incomplete information. Political judgments will need to be made despite the interplay of radically diverse and incompatible moral perspectives. Honesty about these limitations, and flexibility in changing policies when new information becomes available or political clarification occurs, is preferable to lying and deception, even when it forces us to live with uncertainty.

Trust in public leadership, including scientific leadership, is diminished in the aftermath of the COVID-19 pandemic. From the standpoint of science, much of the diminished trust is related to politization, including the dissemination of radically inaccurate information about the dangerousness of the COVID-19 virus. Trust issues would improve if science quit taking sides on moral-political controversies and quit corrupting scientific inquiry with ideology. Scientists either will stick to science or they will become political agents distrusted and reviled by those with opposing political perspectives.

Until honesty and trust are restored, people hoping to sort out legitimate science from pseudoscience can begin by considering the three markers of pseudoscience I have described in this paper.

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