The Role of the Scientist

Lessons from Climate Change and COVID-19

By Cameron N. Ramey

On December 30th, 2019, Li Wenliang, an ophthalmologist at Wuhan Central Hospital, messaged his colleagues and warned them to take caution; he suspected that several new cases of a SARS-like virus could carry a high risk of infection. Within a week, police accused him of spreading rumors and disturbing "the social order". They then forced him to sign a written statement admitting to making false claims. He returned to the hospital to care for his patients and passed away a month later from the same illness. Dr. Wenliang "discovered" the coronavirus and did his best to inform us while fulfilling his duty to his patients.

In many ways, COVID-19 and climate change are similar. Both are emergencies with global consequences. By "flattening the curve", we are reducing high infection rates. In trying to mitigate the effects of climate change, we are also flattening a curve: the drastic growth in global temperatures once famously dubbed "the hockey stick".

What distinguishes them most is the timing of the emergency. COVID-19 has exploded into a globally recognized crisis in a matter of months. The effects are immediately visible- overburdened hospitals in New York, clear skies in L.A., and empty canals in Venice. And for the first time in 30 years, the Himalayas can be seen from busy city centers of northern India. Climate change on the other hand, has a slower burn. The effects grow increasingly severe over time. Climate change exacerbates the effects of deforestation, increases the severity of droughts and hurricanes, and widens socioeconomic disparities.

The role of Dr. Wenliang provides another, less obvious parallel. As a doctor, he was able to recognize the potential danger of coronavirus, and that observation was informed by science. Communicating this risk was absolutely critical to informing the rest of the public, although he faced opposition in doing so.

Dr. Wenliang's role in reporting the risk of COVID-19 presents an opportunity to look at the role that scientists play in communicating the risks of climate change, especially activities that look like advocacy. So what is the role of the scientist? Can we be both good scientists and good advocates? *Should* scientists be advocates? These are questions that I have been asked to consider as I prepare to tackle the world's wicked problems.

In his 2001 essay "What is, What Might Be, and What Ought to Be", Edward Rykiel claims that "When a scientist becomes an activist, the dangers are that scientific information will be distorted to support the proposed policy and that the public will be misled into believing that the policy is based on science rather than on the scientist's values".[i]

In my senior capstone class, we were asked to respond to Rykiel's essay and more generally: what is the role of the scientist? In a room full of aspiring scientists and science communicators, I was shocked to find that there was no consensus among us. Opinions ranged from: *as scientists we absolutely should not be advocates* – to – *as scientists, it is our responsibility to be advocates.* I immediately thought, how can we transition into our professional roles with no consensus on these questions?

I decided to seek out expert opinion; I set a goal to interview 5 scientists and determine their opinions on advocacy. It soon became apparent that advocacy means different things to different people, and that the question we should be asking is:

What is advocacy?

Advocacy, apparently takes many forms. Ask a paleo-climatologist, an environmental scientist and a geologist how they participate in advocacy, and you will get vastly different answers.

Dr. Chip Fletcher, professor in the Department of Earth Sciences at the University of Hawai'i and Vice-Chair of the Honolulu Climate Change Commission, describes his role as "an advocate for science". Dr. Fletcher gives frequent talks and has contributed a number of op-eds to local

newspapers; he is active on twitter, has participated in several TV interviews and contributes to a local radio segment called Planet 808. His goal, he says, is not to "convince minds… [that] climate change is real, should they already feel that it's not" but rather, "to inform", acting as interpreter to connect the dots between the scientific literature and "put them out there for consideration".

Dr. Stephen Mulkey, an environmental scientist at the University of Florida, directed a statewide project focused on climate change education, has given testimony on climate change to the Florida Legislature and led Unity College to divest from the top 200 fossil fuel companies, the first college in the nation to do so. Today, he writes a blog on ecology and sustainability called *The Environmental Century*, although he feels most impactful in the classroom. He noted that he is "assiduous" about letting his students know when he is sharing an advocacy opinion, and if there is any significant opposition to that opinion.

Dr. Orrin Pilkey, a coastal geologist at Duke University and James B. Duke Professor Emeritus of Geology at the Nicholas School for the Environment, says that he is "first and foremost, a scientist" but he doesn't "mind calling himself an advocate." When asked about the forms of advocacy and communication he participates in, he says he does it all– op-eds, books, talks– and that he's written over 250 peer reviewed journal articles.

What kind of advocacy should scientists participate in? Is there a definable line?

According to a 2003 study on advocacy and credibility of ecological scientists, under the traditional model of the role of the scientist, "scientists lose their credibility as scientists if they cross the line between science and policy or management".[ii] But where is this line exactly, and how do you know when you've crossed it?

The lesson learned from talking with these scientists is that a "line" is not the best way to describe the of end of science and the beginning of advocacy. More accurately, advocacy operates on a spectrum. To this end, I questioned if there is a portion of the spectrum that is

more appropriate for a scientist to participate in, and what that portion might look like. Should scientists write op-eds but not join protests? Is giving a public talk different than testifying in Congress? And what about social media?

It seemed to me that it wasn't the communication medium that mattered to my interviewees, as much as the content. To Dr. Mulkey, good advocacy is "rigorously science based" and "grounded, without equivocation, in the best science available." Dr. Mulkey believes that "if the science is equivocal about something, you must say so."

To Dr. Fletcher, it's important to avoid making personal criticisms– a position that admittedly, can be hard to maintain when dealing with individuals invested in denying climate change.

What some may deem advocacy, others may consider part of the role of science to guide decision making. One of Dr. Pilkey's proudest moments, he said, was "getting good science involved in moving North Carolina's Cape Hatteras Lighthouse." Having researched beach erosion extensively, Dr. Pilkey was certain that the lighthouse was doomed if it stayed where it was, and he helped form the "Move the Lighthouse Committee" that ultimately convinced the National Park Service to move the lighthouse half a mile back from shore. In hindsight, moving the lighthouse was deemed the right choice, but given the amount of opposition to Dr. Pilkey's position, one could argue that the distinction between advocacy and informed decision making was blurred.

Several of the scientists I spoke to admitted to facing criticism for their advocacy. As an aspiring scientist fresh out of undergrad, seeing these scientists on the other side, regardless of the criticism, is encouraging. For the sake of my own generation, I now ask:

How can we be both good scientists and good advocates? What does that look like?

To Chris Bird, newly retired Director of the Alachua County Environmental Protection Department, "being a good scientist and being a good advocate- there's a place for those two to overlap without really compromising the science." When it comes to climate change, it is particularly important that we determine how this is done; its global reach means that every human being has a personal stake in how we respond to the science and to the people who communicate it to us.

To this point Dr. Fletcher offered the following insight: "I'm a scientist. I am a father and a husband first. I am a voter, a citizen of the nation, a citizen of a planet. And I cannot isolate all these responsibilities. They all weave together to form the fabric of my voice".

Rykiel however, argued for a clearer distinction between scientist and citizen, claiming that "when communicating with the public, scientists must separate as clearly as humanly possible scientific information from personal preferences".[iii] This exact sentiment was echoed by another scientist I spoke with.

According to Dr. James Garand, a political scientist and Emogene Pliner Distinguished Professor at Louisiana State University, an important distinction should be made between value questions and non-value questions. The cause of climate change or the creation of a COVID-19 vaccine, for example, are non-value questions. What we do about climate change, and how to best support people financially and socially during quarantine, requires an assessment of values– issues that Garand believes are not as well informed by science. To Dr. Garand, "scientists have every right to enter the public arena as democratic citizens." But as a scientist, he said, "I want to separate out what I can tell you scientifically, and what I can tell you from a value standpoint."

So how does one maintain the balance between scientist and advocate? Chris Bird suggests looking to Dr. Wenliang, who continued attending to his patients while trying to communicate

the risk of the virus. I think that for many advocating scientists, this is key to maintaining balance– continuing to produce good science while advocating for accurate interpretation and application of that science.

Why might scientists choose not to take public stances/ engage in advocacy in a public forum?

There are several ways in which academia and research institutions may discourage advocacy, intentionally or not. In an academic setting, for example, tenure is awarded based on criteria like peer-reviewed journal articles and successful graduate candidates, not op-eds.

The desire to avoid controversy and its potential impact on reputation and funding sources may also influence the way scientists engage in advocacy at an institutional level. In Dr. Mulkey's experience, this factor impacted not only his advocacy but also the way his research was packaged. During his time with the National Science Foundation's (NSF) Directorate for Education & Human Resources, he said he was instructed to avoid using terms related to climate change on curated abstracts, at the risk that congressional aides wouldn't read them. Or worse, at the risk that projects would lose congressional funding. He noted that other departments within NSF, like the Directorate for Geosciences, were not subject to such strict guidelines.

Chris Bird added, "one of the motivators for why many scientists are reluctant to become advocates…it's simply that person's personal, financial, economic situation and if they're dependent on outside funding sources or maybe even their employers…And I think a lot of it just comes down to them being concerned about losing their income".

Another, simpler answer: many scientists feel that it is not their place to advocate. Of course, that depends on what someone is advocating *for*. What scientists advocate for and how they do it, is closely tied to the perceived impact on their professional credibility.

Almost all of my interviewees could point to activities that they felt would threaten a scientists' credibility. To Dr. Mulkey, world-ending doom-and-gloom statements about climate change are unhelpful and lack "integrity" just as much as climate denialism.

Dr. Garand believes that scientists could lose credibility with the public for two reasons: one, "irrational fear. So a scientist who says, based on the empirical evidence global temperatures are rising– there'll be some people who will distrust that person, because they don't like what the person is saying." And two: "when a scientist jumps out of their lane and takes a value position that is not supported by the scientific research, and they take that position in their role as a scientist, it creates this kind of distrust that I think that we sometimes see."

I offer another theory: that labeling a scientist an advocate, and thus burdening them with the responsibility of that label, is a way of keeping them from communicating the things we don't agree with. Is that not what happened to Dr. Wenliang, when police accused him of spreading rumors and making false statements?

Bird offered his own thoughts: "I think this whole stigma about scientist- advocates…it's a political ploy that's been used by the climate deniers and delayers to try to discredit scientists and to get people not to pay attention to you…to make them stand down by saying, oh, you're an advocate, so we shouldn't be listening."

In Dr. Mulkey's opinion, that is exactly what has happened to Dr. Michael E. Mann, a Distinguished Professor of Atmospheric Science at Penn State University. According to Dr. Mulkey, Mann is a successful scientist-advocate because "he cut his teeth in fire" defending the science on climate change while defending himself against personal attacks to his credibility.

But what of those who choose not to walk over the hot coals but still want to inform and educate the public with their science?

Dr. Fletcher offered the following insight: "We all have our lanes. And I think acts of courage come in many, many kinds. Giving up beef, becoming vegetarian, becoming vegan– those are acts of courage. Making personal lifestyle changes– those are acts of courage. Writing in a way that your writing gets pushed out, viewed by other people, that's an act of courage. There's a whole spectrum– all the way up to Greta Thunberg showing up on global stages and shaming the audience…and we all need to find a pathway of courage which leverages our natural gifts and passions. If you look deeper, I think you'll find a vast majority of scientists, they may not be doing public speaking, [but] they're engaged in acts of courage in other ways."

Has climate change changed the role of the scientist?

So, are attacks to scientific credibility simply painting scientists as advocates or turning them into advocates? Perhaps both. In attempting to obfuscate the science behind climate change, I argue that naysayers have created the environment for the scientist-advocate to emerge.

For Dr. Mulkey, the "watershed moment" that ignited his advocacy was the same in which his credibility as a scientist was attacked. According to Dr. Mulkey, while giving a special talk on the exponential rise of greenhouse gas emissions to the Florida Legislature, a state senator accused him of lying and had him dismissed. He recalls, "On the way home from Tallahassee that day…I became a different person."

One could argue that Dr. Wenliang was an advocate– he was advocating for our right to know about a potentially dangerous new virus. But when did communicating a risk become advocacy?

Chris Bird offered his insight: "if you get scientists or medical doctors, and again, I consider them a subset of scientists, if you discovered some horrible virus [and] if you were afraid to communicate that, because somebody said, well, you don't have enough data, you need to go back to the laboratory or, you didn't do more clinical tests, and we don't want to hear from you. If you start talking about this, then you're becoming an advocate."

To some, the nature of climate change requires new rules for the role of the scientist. As an emergency, one might ask not, is it the place of a scientist to advocate, but:

Is it the duty of the scientist to advocate?

To Dr. Mulkey, the urgency of the issue plays a big part in determining what role scientists should play. "If we were talking about some pollutant in the streams that was killing fish, I would say yeah, your job is to share…the data and stay out of the policy-making process. I agree with that. This [climate change] is a whole different level of ethical obligation."

Bird echoed Mulkey's opinion, claiming "the extent of emergency justifies a certain level of advocacy". He believes that "policy should be driven by science" and worries about the consequences in policymaking "if scientists are afraid to speak out" about the influence of misinformation.

For many, the risk of not speaking out on climate change outweighs the risk to one's credibility.

For Dr. Pilkey, questions of credibility should not always alarm. He claimed, "I destroyed my credibility many times. If you're doing something useful you're pushing the frontier somewhere [and] you're going to lose your credibility somewhere. It's part of the game…I consider it a measure of my success."

For his advocacy, not only was Dr. Wenliang's credibility questioned, but he was also accused of disturbing "the social order". Yet, we don't question whether or not Dr. Wenliang was justified in alerting his colleagues to his concerns or whether it was his place as a doctor. Why? Is it because there is truly a difference between scientists' efforts to communicate the risk of climate change and Dr. Wenliang's efforts to communicate the risk of coronavirus? Or is it because there is a portion of the population that may doubt the impacts of climate change as a true "emergency"?

The turn-around for the COVID-19 misinformation campaign was fast and acutely felt, and we now have the luxury of hindsight. Given this hindsight, *should* we and *could* we do better for climate change?

In summary of this extensive set of interviews, I offer these takeaways:

In light of the politicization and unprecedented risks posed by climate change, the traditional boundaries that once defined the role of the scientist are blurring. I think it's safe to say that the question of "*should* scientists be advocates" has sailed. The more pertinent concern now is:

How do scientists continue to advocate in the most responsible way?

To that question, there is no consensus. While this may seem like a non-answer given the work I've put into exploring the range of experienced opinions, I'd like to think of it as an opportunity.

My generation, as the one that bears the most responsibility for addressing climate change, can write the rules to fit our new reality. Thankfully, we have many role models and their best practices to look to.

On a parting note, credible, critical, responsible, science requires thoughtful reading in order to be useful to anyone. That's true of all information we consume. If we all do that much, I think we have the best possible chance to tackle the unprecedented challenges ahead.

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[i] Rykiel, E. J. (2001). What is, what might be, and what ought to be. *BioScience, 51*(6). 423.

[ii] Lach, D., List, P. Steel, B. & Schindler, B. (2003). Advocacy and credibility of ecological scientists in resource decision making: A Regional Study. *BioOne, 53*(2), 170-178. http://dx.doi.org/10.1641/0006-3568(2003)053[0170:AACOES]2.0.CO;2

[iii] Rykiel, E. J. (2001). What is, what might be, and what ought to be. *BioScience, 51*(6). 423.