

Science Journalism & COVID-19: Reporting for In-Depth Coverage

New York Academy of Sciences

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Moderators

Roger Torda, New York Academy of Sciences

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Panelists:

Sheri Fink, MD, PhD, *New York Times*

David Quammen, Author

Amy Maxmen, PhD, *Nature*

Roger Torda:

Hello, and good morning. Whether you're watching on Facebook Live or Zoom, welcome to our program; Science Journalism and COVID-19. I'm Roger Torda with the New York Academy of Sciences. I'll be hosting our conversation today along with my colleague, Dr. Srikant Iyer, who is the associate director of the Academy's Science Alliance, which supports early-career scientists.

The Academy is a global network of more than 20,000 members in 100 countries. Our mission is to advance scientific knowledge, address major global challenges with science-based solutions, and increase the number of scientifically informed individuals in society. This program is the second in a series. The first program focus on how general assignment reporter stepped up to the COVID-19 beat.

We're delighted that you're joining us today. We're thrilled to be joined by three, very accomplished science writers and journalists. Sheri Fink is a correspondent for *The New York Times*. She received a PhD in neuroscience and an MD from Stanford University. She transitioned to a career in science journalism and has reported on healthcare in war zones and in the aftermath of Hurricane Katrina. She has reported on Ebola in West Africa.

Our second participant is Amy Maxmen, a senior reporter for *Nature*. She's based in Oakland, California. Amy received a Ph.D. from Harvard in evolutionary biology. She has covered malaria in Southeast Asia and has reported on Ebola throughout Africa. In recent months, she has been reporting extensively on COVID-19.

David Quammen is the author of over 15 non-fiction books on science, nature, and travel, including *Spillover: Animal Infections and the Next Human Pandemic*, which was published in 2012. David reported from central Africa, Bangladesh, from caves in Southern China, in Australia, and from laboratories around the world. He explained why the world should expect another spillover of an animal virus to humans, one that could very well cause a worldwide pandemic.

I'd like to begin by asking each of you to share a story that represents some of your recent work reporting on COVID-19. Amy, you hopped on a plane for Seattle in very late February. Why did you go, what did you find and what did you file about?

Amy Maxmen:

Hi. It was towards the end of February. We have an Asia bureau at *Nature*, so they were mainly covering what was happening with COVID. But towards the end of February, it was pretty clear this was coming into my territory, which was the West Coast. There was a tweet from Trevor

Bedford, a geneticist at Fred Hutchinson Cancer Institute. He basically had looked at viral sequences and realized there had probably been hundreds of people infected in Seattle. So, I begged my editor to let me go and just meet the researchers there that were studying this.

When I got there, I met with an infectious disease scientist named Helen Chu. Basically, throughout February, she and her team were pretty sure this was going to be spreading in the U.S. since it's a contagious respiratory pathogen. They had helped develop a test that they weren't allowed to use.

By the time I saw her, it was around March 1, she said, "This is it. This is kind of our day zero in the U.S. Coronavirus is here, and it's widespread." And when I got there, they had tons of boxes in their lab for their home testing kits that they were finally getting people to send in, they were looking for COVID.

I also went to one of her colleague's lab at the University of Washington, the pathology institute, where they too had been wanting to test for this virus. They were using a more traditional test that the World Health Organization was recommending by the end of January. And they were not allowed to test because of FDA rules. So they also had gotten the green light just a couple of days before that. I saw people in his lab who were working overtime. So that story for me, it really woke me personally up because it's one thing to have thought, "gee, this virus might be spreading," and it's another thing to hear these leading experts in the field saying, "Oh, it's definitely here." And they were working overtime to try and get ahead of it.

Roger Torda:

Sheri, let's move on to you. Your reporting here in New York has been characterized by deep access inside of hospitals. Would you share one of your stories? I'm thinking perhaps about the maternity ward for women with COVID?

Sheri Fink:

Sure. I got to spend quite a bit of time at an independent hospital called Brooklyn Hospital Center. It's actually the hospital where Anthony Fauci was born, coincidentally. Every hospital has its own story. They are one of the few that doesn't have a parent company or other hospitals to support them or share resources, so that seemed to be an interesting space. Also, it is a safety net hospital, as many hospitals in New York are that serve a lot of people who are low income or might not have health insurance. So for that particular story, I was looking at this issue of pregnancy and COVID. As you know, we knew nothing about this disease when it first emerged in December.

Doctors were trying to understand this nexus with women who were pregnant. I think we now know more that there may be, in fact, some greater chance that they may be more vulnerable. There were a number of women, I think, three in the intensive care unit that particular day, for that particular story. So it was a story that just looked at what it was like to be pregnant and become critically ill with COVID. There was one woman whose baby had to be born by C-section just to try to save her life. And I was able to come back and follow her. Fortunately she did well, her baby did well, [and] they both went home. I think that piece came out on Easter, so it was one of those sad stories, but also... like a ray of hope.

I want to also just say for people who read it and might remember it, there was a second woman who was pregnant. She had also been in intensive care and went home and was able to keep being pregnant. She just texted me yesterday a picture of her beautiful baby, who was born and they're both doing well.

Roger Torda:

Thank you for that update. David, your recent work includes a story for *The New Yorker* titled "The Warnings, Why We Should Have Known to Prepare for COVID-19." Tell us about that story, why you wrote it, and what the message was.

David Quammen:

Yes. First of all, I'm really glad to be part of this today, so thank you, New York Academy. It's good to be here with my colleagues. That story began, I think, in early or middle March. I got an email one evening from David Remnick, editor in chief of *The New Yorker*, with whom I'd never worked before. But he came in out of the blue saying, "Look, let's talk. We want to get you doing something on COVID-19 for the magazine." So we talked on the phone about what I might do in this era, in this period when it's difficult, if not impossible, to travel. And I said to him, "Look, David, you've got 20 people who are better telephone reporters than I am. What do you need me for? What do you need from me?" He said, "Well, you've got a lot of reporting under your belt. Yes, I want your voice. Let's talk about what you can do, maybe drawing on some earlier reporting."

And I mentioned a fellow named Ali Khan, Dr. Ali Khan, who was at the CDC in 2006 when I was researching a story there for *National Geographic* about dangerous emerging viruses. I went up and down the corridors of the special pathogens branch for two days, most of two days. He was the deputy director. And then he said, "Let's go to lunch." As we went to lunch, he said, "Okay, Quammen, you've been talking to all my people, which of these diseases is your favorite?" He's got this dark, wry sense of humor. I said, "Well, Ebola is pretty damn interesting." And I remembered this because it was so striking in 2006." He said, "Yeah, I like Ebola as much as the next person, but to me, SARS was the one. SARS was the most dramatic outbreak I've ever worked on. SARS was the bullet that went whistling past humanity's ear."

"Why was that Ali?" "Well, there were a couple of reasons. It didn't burn out, we stopped it. We were lucky. We had strong public health. In these particular cities, we had good science. It was a coronavirus, which made it dangerous." So all of these things I had remembered. I mentioned this to David Remnick, and he said, "Yeah, that sounds like that could be a starting point." And I said, "Well, it relates to the warnings, all of the warnings. The warning of SARS in 2002, 2003. The warning of MERS in 2012. The warnings that I heard from scientists when I was researching my book, saying, watch out for coronaviruses, as well as influenzas.

So, with some telephone reporting and some going back to my journals, that essentially became the piece, about Ali Khan. I did a couple of long Skype interviews with him from his office, now in Nebraska. That became the story.

Roger Torda:

Sheri and Amy, I'm presuming that you equally were aware that something like COVID-19 was facing the world at some point before the outbreak actually started. I'm curious all the same, what was the moment when you realized that COVID-19 was, in fact, a big one? I think, Amy, you touched a little bit on this when you were describing your trip to Washington. This is a two-part question. What was the moment you realized this was the huge story that you might have been expecting at some point, and what caught you by surprise all the same? Sheri, do you want to take a stab at that?

Sheri Fink:

Sure. Well, I had just completed co-creating and co-executive producing a series called "Pandemic: How to Prevent an Outbreak." So I've been spending many, many months and years actually, thinking about the subject of the next pandemic. But I was in the middle of another

project, and the reports started coming out of China. I was just feeling an awful feeling in the pit of my stomach all through; I don't remember the dates but in January. I was listening to all the WHO press conferences while I was trying to finish this other project that, of course, has not been published because of COVID. So I don't remember there being a single moment, but, of course, it was super on my radar because our launch date for "Pandemic" was January 22....

You always want to think about, number one, does it pass from person to person? And number two, does it have the capability of causing severe disease? Those two features became clear very early on.

Roger Torda:

Even if you were fully expecting something like this as you described, what specifically about COVID-19 might've caught you by surprise or might have unfolded differently than you might've expected?

Sheri Fink:

We all know theoretically all the things that these things can do, whether it is the disease part or the science part, social disruption, fears, disbelief, pushback, political upheaval, all of that is known to anybody who's studied the history of epidemics. But I guess, with any disaster, those tend to be the things that I report on. I report on medical disasters of all different types, but each one throws you something a little different. This one has many continuing mysteries. There are so many things we don't still know that surprise us and that we think we know, and then it changes. So that's been one feature of this, just how much it changes.

And then, of course, you can know something intellectually, but living through it is a different experience, even for those of us on this call, who've gone to pandemics and epidemics or outbreaks. But I guess when it hits your hometown, that can feel a little different, too.

Roger Torda:

Amy, do you want to share something about what might have surprised you about COVID-19?

Amy Maxmen:

It's been surprising to me. Like Sheri was saying, in January, it became clear this was contagious, with human-to-human transmission, that it was deadly. What surprised me, back in January, I was thinking, really worried, especially about low-income countries. I was thinking these are the places where the health system is super weak, where they're not going to be talking about ventilators at all. And at that point, I still was under the belief that we had a really strong public health system in the U.S....

I was traveling in Sierra Leone for a few months during the Ebola outbreak. When I came back, there was so much attention on me from the CDC and from public health departments, that I was under the impression that we had a quite a strong system as far as that went. So what I was surprised at was the lack of action from the U.S. in February and March. And I think that to me, that was what was surprising.

When I've gone to other countries – to DRC during Ebola, to Nigeria, and other places – you're talking about places where maybe labs somewhere have a PCR machine. But do they have a generator, and also a backup generator to run it? And then where's the fuel going to come from? And how does the fuel get there? It's this really challenging process. I was under the impression that – because probably at this point, there are many high schools that have PCR machines in the U.S. – that that would not be the problem that it was here. And the CDC is well

known abroad. So I think for me personally, the surprise was really that wealthy countries were as challenged, if not more challenged by this.

Roger Torda:

What struck me about your article in *Nature* about four poorer countries, Nigeria, Peru, Kenya, and El Salvador, is that the article seemed to be saying that countries that did not have such robust healthcare systems as the United States could not afford the luxury of delay in any type of aggressive response and yet the United States, in some way, failed to meet that challenge. I mean, were you struck by the early reaction in those countries by the sense of urgency, and the lack of urgency expressed in some quarters here in the U.S.?

Amy Maxmen:

I should say, nothing's across the board. It's not that every country that's low income responded very quickly, but I intentionally pick some that were low and middle-income countries that were taking extreme measures, even before they had a case, closing borders and imposing lockdowns where people were arrested if they went for a jog or something like that. Peru was setting up isolation centers before they had a case. Nigeria was scaling up testing before they had cases in the beginning of February. Was I surprised by that? That makes sense. I was surprised we didn't do it in the U.S.

Roger Torda:

David, you've spent an awful lot of time also anticipating something like COVID-19. What caught you by surprise all the same when it came?

David Quammen:

There were three things that surprised me, Roger. There're some overlap with what Amy just said. Because she mentioned Ebola, let me just quickly say something more about Ebola and Ali Khan because I didn't put him fully in context. When he jokingly said, "Which is your favorite?" and he said, "Ebola. Yeah, I like it as much as the next person," he is a guy who has worked a number of Ebola outbreaks in Africa. He has risked his life to help people get through Ebola. He doesn't trivialize Ebola. He was just having one of his dark jocular moments there.

So, what surprised me? Three things. First of all, when we started to hear that there was silent spread, cryptic spread, shedding of virus by asymptomatic infected people--that really was a chilling thing. I can remember people back at the time of SARS, original SARS saying, "Well, how could this virus have been worse?" Well, it could have been worse if we had had asymptomatic spread. We were very lucky that we didn't have people walking around feeling fine, going to work shedding virus. So when we found out this virus had that capacity, that was really an alarm gong.

The second thing that surprised me was how unprepared we were in many countries around the world, particularly the U.S., to deal with it. I had been told, again, ten years ago by Ian Lipkin, a fine scientist at Columbia Mailman School of Public Health, that he, for one, was working on a system of very, very fast, real-time diagnostic testing for a new virus, brand new virus. Get the genome, put it on a chip, put it into handheld diagnostic tools, get them out to airport checkpoints around the world so that within a few days you would have people being tested positive or negative for a new virus in the period of time it took them to go through airport security. I thought, well, that was ten years ago. Ian Lipkin was talking about it; we must have that. Low and behold, we didn't have anything like that diagnostic capacity.

The third thing that has surprised me is, since probably early February, I have been bracing myself for what was going to happen when this virus got into cities in central and sub-Saharan Africa, with brilliant scientists and brilliant public health people [but with] inadequate healthcare resources. What's going to happen, I thought, when this virus gets into Kinshasa? I thought it was going to be very grim. I'm still wondering why – and Amy has written about this and in a couple other countries, in Africa, Nigeria, and Kenya – and I am still surprised, pleasantly surprised, this hasn't hit the big teeming cities of sub-Saharan Africa harder than it has so far.

Roger Torda:

Let's move on to how you folks do your work, what techniques you use to communicate science to your audiences. You have, I think, an interesting range among the three of you, of techniques that you use. Sheri, could we begin with you? It seems like you made a very deliberate decision early on that you needed to report from the inside. Could you talk about what you decided to do, how you got inside hospitals, and what are some of the logistical challenges that you faced in doing so?

Sheri Fink:

I guess that as a physician myself by training, I practice journalism now, that was a natural place for me to go. I've been very interested in how hospitals respond in emergency situations, have spent a lot of time in hospitals in other types of disasters, such as hurricanes. The work that I did in West Africa was going to accompany a team in an Ebola treatment unit and chronicle that treatment. After the Haiti earthquake, I went and again, with a field team that was providing care. So that's an interest of mine and something that I think a lot of the public is interested in too. Obviously, any of us can end up in hospitals, have loved ones in hospitals. Many of the people watching this probably have, so what is that like behind the scenes?

And then, of course, there are all of the people working in the healthcare industry, which is a huge number of people. We're curious about them and their willingness to put that duty, to care for people, or to work in any capacity in a medical type of situation, to put that above their own personal safety. That's writ large throughout the health system and among essential workers in many industries. So, that's just the one story I tend to know the most about. So, that seemed the natural thing.

I always feel like as a journalist, the most important thing when you go out to do a story, or even on the phone, I suppose, [is to find] folks who are willing to let you in and who want to show the public their reality and don't feel the need to overly shape that or control it, who are really confident enough in their institution and the people who work there to really show that. So it wasn't so much which exact hospital [I ended up at] but really the ones, I think there were about seven, that were open to that. So, I was really fortunate to be able to do that. I think it was something I was curious about what is that work like?

Also, just the insights into this illness that you get [for example, about]... the burden of disease. We're hearing a lot now about the uptick in positive tests in other parts of the country, and there's debate over whether it's just that we're testing more. But that hospital seeing patients is sort of like the ground reality. If that's going up, then you know that there really is an issue. So I think that was the other thing, shedding light on the staff, shedding light on the patient experience and shedding light on the disease, too, and the evolution in what we knew about everything from how to protect people who are coming into contact with people who have the virus, things about testing and things about the disease state itself that were shifting, and how to treat it...

Roger Torda:

How did you protect yourself? I believe you worked often with a photographer. How did you protect yourselves? Were you scared for your personal safety at any point inside those environments?

Sheri Fink:

I'm lucky because before I went to West Africa, I took a course at the Center for Domestic Preparedness, in Anniston, because I was going with a team that was going to be starting an Ebola treatment unit. They went through a standard training that, I think, originated with Doctors Without Borders. It was very much about PPE. And of course, the way Ebola is transmitted is different, from how COVID is, some of those concepts are similar. So I had gone through that, and that was super helpful, just conceptually about how you can protect yourself.

I had some of my gear from that time. Of course, the N95 masks were expired, and you think, how can a mask expire? And then you go to put it on and, these are the duckbill ones, and you stretch it over your head, and it snaps, the elastic snaps. Sadly, some of our healthcare people in the trenches, in the healthcare system, had the same experience. I had a friend who's an emergency room doctor in Los Angeles who did a little video the first night in the emergency department when they had a suspected case. Somebody brought him a box of masks, and they were expired, and the same thing happened over and over, the elastic was breaking. But in any case, I had the concepts, and I taught them to the photographer. And then, of course, we obeyed the guidelines of the hospital, which were, of course, at that time, changing a lot.

It was important for us to bring our own gear as much as we could because they were in short supply at the time. But we felt, obviously, that [our reporting] was important, and they did too, to help the public understand more.

Roger Torda:

Great. Thank you. Amy, what techniques do you use to communicate science? You have a very extensive network of scientists you seem to tap into. And you often use the technique of profiles in writing your stories. Are those important techniques for you, and are there others I have missed?

Amy Maxmen:

Oh yeah. I like profiles a lot. As far as my network of scientists, I would say it's always growing. There are certain sources you talk to for a story, and they're excellent on the phone, especially if you know they pick up the phone and they like to talk...

When I went to Seattle, I had the same leftover things [PPE] I had from Ebola outbreaks, which I took along with me. But that for me was the last time I've reported in person on this outbreak, unfortunately.

So that's why that network of scientists is really important because I'm no longer able to just hang out and hear the side stories, which is what you really want, not just the story that you think people are writing about right now. So it's nice to have a network of scientists that I can talk to on, say a Sunday or something like that. Not about a particular story, but they can tell me what's going on with them or what they're hearing about. And that's really helpful.

And yes, I think profiles are a great way to make something that's as boring as health system strengthening come to life because you can tell a story about an interesting person overcoming something challenging, and that's a natural story.

Roger Torda:

Does that help you when you're pitching to an editor a story to couch it in terms of a profile?

Amy Maxmen:

I think so, I think so. Yeah.

Roger Torda:

How do you use Twitter or social media in general in your reporting? Does that help you connect and stay plugged into your network of scientists?

Amy Maxmen:

Well, I definitely look at Twitter a lot lately. It is useful. There's some new people I've found through it, some new researchers. It's interesting to see certain papers that are coming up now. We have a lot of preprints coming out before publication, so it's a great place to see those sometimes. I think it can also be sort of a treacherous place because you can get stuck thinking that the issues that people are talking about on Twitter are the biggest issues.

Something I definitely know from reporting abroad – that maybe David and Sherry can also talk about – is sometimes the people who are doing the hardest, most important work are not on Twitter. So you can get into a bubble, of thinking the big things are the things people are talking about on Twitter when, in fact, it's not necessarily true.

Roger Torda:

Sheri, David, how do you use Twitter? Is it universally helpful, or do you get into a bubble?

Sheri Fink:

I read Amy.

David Quammen:

Yeah, I read Amy too. Twitter, it's occasionally useful to me. For instance, yesterday, I was looking for a scientist fellow named Chris R. Shepherd, who had co-authored a paper about pangolin traffic in Myanmar into China. He was working then for the organization called TRAFFIC. This was five years ago, and I'm doing a story on pangolin now, pangolin and SARS 2. I wanted to contact him, and his email was expired. He's no longer working for TRAFFIC, so I found him on Twitter. I think maybe I just went on Twitter and said: "anybody know where this guy is?" And immediately, I was in touch with Chris Shepherd. So it's useful for that.

I don't use it much beyond that. There are some scientists who I follow who occasionally publish an interesting thread about the molecular evolution of the virus. Andrew Rambaut, in particular in Edinburgh, is one that I follow. So it's important. But this is a difficult time for me because Twitter is not enough, telephones are not enough. My first operating principle, usually when I'm writing about science, is go there, get on a plane and go there. I like to go into the field with scientists who are doing the field side of research on these diseases, and that is not possible right now. It's a real constraint that has to be worked around.

Roger Torda:

David, we were talking with Sheri and Amy about technique. It seems to me that your work represents another aspect, another approach to science communications. You have the luxury of longer periods of time to do reporting and research; you have more space in a book to tell your story. And you also have the opportunity to tell a longer story arc over time, it seems to me. Could you talk a little bit about how you use longer-form journalism or longer-form science writing to communicate differently?

David Quammen:

Well, yes. I mean, I don't report in short timeframes the way Amy and Sheri do. They do longer things obviously, too, in books, but I don't do short turnaround things at all. It's just not my niche. I do either longish magazine pieces, or I do books. Another of my operating principles is that people want to read about people. If you're writing about science, you still need to write about people. Not necessarily writing straight profiles, but just to some extent, I write profiles that are embedded in my books. I tell the stories of not just explaining science, but telling the stories of how particular people have done particular science, made particular discoveries, followed particular threads. So it's narrative, I try and make it narrative as well as expository.

I write these long, desk thumping books that take me five years or eight years. There are a lot of human stories embedded in those and a lot of scientific explanation as well. Some people say, well, these are big woolly bags that are unstructured. They are, in fact, carefully structured, but I like organic structure. For me, it comes from the fact that I don't have a PhD in science, I don't have an MD, I'm a science journalist practicing without a license, with no formal training in science, but then again, no formal training in journalism. I started my writing career as a fiction writer. I published novels, and then I drifted into non-fiction. Although I am very strict with myself in terms of what qualifies as non-fiction, no invented quotes, no composite characters, no blurring the line, except when it's obvious that I'm intending to blur a line, when I state that I'm blurring the line, between fiction and non-fiction, which I have done a few times.

I've put together books that are composed of strictly reported facts and quotes, but I try and turn them into artistic shapes. That partly has to do with my background as a fiction writer and in my years of obsession with the novels of William Faulkner.

Roger Torda:

It seems to me that in *Spillover* you did really tap your background, at some points, in non-fiction. I'm thinking of the section on The Chimp and the River. Could you explain a little bit about that section and the approaches you used and the choices you made?

David Quammen:

Yeah. There is one long, I guess I'd call it a chapter, one of the nine or ten chapters of the book, *Spillover*, is devoted to the origins of the AIDS pandemic, the origins of the HIV-1 group M virus, which we now know comes from a spillover from a single chimpanzee into a single human in the southeastern corner of Cameroon back well before what we think of as the beginnings of AIDS, back around the beginning of the 20th century, around 1908, give or take a margin of error. Those realizations come from the very solid molecular work of a couple of scientists and their group. Beatrice Hahn, then at the University of Alabama, Birmingham, and Michael Warby at the University of Arizona.

I started reading their works, their journal papers, and it gave me this framework. That's where the pandemic strain of HIV spilled over from one chimp into one person, in the southeastern corner of Cameroon. Beatrice Hahn talked about what she called the "Cut Hunter" hypothesis. The hypothesis that there was a hunter who killed and butchered a chimpanzee. And then he or she, the hunter, became exposed to the blood of the chimpanzee and the virus through a cut, perhaps on the arm. So that was Dr. Hahn's Cut Hunter hypothesis. And then there was a big gap. How did we get from the cut hunter, this hypothetical cut hunter, to the pandemic that emerged in the early 1980s?

So I wrote a speculative scenario of how this virus got from that first cut hunter down the rivers, out of southeastern Cameroon down the little Ngoco River to the Tsonga River, down the Tsonga to the main stem Congo into the cities of Brazzaville and Leopoldville as it was then, and

then onward to the world. I tell the reader, okay, this is hypothetical. I'm telling you a story of how this might have happened. I create characters, hypothetical characters, the cut hunter, the voyager, and I tell the story using fictional techniques to get this virus down the river and into the cities of Brazzaville and Leopoldville. And I wouldn't ever do that without saying to the reader look, okay, this is hypothetical. I'm imagining this, and I want you to imagine with me how this might have happened. And then I fill it out with a lot of, you would have to say, fictional technique.

I thought at the time that it was risky, that I might get a lot of pushback on this. People seem to have understood what I was doing and recognized the hypothetical nature of it. It seems to have been a useful technique.

Roger Torda:

I think it was.

Sheri Fink:

And the grandchild didn't sue you?

David Quammen:

Who didn't sue me, Sheri?

Sheri Fink:

The Cut Hunter's granddaughter.

David Quammen:

No. Nobody has sued me so far, no.

Sheri Fink:

It is good to make jokes in the middle of disasters.

David Quammen:

Yeah, it is. That's important.

Roger Torda:

Sheri and Amy, David just said to me you practice science without a license. Sheri and Amy, you both are scientists, have backgrounds in science-

David Quammen:

They have licenses.

Roger Torda:

You have licenses. I'm wondering how that helps you, and does it ever get in the way? The question that comes to my mind with it getting in the way is, do you ever kind of forget that you understand what your sources are talking about and that your readers may not? Or are there other ways that... I'd like to hear you talk about the advantages and if there are any dangers, perhaps, in knowing too much about the science that you're reporting on.

Sheri Fink:

I've thought about this a lot for years. I have a lot of little things that I believe about it. One is, I guess, that if you're inculcated in a professional field, you see the world in a certain way, so that's why there's a real value to David Quammen because you also want people who didn't grow up professionally in that world who can look from the outside and maybe more critically. So that's one thing, I think.

Another is that I always view it as a head start, but science moves so quickly, and we're seeing that with this virus. So, the fact that I got a PhD and an MD quite some time ago, it's like a head start, it's a common language, but I never ever consider that I really know something. These fields are so specialized. So even if you're an active physician or you're an active bench scientist, you would never assume that you understand your colleagues' work because it's also very specialized.

And then I think the question you're asking, which is, journalistically, what are the pitfalls, I guess, of having the same professional degree, let's say?... I went through a program through the AAAS, the American Association for the Advancement of Science. They publish *Science* magazine. For many, many decades, they've had this mass media fellowship, and it's for science grad students to spend a summer in a newsroom. I think the original idea was that it was supposed to bring budding scientists into newsrooms to make science journalism more robust, but it converted a lot of us into journalists. So that was one important part of my path.

But I remember as we did that, we had a little orientation and a mini journalism school for a week. That's a license I don't have, J-school. But I remember them saying that if you want to quote a scientist and you're coming to them at, let's say, you're in the same field, doing your PhD in that field, obviously you want them to speak to you as if it's not you. Because, of course, there's so much awful jargon in these fields. That's our job as reporters, is to translate that into real English. I love that part of the job because I feel like to be able to translate it, you really need to understand it. So it's a really good exercise.

You find the best science communicators who are in the sciences. The more you understand your field, the better you can do that translation. But we often forget that a lot of the words that we use among colleagues are jargony. So that, I guess, would be the one thing to remember. If I just need them to talk to inform me, they don't need to do that translation. But if I'm looking for a quote for a story to explain it to somebody else, then, of course, you want that [translation]. Often, I don't tell people my background. It's only when it's really relevant do I do that.

Roger Torda:

Amy, how about you, do you tell people that you're a scientist when you're reporting?

Amy Maxmen:

No, never. No, I don't. I don't think the PhD actually helped until ten years into journalism. I think I jumped over about ten years ago. Only now it looks good in respect, but it really was a waste of time for a good five or six years there.

Sheri Fink:

I remember there was a little bit of a bias against having a professional degree if you were becoming a journalist.

Amy Maxmen:

I think I actually get it, to be totally honest, because writing is so hard, it's so hard for me. When an editor has a ton of writing experience, I worship that. If they have a PhD, sure, that's fine. Yeah, I think there can be a bias against it because, right, just because you have a science background doesn't mean you know anything about how to write.

David Quammen:

Although at the great science writing program at UC Santa Cruz, if I'm remembering correctly, they specifically require an advanced degree in science to be admitted to their journalism program, I think. At least they use to.

Sheri Fink:

I did have a narrative of guru, say to me once early in my career, something like... what was it? "You think you can write? And I'm going to go do brain surgery tomorrow?" But it's not so absurd. I totally agree with you, Amy, that writing is much harder than a lot of these other things that you get, these long letters after your name, it's really hard. You have to really apply yourself to become a good writer. That's part of why probably you and I wanted to do it; it was just this huge challenge. So we shouldn't minimize that, and in a way that that person was sort of right.

David Quammen:

And then there's the related factor or problem that scientists are being told, "You need to communicate with the general public, you need to. You need to be able to talk about and write about your science because you're operating on maybe, in a lot of cases, public funds or whatever." I hear from scientists all the time, "Help me understand how to be a writer because I'm being told that I need to communicate better." I always tell those scientists either individually, or if they ask me to speak to them, "Your job is hard enough, you shouldn't have to be a writer." Being a writer is hard; being a scientist is a full-time job. It's very hard. Yes, you're being pressured to communicate your findings and your work to the general public, but think about it this way: do that by carefully choosing which writers, which journalists you're going to give time to, that you're going to let into your world, and then let them do the communicating for you. Don't let in every journalist who calls you on the phone and says, "Can we talk?" But be selective and invest some time in the right writers, and they will communicate your work to the general public for you.

Amy Maxmen:

I'd agree. I think, yes, that's totally true. For me, a good source is often just somebody who talks and who talks pretty openly, so that's it. And then I was thinking for the science background question, the part that helps, which can also be learned from somebody who has a background in writing or in English or anything else, or no formal background... it's the principles of science that really matter. I think with COVID, [for] a lot of science journalists, the job is really a kind of curation, and just asking, how do you know the thing that you know?

If there's a study out there that says the virus is more deadly or something like that, well, then how did they figure that out? How do they know that? I think that's a skill that can be learned as well, and just learning what's a correlation versus causation? Or I like that you lined up in your story about HIV and apes, this is a hypothetical situation. I think too often, actually, there is a lot of scientific unknowns where scientists or their PR people or journalists who aren't doing due diligence will present something that is, in fact, pretty hypothetical as a fact, and that's dangerous. So it's great that you billboarded it right away.

Roger Torda:

You talk about science that hasn't yet been proven. Bringing us back to the COVID story, how big a problem, for each of you, has been some bias against science that you may have encountered among your audiences? Is it a problem?

David Quammen:

It's certainly a problem. I mean, polls show that 40% of the American public doesn't even want to believe that humans are the result of evolution. Huge numbers of people don't want their kids to be vaccinated. There is wariness of experts of all sorts because of that rugged individualist, curmudgeonly, civil-liberties-above-every-other-consideration strain in the American character and scientists are one form of expert. That is certainly a problem. That's one of the things that I think has helped to unleash all the crank theories and rumors about this particular situation, this particular virus that had been flying around on the internet. People would rather believe an exciting conspiracy theory than a more dry scientific explanation.

Most people are not attuned to, I'll use a polite word, are not attuned to the critical thinking involved in telling the difference between a rumor that somebody is calling a report on the internet and a scientific study, a peer-reviewed scientific study, or even a preprint of something that has gone up on bioRxiv. We could talk a little bit maybe about the danger of speed in a situation like this when things are being published in preprint form before they have been peer-reviewed. But still, you can look at those, you can see this is a scientific study. This is not just a report that somebody concocted or pulled out of the air. That's a terrible problem right now because so many people want to believe what's exciting.

"Oh, this is an engineered virus created by the CIA or created by nefarious Chinese scientists in a laboratory in Wuhan, or it's a laboratory escaped virus." Many people, certain people want to believe those kinds of things because they are more exciting than reality and because they jibe with their political biases.

Roger Torda:

Amy and Sheri, how have you encountered, and how do you deal with either lack of science literacy or anti-science bias?

Sheri Fink:

Well, everyone just believes the *New York Times*.

Amy Maxmen:

There you go.

Roger Torda:

Amy, they believe *Nature* too. Okay?

Amy Maxmen:

Well, I feel like if you are reading *Nature*, maybe you believe *Nature*.

David Quammen:

They're reading *Nature*. If they're reading Amy in *Nature*, you've already won the battle with them.

Amy Maxmen:

Yeah. It is a trade magazine in the end.

Sheri Fink:

But you're also writing for Twitter, and that must be a different.

Amy Maxmen:

It's true. I wrote one feature on misinformation. During that, I did ask people, okay, what's the way to combat this? In no way am I able to combat the whole thing, but I guess some little tips

they shared that are maybe useful are, one, if it's a rumor that isn't very popular yet, it's not worth maybe blasting it out to everyone with a hashtag. Even if it's to say, look at these people, aren't they crazy? That actually just helps spread this virus or the viral meme idea. If it is popular and you are going to write about it, you want to flag it upfront like it's absolutely not true that Bill Gates is going to insert microchips into people that doesn't even make sense. Something like that, so you could combat it right away.

And then the other thing that people told me was, if possible, it's better to have a one on one conversation with somebody versus putting it in a thread. So for example, if you know somebody on Facebook, who's sharing something that's obviously very stupid, first of all, telling them they're stupid, isn't going to help very much. Secondly, even on a public forum, I think saying it's wrong is maybe not as effective as trying to privately say it. All that aside, as David was saying, there's going to be a large segment of people whose prior beliefs are going to support a conspiracy, and I don't know how to confront that.

Roger Torda:

Okay. Let's move on to a Q&A from our audience. Srikant, my colleague, is going to join us now. He's been reading through questions that have been coming in. Srikant Iyer, would you join us? Do you want to share some questions and perhaps address them to specific members of our panel?

Srikant Iyer:

Sure. First of all, thank you so much, guys. Thanks for saying that writing is hard. I think a lot of scientists just breathed a sigh of relief. There's been a lot of questions circling around the accountability question and also about the mixed messaging that you already have covered. I wanted to get into a couple of specific questions. What do you consider the most effective way for journalists to expose and hold accountable policymakers? Facts do not seem to matter in our political climate, and that fact is resulting in unnecessary debt and poor policy choices. So what are some of the techniques and innovative ways we can use to connect with the audience? And bring in more of this awareness? This is open to all three of you.

David Quammen:

Silence because it's such a difficult question to answer. How in the world do you hold policymakers accountable?

Sheri Fink:

Well, that part is inherent in the role of journalism. We hold power to account, and it's our job to keep doing that whatever the reaction is. We file public records requests; we write stories; we consult experts; [and] we look at how things worked in the past and how they work now. So all of that is stuff that we do as part of our journalistic mission. Certainly, *The New York Times* and my colleagues are doing that every day. But this question of how to deal with the fact that a lot of people don't believe it, I think it's tough.

We've seen throughout history that when populations have different versions of the truth, how that can lead to conflict and a lot of other difficult things. Not that truth shouldn't be challenged and that there aren't different viewpoints or perspectives or lived realities. And I think we're having a big discussion about that, that my reality and your reality may be different for many reasons.

But for those of us who do believe that there is some value in at least striving for objectivity, science is the model, right? We have a scientific method, and a lot of us believe that there's

value in that and that there is some objective truth to strive for or to discover. But it's at a low point and certainly the ways that we communicate now, just enhance that and speed it up.

There have always been rumors and things that aren't true that are believed very firmly. But I think the pace at which that happens now is different and challenging. There doesn't seem to be a great solution for that, I know. But I just spoke for a long time about something I have absolutely no answer for.

David Quammen:

In addition to that, we talk to people whose voices have been excluded from policy discussions, policy debates; in some cases, they have been fired from policy positions, and their voices have been, to some degree, silenced. We talk to them, we quote them, we amplify their voices. We've all heard about the directorate of pandemic preparedness at the National Security Council that was dismantled over the last three years.

From *The New Yorker* piece that I did about warnings, I talked to Beth Cameron, who had been the director of that and helped to amplify her voice. There are other people that we all talk to all three of us and other journalists, people whose voices should be part of the public policy debate and they've been marginalized, or they've been fired from positions for speaking truth to power. And we can help amplify their voices again.

Roger Torda:

Srikant, you want to move on to another question?

Srikant Iyer:

Yeah. A quick pivot. What are some ways a PhD graduate student can assess whether they are cut out for science journalism? What are some skills that are prerequisites for science journalists?

Amy Maxmen:

I can try it. It's funny, I did the AAAS' fellowship that Sheri was talking about as well. That was how I got into it. That fellowship is nice because it is also for scientists who might want to go back to science. So that gives you a sense of, how do I feel not being at the bench and reporting on any number of things, sometimes things I didn't think I was going to be interested in, or maybe I'm not interested in? So the prerequisite is, I would say, enjoying shifting gears, enjoying having to be a novice over and over and over again and not know about something again and again, whereas, in science, you get to kind of become the expert and become more and more of the expert.

So appreciating that fact of it that you're constantly going to be in that position. You're constantly going to have to ask scientists, you don't know what they're talking about. You might not make other scientists proud. So the whole, I don't know, the metrics back aren't going to be the same. And you've got to like writing, unfortunately. I don't even love writing to be totally honest with you, but you can't hate writing.

David Quammen:

Can I jump in and amplify that? Can I jump in here? Yes, if you're wondering whether you're cut out for it, ask yourself, do I like to write, do I like to write enough to write, even if I'm not being published, let alone being paid for it? Writing is painful, yes. Writing is hard, but if you don't like writing enough to write without being published, then don't think of writing in any form as an answer to the question, how am I going to make a living? It's not an answer to that, it's not a

good answer to that. It's something you do because, however painful it may be, however difficult it may be, you love doing it, or at least you like doing it.

Srikant Iyer:

This is an interesting question... Right here in New York City, there are more than 80 live animal markets all in heavily populated, low-income neighborhoods. With public health experts sounding the alarm about the catastrophic threats posed by live animal market, do you think that such a market should be allowed to continue to operate? Are they a ticking time bound for a bird flu or related zoonotic outbreak, or has New York City just been lucky so far?

David Quammen:

That's from Matthew Schwartz and boy, do I want to get in touch with Matthew Schwartz. Matthew, let's make contact by Twitter or something, so I can learn more about what you know about those 80 live animal markets in New York City. If they're markets for wild animals, then they're dangerous, very dangerous. They are spillovers waiting to happen. And it's important for us to remember, to be reminded by Matthew Schwartz that this is not just something that *other* people do, that *those* people in *that* country *over there* do, it's happening in the U.S. too. It's like piling newspaper around a campfire, it's the place where things that flame up are going to start.

Srikant Iyer:

Thanks. You guys brought up preprints... We're always sort of in this rush to find the latest information as we go along as well. As people who've sifted through the data and have gone through all the work that comes in, what are some of the ways that you guys catch yourself or say, call yourself out, saying let's just wait for more information? Or, have you had any experience that you would like to share with us when you've had to take a pause and dig a little deeper into this moment when we're all rushing to find the answers and questions?

Amy Maxmen:

I can say what I would do with preprints. One is, if it seems like a straightforward thing, here are some statistics on, say, there are this many cases, and this many people had a cough, I feel like, maybe I can tweet it if I think it's interesting data that people will find interesting. I could tweet it out. If it's something that I think warrants maybe a deeper story that could be, say, the virus has mutated to become more deadly, that's not really known right now, then I might reach out to the scientists I know who might be able to answer that question. And before I would run with that story, I would ask them what they think of it first.

Sometimes I have a thought, I don't know if it ever will go anywhere, but I sometimes wonder if scientists would ever be willing on their preprints to put a two-sentence note at the top that says what's the take-home message to the general public? That would be my personal hope just because not every newsroom has science journalists in it. So it would be nice just to say, "Hey, this is what we found from this thing, but it doesn't mean you should change your behavior." That would be my own thought.

David Quammen:

Sort of an abstract of the abstract.

Amy Maxmen:

Exactly, because actually I have a very hard time reading abstracts even.

Srikant Iyer:

Amy, you've just given me an idea of how to run a workshop. I do this with the students I work with.

Amy Maxmen:

I want to see it happen. I think the fact that people are seeing preprints right now, we can't just put our heads in the sand and pretend they're not there.

Srikant Iyer:

Thanks. We got a lot of questions asking about [conflicting information]... mixed signals about should we wear the masks, or not wear the masks. As a result of it, early on, there's been a lot of xenophobia that's also crept into it. A couple of people have asked if I'm put in a situation like this, as a scientist, what are some of the things that you recommend I should highlight? So that I can at least enter into a conversation of deciphering how to tease out these nuances.

David Quammen:

I'll add one thought on that. That is, I think it's important for us, as we write about science, occasionally to note the things that science doesn't know, the limits of scientific knowledge, the limits of confidence and the limits of scope. Readers who are too trusting might be inclined to just feel like, well, science knows everything with a great degree of positivity. No, science doesn't know everything about this virus. There's a zillion scientists who are working on this virus now, and there's still lots of mysteries about how it works. That flows onward into public health applications of science, like masks, masks for whom, masks when, how much does it help?

The transmissibility of this virus, how long does it hang in the air, how long does it hang on a piece of plastic? There are all these things that we know a little bit about, we're starting to know about, but we don't know in totality, and we don't know with absolute confidence. I think it's part of our duty as science writers to remind people that science has limits, limits of confidence sometimes, and limits of scope. There's a lot of things for which there is not yet a scientific answer.

Sheri Fink:

That things might change, and that's not because somebody necessarily was saying the wrong thing to you at the time. At the time, that was what was known or what was believed; then further studies shed light on something else. I think the tendency in the public, of course, is to want to know everything. This is a real issue for leaders and policymakers who have to make decisions and policy decisions based on really imperfect information, very imperfect situational awareness as it's called... I think what helps with that is transparency.

I remember 2009. We talk a lot about those of us who covered the H1N1 Flu, how, at least in the U.S., every single day, the CDC was giving us briefings. We were just kind of like, here's what we know today, here's what's changed. I think that if that's the expectation if the public knows that nothing is definitive yet... that this will be an evolving situation, and that we may need to switch course... [then people will understand] that the things that are recommended one day or not recommended might change. If that's an expectation, which is reasonable when it's a new disease, then I think maybe people won't be as freaked out about it. But confused by it, absolutely. I'm confused, and I'm following it.

Amy Maxmen:

Yeah, the messaging right now is very tricky because we don't have the daily updates. ... [it is not being explained] that people are making recommendations based on available evidence. It

would just be nice to be able to talk about that. Should you wear a mask? If you want to minimize risk, these are the reasons why we think it's going to minimize, make your risk a little bit lower, or make your risk to other people a little bit smaller. I think what's tough now is to know that there's policy decisions being made, but we don't hear a whole lot about the evidence that they're being made with. I think that's what people find really confusing. I understand that they find it confusing because I find it a little bit confusing too.

Sheri Fink:

It's evidence and values, it's science plus values, I think when it comes to policy.

Roger Torda:

Well, listen, this is really fascinating, but I think we need to wrap up. Thank you, all of you. Thank you, Srikant. Thank you to all three of our panelists, Sheri Fink of the *New York Times*, Amy Maxmen of *Nature*, and author David Quammen. Thank you so much. You've been generous. Thank you for sharing some of your experiences with us. We'd like to thank our audience also, including those on Facebook Live. This brings us to a close. Thank you all for joining us.

Srikant Iyer:

Thank you.

David Quammen:

Bye-bye. Thank you.

Amy Maxmen:

All right, thanks.

Roger Torda:

Bye-bye, now.

Note: Minor edits have been made to the transcript for clarity.