

# Compassion, Empathy, and Trust in Science: An Immunologist's Take on How to Avoid the Next COVID-19

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It is January 13, 2020, the first day of the Spring 2020 semester, when a student stops by my office to ask if I'd heard about a new coronavirus in China. Having been occupied by start-of-the-semester business when the outbreak was first announced by the World Health Organization only 4 days earlier, I admittedly had not yet heard the news, though I vividly recall my understated response that "those things can be nasty." As an immunologist with training in microbiology and virology, I was aware of the original SARS coronavirus outbreak in 2003, which created quite the scare but was ultimately contained after killing 774 of its 8,098 victims. The topic occupied all of one PowerPoint slide in my microbiology class – with a near 10% mortality rate, the outbreak was indeed a crisis averted, though few of my students would have even heard of the virus 17 years later.

Fast forward one month, and I am giving what will become the first of many presentations on the "new coronavirus," this one as part of Hampden-Sydney College's Wilson Center Current Events Lecture Series. It is February 11, and the world has just surpassed 40,000 confirmed cases of the novel coronavirus, with a death toll approaching 1,000. The United States had reported its first documented case just over two weeks earlier and is only six days removed from its first reported COVID-related death. No one knew what was to come, but scientists, including me, were starting to get nervous.

I think back to this time and recall how little we all knew. When attempting to schedule the Wilson Center presentation around other activities on campus, I recall an organizer of the event saying that "we need to get this in now before it's all over." And I recall during the lecture that was held a week later that a co-presenter claimed, "Everyone just relax, we really should be more worried about the flu – that killed 22,000 people in the United States alone last year."

My colleagues will remain nameless, though I admit their comments could just as easily have come from me at the time. After all, we knew the original SARS outbreak was ultimately contained, and I'd spent years teaching my students just how serious seasonal influenza really is. Unfortunately, though, this outbreak was far from being "over," and this virus was not the flu – 22,000 deaths, a number certainly not to be minimized, would prove to be less than a week's death toll in the United States at the height of the COVID-19 pandemic. As I write this article, we are now just over 1 year and 2 weeks removed from our country's first reported COVID-19 death, and our death toll has now surpassed 500,000, accounting for over 20% of the nearly 2.5 million COVID-related deaths worldwide. Let me be clear – I never saw this coming. But I mentioned above that in February 2020 that I was getting nervous. I closed my February 11 Wilson Center lecture by stating, "We need to monitor this closely and be careful – this virus is highly infectious, and it likes to mutate."

I am often asked when I really knew things were bad. And the truth is that it was not some milestone statistic or scientific study that acted as that tipping point. As a former athlete and overall sports enthusiast, my “holy you-know-what” moment came on March 11, the day the National Basketball Association indefinitely suspended its season. The next day, which came to be known as “The Day The Sports World Stopped,” saw indefinite suspensions or delays for Major League Baseball, the National Hockey League, Major League Soccer, the PGA Tour, and my beloved NCAA March Madness Tournament. Everyone took notice, and within days colleges and universities across the country closed their campuses and moved to online instruction for at least the remainder of the semester. COVID-19 was here, and it was here in full force.

Even then, we were only beginning to see what would represent our first wave of the outbreak, and the virus scoffed at claims that it would just go away with warmer weather, bringing about an even larger second wave in the summer months. What was most scary to those in the know at this time, however, was that the virus *actually was* being limited by the high temperatures and humidity of the summer – this second wave *actually was* a blunted wave of infection by a virus battling to survive in less than ideal conditions. And of course predictions of what would follow under more ideal conditions for the virus in the coming fall and winter months only underestimated just how devastating the pandemic would become, with the third wave of the outbreak becoming a tsunami by comparison with the smaller swells of its first two waves.

Sadly, by the early spring of 2020, all of this was predicted, and while it was never going to be fully stopped, so much could have been prevented. And so of course the question that we all must wrestle with is: “What went wrong?” – a question that must be answered before we can even begin to address the equally important questions, “How do we end this pandemic?” and “How do we prevent another from happening in the future?”

As I consider these questions, I could begin to fill a book with scientific details that have emerged over the last year and that provide varying degrees of insight into the pathogenicity of the SARS-CoV-2 virus and pathology of COVID-19 disease. The virus and its related variants will be the focus of research careers for decades to come, and we will continue to learn so much in the years ahead. But there are two things that I believe this virus has already taught us, neither of which require a medical degree or a Ph.D. in virology to understand, that will ultimately shape our response to the next pandemic and that could have shaped a much different outcome for the current one:

1. ***As a society, we simply must achieve greater trust in science.*** Though I have said that no one saw this pandemic coming, that statement is true only to a certain point. Scientists had indeed been predicting an upcoming pandemic in recent years, and very early during the course of the SARS-CoV-2 pandemic it became apparent to epidemiologists, clinicians, and researchers alike that we were facing a serious public health problem. Science told us how infectious SARS-CoV-2 is at the onset of the outbreak. Science told us the ways in which

this virus is transmitted. Science told us that because the virus is transmissible before symptoms arise, testing would be critical to stopping its spread. And science told us that wearing masks and maintaining distance significantly limit virus transmission. Science also led to the development and approval of safe and effective vaccines within a year of the first documented case of the virus, an unprecedented achievement that speaks to not only our technological advancements but also to the sheer commitment and resolve of dedicated researchers and healthcare providers. Science *did not* tell us to shut down our economy; it instead told us how to open our economy safely. Science *did not* tell us to live in fear and isolation; rather, it told us to depend on each other more than ever to ensure the safety and health of all. In short, science rose to the challenge.

Unfortunately, we did not always listen to science, and to this day there remain some who are not listening. To those individuals, as well as future generations, I urge you to listen carefully to what science is telling us – it will help us end this pandemic, and it will go a long way to curbing the next one. And I acknowledge that a key part of trusting science is also understanding how science works, which is something we must do a better job of communicating to society in the years ahead and which is why institutions like Hampden-Sydney College that broadly educate its students are so critical to producing a scientifically-informed society. Indeed, science can be described as a study of the unknown, and it is therefore true that our understanding of SARS-CoV-2 has evolved, and will continue to evolve, over time. Such evolution of knowledge does not mean that science was ever wrong – it means only that our once-limited knowledge is becoming ever more complete with time, and with that refined understanding comes the need for new recommendations and guidelines that “follow the science” as it is unfolding. It has indeed been tragic to witness the political attack on science over the last year, and the distrust of science has contributed just as much, if not more than, the actual virus itself has to the magnitude of this pandemic. In this regard, outside of the loss of life that we have witnessed, I believe the politicization of science will one day be recognized as the greatest tragedy of this pandemic, and our greatest failure in the response to it. It never had to be this way, and science told us that long ago.

2. ***The SARS-CoV-2 coronavirus has challenged our society's compassion and empathy, and while it is unfair to say the virus has won, it is fair to say that we could have, and still must, do better for each other, both now and in the future.*** I can't begin to count the number of times over the past year that I've heard comments like, “The virus only causes the common cold in 99% of those it infects” or “I don't like masks and I don't have an underlying condition, so I'll take my chances.” Perhaps one of the biggest challenges in combatting this virus as a society stems from the fact that the first quote above is in many ways true – SARS-CoV-2 does cause the common cold in many patients. Of the COVID-19 cases that have been diagnosed to date, the mortality rate for this disease currently stands at 2.2%, and of course this statistic does not take into account the large number of asymptomatic cases that we know go undiagnosed, so it may be that the true mortality rate

for this disease is closer to 0.5-1.0%. Still, this number is not as small as it sounds, and it does not take into account the significant number of patients who are hospitalized with severe illness or who develop long-term complications from their disease. But the fact remains that many COVID-19 patients do just get the common cold, and this outcome has likely fueled a mindset of nonchalance in many. In this regard, had COVID-19 exhibited a higher mortality rate, perhaps we would have collectively taken the pandemic more seriously as a society (a drastic response is indeed partly what kept the original 2003 SARS outbreak, with a mortality rate near 10%, from spiraling out of control and ending with a death toll of less than 1,000). By comparison with the original SARS coronavirus, the mortality rate of SARS-CoV-2 is certainly miniscule. But due to the nature of the SARS-CoV-2 pandemic, it became apparent early on that rates and percentages needed to be thrown out the window – the virus was so prevalent and infectious, even before symptoms set in (a big contrast with the original SARS coronavirus), that even a *small percentage* of deaths was going to equal a *large number* of deaths. And the failure of many to recognize this basic principle and to consider the impact of their actions on others has contributed significantly to the spread of this virus to vulnerable populations, not all of whom can be recognized simply by their age, their weight, or their history of illness. The truth has always been that not a single one of us has ever been able to know for certain whether we've asymptotically carried the virus at some point during the pandemic, just as we have never known how those we interact with might respond to the virus should we transmit it to them. Going forward, therefore, it remains my hope that more do learn to recognize how our individual actions and response to the pandemic affect those around us, not just in our homes and workplaces but also in our communities, both near and far. It is also my hope that in the future we will be able to look back at the failures of our collective response to this pandemic and understand just how much we do depend on one another, not only for support during such a crisis but also as a means of overcoming such a crisis.

With these final two points in mind, I will close by saying that despite the challenges we have faced during this pandemic, I remain hopeful about our future. I am in awe of what science and medicine have been able to accomplish in the past year. Thanks in no small part to dedicated researchers, the knowledge we have gained about SARS-CoV-2 and COVID-19 in such a short period of time is unprecedented in the history of disease and has led to rapid breakthroughs in both treatment and prevention. Likewise, though we have lost so many, the unwavering commitment of doctors and nurses has also saved so many. They may not wear the flashy masks of our childhood superheroes, but I think it is safe to say that the true heroes of this pandemic are those masked healthcare providers who have been on the front lines treating patients since the first days of the pandemic. And while I've said that this virus has challenged our compassion and empathy, I have also been heartened by stories of strangers bringing food and other essentials to those with underlying health conditions, images of doctors and nurses scarred by N95 face masks while working an extra shift to care for COVID patients, and news of volunteers driving patients who otherwise lack transportation to and from vaccination clinics. It is these images of caring and humanity that I pray will be the

lasting images of this pandemic and that will guide future generations in the years ahead. There will be another pandemic, of this much I am sure, but whether that pandemic strikes in 10 years or 100 years, it is compassion, empathy, and trust in science that will get us through it.