

**Article:**

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Guest: Dr. Joe El-Khoury from Yale School of Medicine and Yale-New Haven Health.

Bob Barrett:

This is a podcast from *Clinical Chemistry*, sponsored by the Department of Laboratory Medicine at Boston Children's Hospital. I am Bob Barrett.

"Fake news!" That's a phrase which has certainly been in common parlance in the 21st Century, but the concept has its roots far back in history. The spreading of "fake news" and scientific misinformation was already such a significant problem in the early 17th Century that Francis Bacon wrote a treatise on it. When it comes to science, particularly in health-related areas, such misinformation can have a profound impact on individuals and society as a whole. Saltimbancos and snake oil salesmen have been with us for centuries, but the current COVID-19 pandemic has seen the emergence of a plethora of bad actors who have tried to capitalize on this situation by spreading misinformation and undermining science for political, financial or promotional reasons.

A Q&A feature appearing in the August 2022 issue of *Clinical Chemistry* examined Public Misinformation and Science Communication in Times of Public Health Crises. In this Q&A, five experts who are scientists, physicians, and/or journalists who are also leaders in scientific communication were invited to answer key questions on this topic. We are pleased to have one of the moderators of that Q&A feature in this podcast. Dr. Joe El-Khoury is Associate Professor of Laboratory Medicine and Director of the Clinical Chemistry Laboratory and Fellowship Program at Yale School of Medicine and Yale-New Haven Health. So, Dr. El-Khoury, the title of the article is "Public Misinformation and Science Communication in Times of Public Health Crisis." What inspired this Q&A piece and why do you think this is relevant to the audience of *Clinical Chemistry*?

Joe El-Khoury:

Hi, Bob. We've all witnessed how the last two years unfolded and can agree that over a million deaths from COVID in the United States was not the best outcome for us. As a scientist, it was encouraging for me to see how quickly we were able to develop effective vaccines, but was kind of surprised by how slow the public adoption for them was. And resistance was similar when it came to early masking mandates and now it

continues with boosters. So, I really wanted to understand what could we as scientists have done better to inform the public of the importance of these actions, and to help address any rampant misinformation that's spreading online about them. I think this is relevant to the audience of *Clinical Chemistry* because we're constantly creating scientific information of national relevance, be it testing for COVID or non-COVID things like the pending VALID Act for regulating laboratory-developed tests or our current need for financial support, for example, for national pediatric reference interval initiatives.

So, I think there's a lot of lessons here that can inform our future responses as scientists so we can improve how we share our information with our readers and the public. And of course, this is also relevant to the broader scientific community because we're similarly challenged in getting a significant part of our leadership and public to accept existential threats like climate change.

Bob Barrett: So, who are the experts involved in this Q&A and why were they specifically chosen to share their perspective on the topic?

Joe El-Khoury: We invited a group of the nation's leading scientists, physicians, and journalists, who also are leaders in science communication. We have Holden Thorp, who is Editor-in-Chief of the *Science* family of journals. We have Richard Tofel, who is former president of ProPublica and currently a visiting fellow of the Harvard T.H. Chan School of Public Health. We also have Joseph Ross, Professor of Medicine and Public Health at Yale University, Associate Research Editor at *BMJ*, and co-founder of *medRxiv*, a popular preprint server for the health sciences. We also have Apoorva Mandavilli, reporter on science and global health of the *New York Times*. And finally, we have Eric Topol, who is a professor and Executive Vice President at Scripps Research, but also a prolific tweeter on science and medicine with over 650,000 followers on Twitter.

Bob Barrett: Dr. El-Khoury, the article indicates that there are two camps on this issue. One, advocating for training scientists to become better communicators, while the other advocated for better communication between scientists and journalists so each can draw from their own expertise. What have we learned about the responsibilities of scientists in communicating science and discrediting misinformation spreading online?

Joe El-Khoury: Yes, I thought this would probably be the most divisive topic among this group. Interestingly, they still somewhat agreed that there is a need for us to work collaboratively. Some like Joe Ross firmly placed the responsibility of discrediting

misinformation on the online platforms themselves, like Twitter. Others, like Holden and Apoorva, advocated for scientists working with expert science communicators to get their message across. Interestingly, Apoorva also saw misinformation as a gap in knowledge and recommended that scientists work with reporters to create the articles to dispel these myths, while others like Eric Topol expressed concerns about the rate and the extent that misinformation spreads, and stated that our best shot at preventing its harm is for all of us to work together.

So, my take home from all of these perspectives is that as scientists, we really have a responsibility to at least share our work online on social platforms like Twitter in a language that is accessible to a broad audience. We have an even greater ethical obligation to do that when the message we have is of national interest and impinges on people's lives in a significant way. In those circumstances, it is more important to work with expert science communicators like journalists to make sure that our perspectives are simplified and shared broadly for maximum effect. Another helpful perspective here from Richard Tofel was, it's important for scientists to remember that decision-making may include more than just our science. So, we should not focus on trying to control the outcome. Just sharing our truth as widely as possible without overstating their significance to reach a desired effect is important.

Exaggerating results, as Apoorva warns, is what drives people away from science and into the hands of those who spread misinformation. Finally, those of us willing to take on the additional burden of dispelling myths online, and Eric Topol does that in a big way with his Twitter followers, should. But ultimately, there are also things that are outside of our control and we need to be active citizens to press our governments and these online platforms to better flag and prevent the spread of disinformation.

Bob Barrett: Well, since we are in a *Clinical Chemistry* podcast, what about the role of such ancillary features of traditional scientific journals to inform the public?

Joe El-Khoury: These are essential. Again, this goes back to simplifying our communication and creating different channels to reach as broad an audience as possible. Some people don't like to or simply don't have the time to read articles. So, short podcasts, like this one, they can listen to while driving or when they're on the treadmill, are essential. *Clinical Chemistry* also has a Twitter account with over 11,000 followers, which I'm the social media editor for and help manage. That account's purpose is to advertise our articles and make this information more accessible to general scientists and make the public aware of them as well.

We haven't gotten into making videos yet, but that's another area I'm experimenting with, and have developed my own YouTube channel called Clinical Chemistry with Joe El-Khoury, where I even go a step further and start infusing comedy into science, which is a big no-no in the past, just to make that information more accessible and entertaining. All of these features I think are essential to make our science more accessible to others. So, I would encourage scientists to be creative in the ways you share your content today. The opportunities are simply endless. So, don't be stuck in the old way of just publishing in a journal and giving talks. That audience is limited and will not be accessible to the public.

For that reason, I think journals are now tracking what we call Altmetric, which Eric Topol talks about in this Q&A. That metric keeps track of social media and news outlet engagement with your article. A high score means your article is popular with the public and that is another way that a scientist's work is being evaluated today.

Bob Barrett: Well, finally, Dr. El-Khoury, can you summarize what you believe to be the most important advice from each expert?

Joe El-Khoury: There were too many, but if I was to choose one from each, I would say it's these ones. So, from Holden Thorp, scientists need to emphasize that science is an honorably self-correcting process so that any statements given are a snapshot in time. In other words, don't be so definitive about your conclusions, and leave the door open for things changing based on new information that can come up later.

From Richard Tofel, he recommends taking advantage of Twitter threads to share your science. He says it can be a powerful way of communicating logical, factual argument, complete with appropriate caveats and qualifications. So, for those of you not on Twitter, sign up and get involved. Follow other leading scientists to learn how they use Twitter threads to explain their science and share it more broadly. From Joseph Ross, a follow-up on being involved with Twitter, if you're already on it, Joe says, to him, the key to effective social media communication is to remain open-minded and constructive. There is no reason to be rude or demeaning as we can all stand to learn from one another.

From Apoorva, who had quite a few, she recommends talking to non-scientists frequently and she says it's a great way to rid your communication of jargon, complicated words and concepts, and unnecessary caveats. Do not "bury the lede," as they say in journalism. And finally, from Eric Topol, on the small studies that people may be reluctant to cover or publicize, he thinks it would be great to always wait for definitive studies, but sometimes good things come in small

packages that provide helpful insights and deserve raising awareness.

So, share your science no matter how big or small. Every piece of evidence is important, but provide the caveat so the conclusions are not exaggerated or misinterpreted.

Bob Barrett:

Dr. Joe El-Khoury is Associate Professor of Laboratory Medicine and Director of the Clinical Chemistry Laboratory and Fellowship Program at Yale School of Medicine and Yale-New Haven Health. He's joined us in this podcast on public misinformation and science communication. A Q&A feature on that topic appears in the August 2022 issue of *Clinical Chemistry*. I am Bob Barrett. Thanks for listening.