



Mark A. Strand

Communicating Science to the Public during the COVID-19 Pandemic

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In the early stages of the COVID-19 pandemic in the United States, people were keen to receive information but overwhelmed by the volume of it. Furthermore, many were anxious and unable to feel confident in the reliability and the benefit of the information they were receiving. In response to a perceived need in the public, the author produced a series of fourteen Facebook Live videos to provide clear information about COVID-19, to guide people to appropriate behaviors, and to instill hope. These videos were viewed 12,229 times. A 12-item survey was sent via Facebook to viewers. Respondents (n=77) reported that the videos improved their knowledge, helped them understand a complex problem, and feel hope. This experience undergirds the importance of providing scientific, nonsensationalized, nonpoliticized information during a crisis. It also shows the equal importance of messages of justified hope during a time of fear.

Caused by the novel SARS-CoV-2 coronavirus, the COVID-19 pandemic has challenged scientists, public health professionals, and physicians around the world to simultaneously understand and mitigate the effects of the pandemic. As a public health problem, frequent messaging to the public about the severity of the pandemic, the risks to individuals and communities, measures individuals could take to minimize the risk of contracting the disease, and the prospects of suppressing the pandemic was required.¹ Unfortunately, this messaging was marked by miscommunication regarding the true threat of COVID-19 and mitigation measures required of the public, leading to public confusion.²

The contrast between the mixed messaging in the United States regarding COVID-19 that ensued, and the public's desire for reliable and nonpoliticized information could not be more stark. First, understanding of the transmissibility and virulence of the virus is something that can be determined only as the epidemic is unfolding, so it was impossible to avoid some mixed messages coming from the World Health

Organization and the U.S. Centers for Disease Control and Prevention (CDC).³ This meant that the scientific process by which questions like these are ordinarily answered was playing out in real time. Scientific activities typically happen out of the public eye, in laboratories and hospitals, but with COVID-19, the process was taking place in full public view, hastily disseminated through public media sources, with limited ability for the public to gauge the credibility of the individuals giving messages, or the accuracy of their message.⁴ The very process of doing science, by which prior paradigms are revised, corrected, or overthrown as more data comes available, is perhaps confusing to the lay public who expect scientific facts to be immutable.⁵ This meant that some things which were messaged early in the pandemic, were later reversed. For example, the message that the main route of transmission was through fomites (objects or materials which are likely

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Article

Communicating Science to the Public during the COVID-19 Pandemic

to carry infection) left on surfaces and not through an aerosolized virus, was later reversed; this increased concern for wearing face masks.⁶ In their haste to publish or promote new information about COVID-19, even well-meaning journalists contributed to the proliferation of misinformation, or reported inaccurate portrayals of correct information.⁷ Finally, that this pandemic was occurring during a presidential election year added to the tendency to politicize information about the COVID-19 pandemic.⁸

In contrast, what the public needed was reliable information about the emerging issues and concerns of the day, removed from the conflicts of interest introduced by politics or religious loyalties. This contrast created anxiety in the public, and uncertainty about whom to trust to provide reliable information to calm their fears and inform their decisions.⁹ During a pandemic, the governmental and public health authorities need to provide scientific messaging, and they need to have the courage to challenge sensationalized and nonfactual claims which might harm the public.¹⁰ It has been shown that susceptibility to misinformation even compromises people's compliance with public health guidance, including willingness to be vaccinated.¹¹ People needed accurate information, but many lacked fundamental health literacy to understand the details of scientific information; therefore, they needed individuals who were able to translate complex information into understandable and usable messages.¹² Basic epidemiological terms such as pandemic, case fatality ratio, reproductive number, contact tracing, and various mortality indicators became common parlance, but few people had the background knowledge to understand these concepts.

It was against this backdrop that the author began to produce and post short COVID live videos using Facebook Live during the early days of the 2020 COVID-19 pandemic. This was done in response to the fear and lack of information present among many people in the public. The author wanted to provide answers to the questions people had, educate them about epidemiology, and give them hope in the face of uncertainty. *The question was asked: What do people need most during a pandemic, and what is the best way to communicate public health messages during a pandemic?* It was anticipated that viewers would welcome having complex ideas explained in comprehensible ways, and thus experience the benefit that knowledge and hope bring to increasing one's

self-efficacy.¹³ The purpose of this article is to report on this experience. Self-reported needs among the public during a time of uncertainty and how to provide informational and emotional support to people under the circumstances of a global pandemic will be explained. Lessons learned about how to communicate public health information, and what information was needed, will be introduced, as well as ideas for a dispassionate way to mitigate misinformation and conspiracy theories.

Methods

Facebook Live Video Production

On March 13, 2020, President Trump declared an emergency for COVID-19 under Section 501(b) of the Stafford Act, pledging funding in response to it. On March 14, sensing the beginning of a long-term struggle with COVID-19, and being hit with many questions about COVID-19 from concerned friends and family members, the author created a 2:18 minute Facebook Live video, preparing viewers mentally for what was anticipated would become a personal and public health challenge on a global scale unlike anything they had experienced before. The author is a chronic disease epidemiologist who teaches an Essentials of Epidemiology course to Master of Public Health students at North Dakota State University. Seeing the positive response to the first video by his Facebook friends, the author decided to do a follow-up video the next day. Thus, in this spontaneous way, began the creation of a series of Facebook Live postings.

During a period of 43 days, from March 15 to April 26, 2020, fourteen videos were produced. The videos were on average 12:08 minutes in duration, with a range of 2:18 to 17:21 minutes. The presentations utilized Power Point to display from four to seven slides, including data, information, and images on topics of current interest. Many of the topics came in response to questions that individuals were posing to the author on Facebook or in other formats. Topics covered included basic epidemiological terms such as case fatality ratio, reproductive number, infectious disease transmission dynamics, pandemic, herd immunity, social distancing, contact tracing, time course case curves, flattening the curve, and mortality indicators; and important issues such as typical COVID-19 symptoms, expected number of deaths, hospital surge capacity, COVID-19 testing, comparison of COVID-19 with influenza, the

evidence for wearing face coverings, and comparing global mitigation strategies. Each of the videos ended with a message of hope. These messages of hope spoke to such issues as loss and grieving, confidence in science, the importance of tending to one's physical and mental health, the role of one's faith, and the importance of social support. The messages of Lent and Easter from the Christian tradition were also included.

These Facebook Live videos were posted publicly to the author's Facebook friends, of which there were 221. Therefore, initially the videos could be seen only by these 221 friends, but could be seen by others if any of those 221 friends chose to share them with their Facebook friends. This resulted in the Facebook Live videos being viewed on average 874 times per video, with a total of 12,229 views. This level of interest in the videos gave the author confidence that the public wanted current and factual information about COVID-19 from a source they could trust, and within a framework of hope and positive messaging. The presentations ended when the author decided that the content was becoming repetitious and the urgency for information was waning. The public, after 43 days, had moved through the phases of confusion, denial, and uncertainty and now were prepared to handle the ongoing pandemic informationally and emotionally. The last Facebook Live video was delivered on April 26, 2020, at which time the author invited viewers to complete a short survey about their attitudes toward COVID-19 and the government's mitigation measures, and their own self-perceived value of viewing the COVID-19 Facebook Live videos (appendix).

Survey Design

A 12-item survey with one additional open-ended question for personal comments was created (appendix). Eleven of the questions were ordinal variables, using a variety of Likert scales. These were measured by proportion of respondents for each response. One of the questions required respondents to rank five responses. This was measured using a weighted mean rank score, and a Friedman test was used to determine the statistical significance of differences observed. Four of the items in the survey were taken from one used by Michael Wolf et al.¹⁴ No demographic or personal information was collected from the respondents.

The survey items were entered into the online survey software Qualtrics. A link was generated, which was

then posted on Facebook, with a request to people to complete the survey, and to share the link with friends whom they had shared the videos with. The survey was open from April 26 to May 11, 2020. It is not known how many people received the link, so it is not possible to determine the response rate.

Data analysis was performed using SPSS Statistics v27 software. Descriptive statistics (mean with SD and proportions) were calculated for all characteristics and respondents. Associations between variables were analyzed using Spearman's rho correlation analysis for ordinal variables. Only values significant at the 0.05 level are reported in the results. The Friedman test was used to test significance of ranked items. The significance level was set at $\alpha=0.05$. No formal qualitative data analysis method was used to analyze the comments to the open-ended question. Representative comments were selected to be included in the results.

Results

Quantitative

Seventy-seven individuals responded to this survey. In response to the question "how serious of a public health threat do you think COVID-19 is or might become," respondents scored it a mean of 8.1 out of a possible 10 points (0=no threat, 10=very serious threat) (table 1). Half (50.7%) of respondents were somewhat to very "worried about getting COVID-19," 83.2% felt it was somewhat or very likely that "themselves or someone they knew would get sick from the COVID-19 that year," and 77.9% considered the risk of mortality from COVID-19 to be 1% or higher.

Associations among the variables surveyed were evaluated using correlation analysis. The more serious they reported COVID-19 to be, the more worried they were about contracting COVID-19 ($r=-0.358$), and the more likely they were to think themselves or someone they knew would get sick from COVID-19 ($r=-0.254$).

Many (84.5%) respondents agreed or strongly agreed that COVID-19 "is a complex problem that is difficult for people to understand" (fig. 1). That 50.7% were somewhat or very worried that they would contract COVID-19, coupled with 83.2% concerned that they or someone they knew is somewhat or very likely to contract COVID-19, and belief among 77.9% of respondents that more than 1% of infected

Article

Communicating Science to the Public during the COVID-19 Pandemic

Table 1. Attitudes toward COVID-19 and Government Mitigation Measures

| COVID-19 Awareness | Summary Value (n=77) |
|---|----------------------|
| Mean response (SD) to: Q 1. On a scale of 1 to 10, how serious of a public health threat do you think the COVID-19 is or might become? (0 no threat, 10 very serious threat) | 8.1 (2.0) |
| Q 2. How worried are you about getting the COVID-19 virus? | |
| Very worried | 6.5% |
| Somewhat worried | 44.2% |
| A little worried | 37.7% |
| Not worried at all | 11.7% |
| Q 3. How likely do you think it is that you or someone you know may get sick from the COVID-19 this year? | |
| Very likely | 49.4% |
| Somewhat likely | 33.8% |
| Not that likely | 15.6% |
| Not likely at all | 1.3% |
| Q 4. What percentage of people who get the COVID-19 do you think will die as a result? (1, 2, 3, 4) | |
| Less than 1% | 22.1% |
| 1-5% | 70.1% |
| 5-10% | 3.9% |
| More than 10% | 3.9% |
| Q 5. How confident are you that the government can control the COVID-19 outbreak? | |
| Very confident | 6.5% |
| Somewhat confident | 46.8% |
| Not very confident | 36.4% |
| Not confident at all | 10.4% |
| Q 6. In general, the government has done the right thing with implementation of social distancing practices. | |
| Strongly agree | 64.9% |
| Agree | 22.1% |
| Neutral | 2.6% |
| Disagree | 9.1% |
| Strongly disagree | 1.3% |
| Q 7. The economic impact of social distancing practices has been too devastating, so social distancing should have been left up to individuals to decide on their own. | |
| Strongly agree | 3.9% |
| Agree | 11.7% |
| Neutral | 7.8% |
| Disagree | 33.8% |
| Strongly disagree | 42.9% |
| Q 8. The COVID-19 epidemic is a complex problem that is difficult for people to understand. | |
| Strongly agree | 41.6% |
| Agree | 42.9% |
| Neutral | 2.6% |
| Disagree | 10.4% |
| Strongly disagree | 2.6% |

individuals would die, created a situation of high anxiety (table 1). Another aspect to the public’s anxiety was their perception of how well they were being protected against the worst risks of COVID-19 and their confidence in the mitigation strategies that were being used. Only 53.3% of respondents were somewhat or very confident “that the government could control the COVID-19 outbreak” (table 1). And yet, 87% agreed or strongly agreed that the government “had done the right thing with implementation of

social distancing practices,” and 76.7% disagreed or strongly disagreed that the “economic impact of social distancing practices had been too devastating” (fig. 1). Correlation showed that those supportive of the government’s actions were those who were more concerned about contracting COVID-19 ($r=0.231$), had more trust in the government ($r=0.448$), less concern about impact on the economy ($r=-0.314$), and found the Facebook Live videos to be helpful ($r=0.274$).

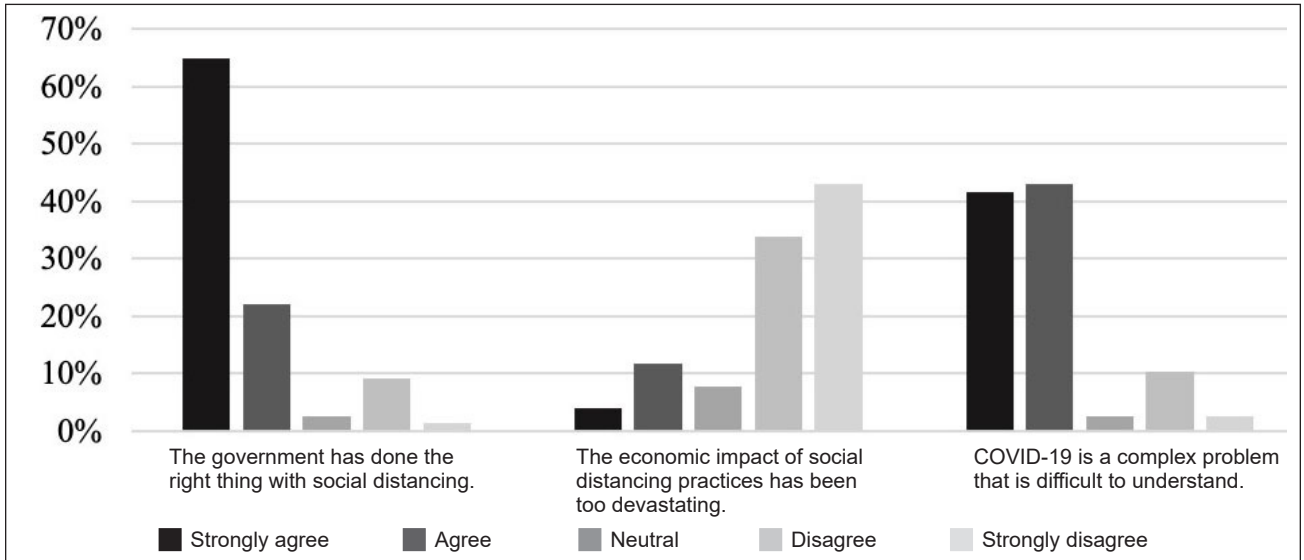


Figure 1. Comparing Attitudes toward COVID-19 and Government Mitigation Measures

Table 2. Perceived Value of Viewing the COVID-19 Facebook Videos

| Value of COVID-19 Facebook Live Videos | Summary Value (n=76) |
|---|----------------------|
| Q 9. COVID-19 Facebook Live videos were helpful in understanding a complex problem. | |
| Strongly agree | 88.2% |
| Agree | 10.5% |
| Neutral | 1.3% |
| Disagree | 0% |
| Strongly disagree | 0% |
| Q 10. Prior to watching the COVID-19 Facebook Live videos, my understanding of epidemiology was | |
| Extremely knowledgeable | 0% |
| Moderately knowledgeable | 15.8% |
| Somewhat knowledgeable | 31.6% |
| Slightly knowledgeable | 40.8% |
| Not at all knowledgeable | 11.8% |
| Q 11. Since watching the COVID-19 Facebook Live videos, my understanding of epidemiology is | |
| Much improved | 47.4% |
| Somewhat improved | 42.1% |
| About the same | 10.5% |
| Somewhat worse | 0% |

Article

Communicating Science to the Public during the COVID-19 Pandemic

Only 15.6% of respondents agreed or strongly agreed that the “economic impact of social distancing practices had been too devastating.” These individuals had some common characteristics, including they were less persuaded of the seriousness of the COVID-19 pandemic ($r=0.416$), not worried about getting COVID-19 ($r=-0.264$), and not supportive of the government’s actions ($r=-0.314$).

Respondents were surveyed about their knowledge of epidemiology (the science of counting disease in populations) prior to watching the videos (table 2). Only 15.8% of respondents reported their “understanding of epidemiology prior to watching the videos” to be extremely or moderately knowledgeable, with 72.4% reporting themselves to be somewhat or slightly knowledgeable (table 2). Despite, or perhaps because of, their limited prior knowledge about epidemiology, 98.7% agreed or strongly agreed that the videos were “helpful in understanding a complex problem” (table 2). Furthermore, 89.5% reported their “understanding of epidemiology” to be much or somewhat improved after watching the videos. Those reporting their understanding of epidemiology to have improved were those who believed the COVID-19 pandemic to be more serious ($r=-0.374$) and that they or someone they knew might get infected ($r=0.206$).

Those who found the Facebook Live videos most helpful were those who agreed that the government had done the right thing with the implementation of social distancing practices ($r=0.274$). When asked what it was about the videos that was most beneficial (table 3), respondents ranked them from most to least beneficial: “Scientific information explained in plain language,” “Inspirational messages of hope,” “Answers to questions I had about COVID-19,” “Dispelling rumors and fears about COVID-19,” and “Equipping me to face the epidemic with confidence,” with p-values of significance between each

of these five topics in sequence of 0.014, 0.200, 0.000, and 0.316, respectively.

Qualitative Results

The final item of the survey invited respondents to leave any comments they thought might be helpful. Below are the general themes and a representative sampling of the comments that were submitted.

Provided needed information in an honest and objective manner

I have a public health background and found the messages very informative and encouraging.

Some very helpful ways of explaining the epidemiology in plain language were very helpful for dealing with enquiries (I am a healthcare worker).

I loved your videos! I wish the mainstream news could give straight facts like you as well as give faith messages like that as well!!

Provided facts in a calm manner without sensationalism and politicalization

Great job! Thanks so much for sharing your knowledge and insight. It is so helpful to have facts without exaggeration.

Thank you. So much information on COVID-19 has a political slant. My gut tells me you are being objective. I have serious underlying health conditions that cause a general apprehension.

The videos were awesome and very helpful! I loved your calm demeanor! I also appreciated how you stated facts and didn’t involve politics.

Thanks for posting your videos. They are a calming voice of reason in a strange time.

Instilled hope

Deeply appreciated honest, unbiased information with no political agenda. Also appreciated mixing scientific information with messages of faith and hope.

Table 3. Ranking the Benefits Gained from the COVID-19 Facebook Live Videos

| Q 12. Benefits gained from viewing the Facebook Live videos. | Mean rank score with 1-highest and 5-lowest rank* |
|--|---|
| Scientific information explained in plain language | 2.2 |
| Inspirational messages of hope | 2.9 |
| Answers to questions I had about COVID-19 | 3.2 |
| Dispelling rumors and fears about COVID-19 | 3.2 |
| Equipping me to face the epidemic with confidence | 3.5 |

*Friedman X^2 statistic is 27.98 (4, $n = 77$), $p=0.000$.

I am a high-risk individual who is the primary caregiver of my elderly parent. I also am challenged at times by anxiety related to germs and illness. These videos have given me peace during this time. He has provided a logical, honest, yet hope-filled message which is helping me be rational and set aside the anxiety. Thank you!!

Discussion

Psychological Perceptions

The COVID-19 pandemic has challenged all Americans to cope with a complex and threatening viral outbreak. This challenge to coping with a pandemic has been complicated by inundation with COVID-19 reporting through the national media and social media. As was hypothesized, this study has shown that during a pandemic, people most value reliable scientific information provided in a timely way. The importance of hope was also demonstrated, leading to the conclusion that reliable information coupled with hopefulness increases one's self-efficacy to cope with the exigencies of a pandemic. While the level of analysis used in this study does not allow for a definitive conclusion, it has shown that the best way to communicate those public health messages is in a calm and nonpolitical manner. This information needs to come from a reliable source that is able to explain complex scientific ideas in a comprehensible way and instill hope.

Respondents in this study considered COVID-19 at the time of data collection to be very serious. The more seriously they took COVID-19, the more worried they were that they and their loved ones were likely to contract COVID-19 disease. The combination of high perceived severity and high perceived susceptibility is a recipe for fear and anxiety.¹⁵ Such anxiety is best dealt with by clear transparent messages about the issue rather than vague or sensationalized pronouncements. Furthermore, the majority of individuals considered COVID-19 to be a complex problem that was difficult for people to understand. This may explain why the viewers who were more concerned about the seriousness of COVID-19 found the Facebook Live videos more helpful. This aligns with other research that has shown that the best predictor of positive behavior change with COVID-19 was that the person was concerned about the severity and susceptibility of COVID-19.¹⁶ However, the way this concern is addressed needs to be factual and calm, rather than dramatic or fear-heightening.

The majority of respondents in this study were worried about themselves or someone they knew becoming ill with COVID-19. Patients with chronic diseases (n=630) surveyed in a clinic, using some of the same survey items as were used in the present study, reported significantly more worry that they would get COVID-19 than people without a chronic disease.¹⁷ That is to say, individuals with a disease, putting them at higher risk of a bad outcome if they get COVID-19, are more worried about getting it.

With high levels of fear, individuals may not think clearly and rationally when reacting to COVID-19.¹⁸ Therefore, when one is inclined to respond with rational arguments or forced to get people to respond appropriately, it will likely only exacerbate the person's fear, and potentially make their behavior even more erratic or noncompliant. A calm, reassuring, nonpoliticized response will better calm their fears and put them in a better frame of mind from which to respond rationally.¹⁹

Political and Government Action

The creation of fear for political purposes during a pandemic is nefarious.²⁰ During the COVID-19 pandemic, politically liberal elements have been accused of hyping the pandemic to make the current administration look bad, and conservative elements have been accused of ignoring scientific authorities in order to minimize damage to the current administration's reelection chances. Many people are victimized by these actions because their response to the pandemic is then driven by politics, rather than scientific evidence. Respondents to this study also reported on the importance of the nonpoliticization of the videos. A study using an international community found that the only predictor of positive behavior change (e.g., social distancing, improved hand hygiene) was fear of COVID-19 itself, with no effect of varying political ideologies. Therefore, messaging should focus primarily on calming people's fears, with less concern about profiling people politically in the messaging.²¹

This project was conducted within the context of a society that was experiencing significant distrust in the government, and in authorities in general, at the time of the pandemic.²² And responses among respondents to the present survey were split evenly regarding whether the government would be able to control the outbreak. Uncertainty about its ability to control the outbreak reflected either concern

Article

Communicating Science to the Public during the COVID-19 Pandemic

that the government simply was not able to stop the pandemic, or suspicion about the government's integrity and commitment to stop it. The survey would suggest the former; that is, concern about the government's inability to stop the pandemic, not its unwillingness to do what it takes to stop it. This was shown through high levels of belief that the government had done the right thing in implementing social distancing practices.

Those supportive of the government's actions were those who were more concerned about contracting COVID-19, had more trust in the government, less concern about impact on the economy, and found the videos to be more helpful. This study had no data regarding the respondents' responses prior to seeing the videos. So, one can only surmise that their trust that the government was doing the right thing, even if they were not sure whether it would be effective, was influenced by the objective and nonpolitical approach used in the videos. The messages of hope offered at the end of each video also contributed to a perceived benefit by the viewers.

Skepticism about social distancing was found among 10.4% of the respondents. This group of people had some characteristics in common. They were those who were less persuaded of the seriousness of the COVID-19 pandemic, not worried about contracting COVID-19, did not support the government's actions, and were less likely to report the Facebook videos to be helpful. Kaiser Family Foundation polling conducted April 15–20, 2020, approximately the same time as the survey reported here, found 19% of the American people to say that shelter-in-place measures were excessive.²³ This is close to the 10.4% of respondents to the present survey who reported skepticism about social distancing requirements. The source of one's information appears to be associated with attitudes toward COVID-19 mitigation as well. It was reported that Canadians who regularly consume social media were less likely to observe social distancing and less likely to perceive COVID-19 as a threat, while the opposite was found to be true for people who receive their information from official news sources.²⁴

Belief in misinformation about COVID-19 is associated with lower trust in science and scientists.²⁵ The American Scientific Affiliation, which is the parent organization of this journal *Perspectives on Science and Christian Faith*, is well positioned to increase trust in science in society. One of the ways to increase the

dissemination of accurate information and reduce the digging in on one's own position that often comes with debating, is through what has been called "cognitive inoculation."²⁶ This approach front-loads the public with accurate scientific information in a non-inflammatory way so that when they meet with conspiracy theories or other forms of misinformation they have some degree of "immunity" against it, and are more inclined to be critical of such conspiracy theories.²⁷ This shows the importance of scientists communicating science to the public consistently in order to provide a steady rational guard against misinformation.

Video Effect

Respondents were overwhelmingly in agreement that the videos were helpful and that they added to their meager understanding of epidemiology prior to viewing the videos. Those who valued the Facebook Live videos also tended to agree that the government had done the right thing with implementation of social distancing practices. In contrast, those people who were not as concerned about the pandemic, and were less supportive of the government's role, were also less interested in learning, as defined by not having found the videos very helpful. Unfortunately, there was no pre-video data to determine whether the videos changed people's opinions about these things.

Faith Community

When asked what it was about the videos that was most beneficial, respondents ranked "Scientific information explained in plain language" the highest and "Inspirational messages of hope" the second highest. A pandemic creates confusion and fear. A trustworthy source of factual and nonsensationalized, nonpoliticized information is important. This is an invaluable lesson for public health in terms of public messaging. One needs to provide objective, nonsensationalized information in a timely fashion, addressing the current questions people have. But it also needs to speak to the emotional reactions people have. There are lessons here for the faith community. Clergy seldom have the scientific knowledge sufficient to speak to their members about science-related issues that might be affecting their well-being. However, they have the trust of their members and are looked to for help with their emotional and spiritual needs. This is an opportunity for faith leaders to call upon members of their church who have the appropriate expertise to provide teaching and

counsel to their members.²⁸ This leads to a few final thoughts about the importance of communicating science-related information to members of the faith community.

The challenge of introducing science to a lay audience is both a theoretical issue and a communications issue. The theoretical question concerns how one views the relationship between science and scientific evidence and faith. In his seminal work, Ian Barbour described the relationship between religion and science in four different ways: conflict, independence, dialogue, and integration.²⁹ The approach used in these Facebook videos was in line with Barbour's dialogue category. With the dialogue approach, the results of science are taken seriously on their own terms, but the implications for one's faith experience are also considered in dialogue with that science. In the study reported here, the results of epidemiology research stand on their own, but they are also considered using a faith lens. For example, most churches built their COVID-19 response on state-level public health guidelines, but they also took into consideration the spiritual needs of their congregations. So, decisions of science and faith were made in dialogue, not in isolation. Dialogue is not easy, because all parties need to be flexible and find common ground. This was what the author was striving to do in presenting epidemiological findings within the context of the viewers' personal experience with the COVID-19 pandemic. The communications question involves finding a method of communicating science to a lay audience, to which attention will now turn.

Communicating challenging scientific ideas to a lay audience requires critical thinking and persuasive arguments, but it is most effective when done in a nonconfrontational manner.³⁰ The viewers clearly appreciated that these videos contained facts, and not politics, and were delivered in a calm manner. This approach to communicating scientific topics to Christian audiences has been well developed by others. Author Greg Cootsona has demonstrated Barbour's dialogue approach in his book *Mere Science and Christian Faith*.³¹ Cootsona explains how to understand and communicate complex ideas that lie at the interface of faith and science, covering topics as diverse as neuroscience and climate change and beyond. His curious, and even humorous, approach to difficult questions is a counter to an absolutist approach that some would use to claim biblical domination over scientific ideas. Another author, Andrew Root, has used the experience of a fictional

youth pastor to demonstrate how humility toward science and humility toward faith prevent one from overstating the authority of either.³² These are good ground rules for dialogue and create the kind of amicable atmosphere conducive to listening, learning, and idea formation.³³ These approaches serve as models of what the author was striving to accomplish in this Facebook Live video series.

Readers of *Perspectives on Science and Christian Faith* are well positioned to apply the principles advocated for in this article. Most of them have some degree of mastery in a scientific field, and participate within a faith community whose members are in need of understanding science through the lens of faith. While translating complex scientific ideas to the lay level is not easy, it is an important step in being a servant to the faith community. Learning how to communicate that scientific information in a way that is not overly technical or sensationalized is worth the effort. It is a better way to heighten lay persons' appreciation for the importance of science than through argumentation. And, of course, participating regularly in a fellowship of scientists who share one's faith perspective can improve one's ability to accomplish this goal.

On a recent day, the author was jogging on a local trail, when the rider of an oncoming bike called out in passing, "Thank you for your Facebook videos, they were great." Not recognizing the rider, the author called back as he rode past, "Can we chat?" The rider introduced himself as a member of the author's church, and went on to say,

Your Facebook videos were fantastic. They gave me the information I needed to understand the pandemic and gave me hope. I was able to share them with my parents-in-law to help them overcome their confusion and to accept the seriousness of the pandemic. And I was able to use the information at my workplace to put in place needed safety measures. I can't thank you enough.

This chance encounter summed up and made personal what was reported by the survey respondents in this study. It also illustrated the opportunity that those trained in science have, as they communicate science to the faith community in ways that inspire and inform.

Conclusion

This study has shown that, during an infectious disease pandemic, people highly value scientific

Article

Communicating Science to the Public during the COVID-19 Pandemic

information which is credible and nonsensationalized and provided in a timely manner. In addition, people want something which speaks to their emotional and social needs as well as to their need for scientific information. This was seen through the importance that respondents placed on inspirational messages of hope, that these should be included with the provision of scientific information. This is now a “scientific world,”³⁴ and the need for all persons to be able to understand and respond appropriately to scientific information is increasing. Therefore, the call upon people of faith, who are scientists, engineers, and healthcare professionals, to support the lay public with factual and clear communication of science-related issues of significance, cannot be overstated.

This study has several limitations. As a cross-sectional study, the absence of respondent information prior to the COVID-19 pandemic or prior to viewing the videos, eliminated the possibility of determining change in perceptions or attitudes among respondents. Second, responses may have reflected individual personality or current convictions more than the effect of the videos. Thus, the study results do not allow one to determine what the impact of the pandemic or viewing the videos had on their position. However, two of the eleven Likert questions required respondents to compare their change after watching the videos. So respondents served as their own control. This is inferior to having a true control group, but it does reduce bias somewhat. Third, there was a limit to which inferential statistical tests

could be performed in the absence of respondent demographic or personal information. Finally, it is possible that those who chose to respond were not a representative sample of all viewers. Respondents may have been those sympathetic to the views of the Facebook Live video presenter, so nonresponse bias cannot be ruled out. Therefore, the generalizability of the results is limited to the author’s Facebook viewers, but the generalizability of the importance of and methods of communicating science to persons of faith is widely applicable.

This study has raised additional questions that merit further reflection and future studies. Although respondents valued the information and hope they received, what do they actually do with that information? Does it increase their willingness to accept mitigation measures and adopt behavioral practices that will protect them, such as social distancing and mask wearing? Or is it simply a short-term emotional consolation? This study has underlined the importance of providing scientific, nonsensationalized, nonpoliticized information during a crisis, but in the main, how much scientific and health information do people of faith expect from, or desire from, their faith community? Do people prefer to live in a world where these two domains are kept separate? It is the author’s hope that researchers will provide answers to these questions with innovative research efforts, and that readers will take up the challenge to serve as voices of reason in their spheres of influence, during the COVID-19 pandemic, and beyond. ⇔

APPENDIX

Survey

During 2019, the COVID epidemic emerged, creating uncertainty and disruption. In response to a perceived need for information about COVID-19, Mark Strand created a series of short videos posted on Facebook to address this need. This survey is for the purpose of evaluating your experience with these videos and with the epidemic in general. Your participation and candid responses are appreciated.

Q1. On a scale of 1 to 10, how serious of a public health threat do you think the COVID-19 is or might become?

No threat at all Very serious public health threat

0 1 2 3 4 5 6 7 8 9 10

Q2. How worried are you about getting the COVID-19?

- Very worried
- Somewhat worried
- A little worried
- Not worried at all

Q3. How likely do you think it is that you or someone you know may get sick from the COVID-19 this year?

- Very likely
- Somewhat likely
- Not that likely
- Not likely at all

Q4. What percentage of people who get the COVID-19 do you think will die as a result?

- Less than 1%
- 1-5%
- 5-10%
- More than 10%

Q5. How confident are you that the government can control the COVID-19 outbreak?

- Very confident
- Somewhat confident
- Not very confident
- Not confident at all

The next items make a statement. Select your level of agreement with these general statements.

Q6. In general, the government has done the right thing with implementation of social distancing practices.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

Q7. The economic impact of social distancing practices has been too devastating, so social distancing should have been left up to individuals to decide on their own.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

Q8. The COVID-19 epidemic is a complex problem that is difficult for people to understand.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

Article

Communicating Science to the Public during the COVID-19 Pandemic

Q9. Mark Strand’s COVID-19 Facebook videos were helpful in understanding a complex problem.

- Strongly agree
- Somewhat agree
- Neither agree nor disagree
- Somewhat disagree
- Strongly disagree

Q10. Prior to watching Mark Strand’s COVID-19 Facebook videos, my understanding of epidemiology was

- Extremely knowledgeable
- Moderately knowledgeable
- Somewhat knowledgeable
- Slightly knowledgeable
- Not at all knowledgeable

Q11. Since watching Mark Strand’s COVID-19 Facebook videos, my understanding of epidemiology is

- Much improved
- Somewhat improved
- About the same
- Somewhat worse

Q12. Rank the benefits you gained from Mark Strand’s Facebook videos. Rank the selections from 1=most benefit to 5=least benefit.

| | 1 | 2 | 3 | 4 | 5 |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Scientific information explained in plain language | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Inspirational messages of hope | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Answers to questions I had about COVID-19 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Dispelling rumors and fears about COVID-19 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Equipping me to face the epidemic with confidence | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

Thank you for your willingness to respond to these questions. The responses will be used to educate public health students about the role of educating the public during a health crisis. Feel free to leave any comments you think might be helpful.

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