National Priorities to Combat Misinformation and Disinformation for COVID-19 and Future Public Health Threats: A Call for a National Strategy

March 2021

JOHNS HOPKINS
BLOOMBERG SCHOOL
of PUBLIC HEALTH

Center for
Health Security

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Acknowledgments

Executive Summary

The COVID-19 pandemic has shown that health-related misinformation and disinformation can dangerously undermine the response to a public health crisis. Contradictory messaging and active subversion have reduced trust in public health responders, increased belief in false medical cures, and politicized public health measures aimed at curbing transmission of the disease. Setbacks in the COVID-19 response have highlighted that health-related misinformation or disinformation can lead to more infections, deaths, disruption, and disorganization of the effort. The public health response and communication environment in the United States have been disrupted by significant distrust in government, exacerbated by confusing and conflicting messages from leaders. As a result, information voids have developed, easily filled by false or misleading information and directly targeted by perpetrators of disinformation. Taken together, the spread and consequence of public health misinformation and disinformation can lead to a range of outcomes that have national security implications and require effective response.

Unfortunately, there are no easy solutions to the problem of health-related misinformation and disinformation. No US agency is tasked with leading a unified response, constitutional concerns with free speech limit some potential interventions, and solutions require cooperation across a range of stakeholders. It is time for the United States to address the problem of health misinformation and disinformation through a national strategy to ensure an effective response to the COVID-19 pandemic and to prepare for the challenges of future public health emergencies. The National Security Council should be responsible for developing and overseeing a US strategy for preventing and responding to health-related misinformation and disinformation in public health emergencies, drawing on existing federal agency efforts, expertise, and implementation capabilities. Given the damage already done by misinformation and disinformation, there is an urgent national security and public health need to ensure effective management of public health misinformation and disinformation by increasing accessibility of correct information and reducing the reach of false information through a combination of efforts.

The development of a national strategy to prevent and respond to COVID-19 and future public health misinformation and disinformation is an important first step in the establishment of a solution set to this threat. The priorities that should guide the development of a national strategy are:

Pillar 1: | Intervene against false and damaging content as well as the sources propagating it

- Establish a multiagency national security response effort that prioritizes management of public health disinformation, from both domestic and international sources, as a national security issue in order to prevent disinformation campaigns and educate the public on their use.

- Establish a national nonpartisan commission that provides neutral evidence-based guidance and recommendations in order to improve the health communication landscape in ways that limit misleading information and ensure accountability for and identification of sources of misleading information.

- Encourage active, transparent, nonpartisan intervention from social media and news media companies to identify and remove, control the spread of, and curtail generators of false information.

Pillar 2: ### Promote and ensure the abundant presence and dissemination of factual information

- Prioritize public health risk communication at the federal, state, and local levels in public health departments and academic research communities by including training and resources on specific messaging and by increasing staffing, funding, and research support.

- Increase coordination between public health experts and sources of public information, including social media platforms and news media to increase the dissemination of accurate information through multiple channels.

Pillar 3: ### Increase the public's resilience to misinformation and disinformation

- Safeguard and promote health and digital literacy through multiple sources including schools, community organizations, social media, news media, and others to help information consumers choose responsible sources of information and increase their awareness of disinformation tactics and approaches.

- Improve resources for public verification of questionable content through the development of a robust fact-checking infrastructure with support, training, and guiding principles for fact-checking organizations.

Pillar 4: ### Ensure a whole-of-nation response through multisector and multiagency collaboration

- Ensure multisector collaboration in the development of a national strategy to combat public health misinformation through collective planning with social media, news media, government, national security officials, public health officials, scientists, the public, and others.

- Increase coordination across the range of government stakeholders and conduct a cross-governmental analysis of efforts and responsibilities for managing health-related misinformation and disinformation in order to streamline and organize efforts. Key US agencies include the Department of Defense, Department of Health and Human Services, and Department of Homeland Security as well as intelligence agencies such as the Federal Bureau of Investigation, the National Security Agency, and the Central Intelligence Agency.

Introduction

A critical lesson from the COVID-19 pandemic is the dangerous influence of health-related misinformation and disinformation. False information, intentional or not, has had a myriad of effects in the past year, including reduced trust in public health responders, increased belief in false medical cures, and politicization of public health measures. The spread of these falsehoods has led to more infections, deaths, disruption, and disorganization of the effort to combat the pandemic.[1,2] Confusing and conflicting messages from leaders also increased distrust and disrupted the public health communication environment, with the resulting information voids providing ripe opportunities for the spread of false information.

Both domestic and international actors have used false information during this public health emergency to further their own political and societal goals.[3,4] The threat of COVID-19 disinformation is noted in the Worldwide Threat Assessment by the Director of National Intelligence and the Homeland Threat Assessment by the US Department of Homeland Security (DHS).[5,6] Taken together, the spread and consequence of public health misinformation and disinformation can lead to a range of outcomes that have national security implications and require effective response. The United States must address the problem of health-related misinformation and disinformation through a national strategy, both to ensure an effective response to the COVID-19 pandemic and to prepare for the challenges of future public health emergencies.

The Problem

Health-related misinformation and disinformation are messages that contradict the best expert evidence available at the time and can lead to false perceptions or "factual beliefs that are false or contradict the best available evidence in public domain."[7,8] False information may be misinformation (inadvertent spread of erroneous information) or disinformation (deliberately created and propagated false or misleading information). Often, health-related events such as the COVID-19 pandemic can serve as a vehicle for the pursuit of financial, political, and social goals through the use of false information.[9,10] Health-related misinformation and disinformation can include, but are not limited to, mischaracterization of the disease or protective measures that are needed, false treatments or medical interventions, scapegoating of groups of people, and conspiracy theories, which are often focused on the existence or origin of the pathogen, profiteering, or politics.[3] Misinformation and disinformation of all these types have spread rapidly and can be traced to private citizens, government leadership, and foreign entities.[11,12]

The emergence of new communication platforms and access-enabling technology, such as social media and mobile phones, that connect networks of people who often share similar opinions and cultural beliefs has exacerbated and amplified this problem.[13,14] Furthermore, traditional news media has, in many instances, been transformed, often with limited incentive for impartial delivery of unbiased information.[15-17] Information

sources, both emerging and traditional, amplify each other and may create echo chambers with little opportunity for the introduction of divergent ideas.

The spread of misinformation and disinformation on social media platforms during the COVID-19 pandemic has been on a large scale, and at a rate impossible to counter in real time through official channels.[18,19] In February 2020, the World Health Organization (WHO) characterized the overwhelming amount of COVID-19 information—both true and untrue—as an "infodemic, which undermines public health measures and leads to unnecessary loss of life."[20,21] The oversaturation of information during the pandemic allowed for confusion and misinformation to be spread among the public, who may struggle to differentiate what is true and false.[22] Lack of coordination at the federal level, healthcare professionals speaking outside of their expertise, and delayed responses to misinformation through official communication channels also aided the spread of false information.[22-24] However, major efforts have been made since WHO declared a COVID-19 infodemic, including the release of a research agenda for managing infodemics.[25] These recommendations reflect similar agendas across a spectrum of professional groups.[26-28]

During the current COVID-19 pandemic, as well as past outbreaks, misinformation has hindered public health response efforts and contributed to an increase in fear and social discord in the population.[29] Previous epidemics have demonstrated that health misinformation occurs across a range of settings and contexts. Ebola-related misinformation amid conflict in the Democratic Republic of the Congo in recent years has contributed to violence in the region, led to attacks on medical personnel, and hindered the ability for healthcare workers and community health workers to help affected populations.[30,31] During a small outbreak of Ebola in the United States in 2014, misinformation about the disease intersected with content that was highly politicized and seemingly designed to promote discord amongst readers, posing challenges for risk communication and evidence-based decision making.[13] Misinformation and disinformation can commonly be found in a subtle mix of half-truths, misrepresented truths, and opinion, making identifying and addressing such content particularly challenging, especially if the provider is a trusted community leader.

If you see false information online

- Don't repeat or retweet the lie, even with a correction
- If you don't know the source or the source is not legitimate, limit direct engagement
- Report it to social media companies
- Provide true information

Disinformation campaigns related to health emergencies are not a new phenomenon. Well-documented efforts by the KGB, the secret police force for the former Soviet Union, to frame the HIV pandemic as the result of US government experiments to develop biological weapons were largely effective in many parts of the world.[32] In 2018, researchers published findings demonstrating that Russian troll activity on Twitter between 2014 and 2017 was used to weaponize content about vaccines to fuel political and social discord in the United States.[10] While disinformation campaigns may have specific goals to move opinion and alter specific actions taken by the public, recent research has shown that social discord is a goal unto itself, including actions that have been ongoing during the COVID-19 pandemic.[33] Groups within the United States may also seek to use disinformation campaigns to further anti-vaccine or other political goals.[34] The United States is uniquely vulnerable to online disinformation due to its large advertising market, weak public service media, and fragmented news consumption by the public.[35] Growing levels of political polarization and diminishing levels of trust in expertise and authority have been exacerbated by social isolation due to COVID-19, creating a communication environment ripe for exploitation via social media.

The broader problem of the spread of false or misleading information, and influence campaigns in particular, has been widely recognized in both government, private industry, and public forums. The US Department of Defense (DOD) and the US Department of State (DOS) have increased efforts to combat foreign propaganda and disinformation campaigns.[36] Importantly, public health misinformation and disinformation is also an area of interest for domestic actors.[4] Furthermore, public health communicators are a critical part of an effective response in management of false health information. A broader approach that integrates these wide-ranging perspectives is needed. Fortunately, the public health sphere may be one of the most tractable areas in which to address and find solutions to the problem of the spread of misinformation and disinformation because it is, in some cases, easier to distinguish scientifically valid health information from false or misleading information and to identify clearly harmful outcomes.

Many current recommendations focus on education and "inoculation" against misinformation, more accountability on the part of social media platforms in identifying and controlling the misinformation messages, interagency and international cooperation in managing misinformation, and use of machine learning/artificial intelligence to help identify and flag misinformation and disinformation in real time.[19,23,37-39] In response to misinformation and disinformation that has spread via traditional news media, private groups have begun efforts to deter advertising with news organizations that are perpetuating misinformation.[40,41] Policy recommendations and legislative bills have been developed in an attempt to fight misinformation and disinformation.[42,43] Many reports and guidelines from international organizations and domestic think tanks include a range of advice—from how social media companies can curtail spread to how individuals can identify and respond to misinformation and what responsibilities that various stakeholders could take on.[44-46] However, these efforts are

generally reactive in nature. Proactive guidance for an overarching national strategy that takes into account the various sectors of stakeholders involved has been limited.

Social Media Efforts

The call for accountability by social media platforms has begun to be addressed, with policies and partnerships being created in an attempt to stop misinformation before it can reach a larger audience and to elevate and amplify official content from verified sources.[47,48] For example, Twitter's COVID-19 misinformation policy is centered on not allowing users to spread COVID-19-related information that may cause harm.[49] A violation of this policy results in the tweet being deleted or labeled with additional context or in permanent suspension of a user's account. Facebook's policy focuses on disrupting misinformation by making it more difficult (although not impossible) for users who are posting misinformation to buy ad space, using machine learning to screen for fraudulent claims, and efforts to detect fake accounts to prevent spamming misinformation at a large scale.[50] Facebook-owned companies—Facebook, Facebook Messenger, Instagram, and WhatsApp—have similar COVID-19 misinformation policies to Twitter's, including removing posts that could result in harm, labelling claims that do not result in physical harm (conspiracy theories such as the 5G origin of the virus), and reducing the reach and distribution of posts containing misinformation not resulting in harm to reduce the potential impact.[51] Facebook has also created the Oversight Board to review content removal.[52] The WhatsApp and Facebook Messenger misinformation policies center on preventing the spread of viral messages by limiting the number of times a message can be forwarded, labeling forwarded messages, and using machine learning to recognize and remove accounts that are sending out mass messages.[51] Google-owned YouTube's medical misinformation strategy does not allow information contradictory to that of local health authorities or WHO on topics such as treatment methods, the existence of COVID-19, prevention techniques, diagnostic methods, pathogen transmission, and nonpharmaceutical interventions.[53] YouTube uses a strike system, so if a channel posts a video that violates those guidelines, the video will be removed and gain a strike on their account; after 3 strikes the individual's channel will be banned.[53] Google's counter-misinformation work is centered on disrupting ads and other content that could harm consumers by using deceptive practices such as misleading representation, clickbait ads, unreliable claims, and manipulating media to fit a narrative.[54] If an ad or extension being submitted to Google violates one of the policies, it will be disapproved and not allowed to launch until it is fixed or the business/individual's account can be suspended without warning.[55] In one of the earliest efforts to combat false information about vaccines, Pinterest began limiting and breaking the search function for vaccine-related information on the platform, offering instead a message to contact a health professional regarding any questions and messages from leading health authorities such as WHO.[56] Pinterest has continued their anti-misinformation policy by removing any health-related misinformation or attempting to limit the spread and reach of these messages on their platform.[57,58] Despite these important individual efforts, a collaborative effort by key stakeholders is needed to develop and implement a national strategy.

Key Stakeholders Critical to Successful Misinformation and Disinformation Management

Addressing the problem of misinformation and disinformation during public health emergencies requires the involvement of a number of different stakeholders. Technological solutions alone are not sufficient to prevent the spread of misinformation and disinformation. Reducing the propagation of false information, increasing the spread to true information, and improving the resilience of those who consume information requires joint efforts amongst all relevant stakeholders. Efforts by only one or a few will allow false information to continue to spread and impact the management of the public health emergency. Stakeholders include:

Social media platform owners and operators

Social media platform owners and operators need to improve access to science-based information and do more to control false content. These platforms should coordinate more with health communicators to help improve the reach of public health communication. Partnerships between social media platforms and trusted information sources, including WHO, were established in 2020 to combat COVID-19 misinformation;[59] however, more assessments should be done to determine the success of these partnerships and ways to optimize these efforts for future health emergencies.

News media organizations and journalists

The news media has a critical role to play in promoting important true information about disease outbreaks as well as correcting false information. In some cases, this may include providing public health messages, pushing back on false rumors, and limiting sensationalist or highly politicized content. However, the news media has also at times played a role in the dissemination of false rumors. Trust in news media has declined and few measures are in place to ensure accountability in the communication landscape.[60] Closer partnerships with public health officials and researchers may make news media efforts to promote accurate information and reduce the spread of misinformation and disinformation more likely.

Government

Governments across the world have increasingly implemented measures to combat political-, social-, or health-related misinformation and disinformation.[61] Such measures include using task forces to assess the misinformation and disinformation problem in national populations, implementing media literacy campaigns, developing fact-checking government run websites, passing legislation punishing perpetrators for spreading false information, and instituting national or international government- or police-led surveillance of reported alleged misinformation or disinformation.[62] Multiple stakeholders within the US government have important roles in management of misinformation and disinformation.

Policymakers

Legislation and funding allocations can be used to establish misinformation and disinformation management infrastructure, and input from multidisciplinary external stakeholders is important in shaping these efforts. However, little guidance has been provided in the design and ethical implementation of government measures to manage misinformation and disinformation, particularly with respect to how to balance implementation of anti-misinformation actions while balancing civil rights, including freedom of expression. Additionally, there is a lack of evidence indicating what measures work and how frequently or under what circumstances these measures are being used. Careful consideration should be taken to ensure preventative measures and potential regulatory approaches appropriately balance the need to protect the health and wellbeing of a population by reducing health misinformation while balancing the rights of individuals to express themselves. Effective implementation of policies also will rely on breaking down the traditional silos between health and security government stakeholders.

National security organizations

The US intelligence community—which includes the Central Intelligence Agency, National Security Agency, Federal Bureau of Investigation, DOS, and DHS as members—recognizes misinformation and disinformation as threats to national security, particularly when used in influence operations orchestrated in conjunction with cyber operations. The DOS has initiatives underway to assert US national security interests

regarding this issue and is actively working with partners to understand lessons learned from the effects of cyber-enabled influence campaigns, particularly those by the Russian state. In Europe, these campaigns potentially influenced Scotland's near secession from the United Kingdom in 2014 as well as the Brexit referendum.[63-65] As such, the US intelligence community is accelerating efforts to understand the systems that make influence operations successful, so that interventions can be developed. Solutions beyond a government-led whole-of-nation approach could include partnerships or cooperative relationships with social media platforms formed in the interest of preventing, detecting, and interdicting bots and botnets (fake internet personae that are commonly used to manipulate the presence of messages on social media on a large scale, increasing the likelihood of certain messages being seen); developing increased means of attribution in terms of influence operation perpetrators; and sharing information about observations made about threat actors across the information environment so that entities across all sectors can inform their practices.

Public health agencies and institutions

The spread of misinformation and disinformation during the COVID-19 pandemic and other disease outbreaks has shown that many standard public health messages do not resonate with hard-to-reach populations such as minorities and politically polarized or culturally isolated communities. Often, these communities are the most affected by an infectious disease outbreak. Public health agencies and public health-focused institutions need to explore new message formats and themes to ensure that public health information is more accessible and resonates with key audiences that are often missed or ignored.

Scientists and public health researchers

Scientists and researchers must work to communicate scientific findings effectively and to engage in research that can translate to more impactful communication practices that provide accessible and accurate information to the public.[66] However, during the COVID-19 response, the use of preprint servers to make access to scientific findings rapidly available has led to the promotion of this nonpeer-reviewed research as fact in the press, which has occasionally led to confusion and mistrust amongst the public. Additionally, the public health research community must develop mechanisms to debate policy questions and dissenting opinions without these disagreements being politicized.[67]

Members of the public and consumers of information

In addition to the previously mentioned stakeholders, interventions should also be developed to better educate members of the public on how to evaluate their information consumption. Educational programs and advertising campaigns to improve the ability to responsibly review information for potential bias and limitations are critical, as is a sense of responsibility to vet information for truth before spreading it to others. Increasing digital literacy across all age groups and social or political identities is important and requires partnerships with community organizations and advocacy groups, such as the American Association of Retired Persons.[68] Importantly, efforts to increase public resilience to false and misleading information should be tailored to fit the needs of the target audience, such that key messages are culturally competent and compelling to diverse values and beliefs.

Each of these key stakeholder groups needs to be engaged and contribute to the development of a national strategy to combat health misinformation and disinformation.

Priorities for a National Strategy

The COVID-19 pandemic has demonstrated the need for a national strategy to combat health-related misinformation and disinformation. Policymakers should act now, while the threat is clear and before conditions worsen, to create such a strategy. This will require a broad approach organized by 4 principles or conceptual pillars: (1) intervene against false and damaging content as well as the sources propagating it, (2) promote and ensure the abundant presence and dissemination of factual information, (3) increase the public's resilience to misinformation and disinformation, and (4) ensure a whole-of-nation response through multisector and multiagency collaboration.

Pillar 1: Intervene against false and damaging content as well as the sources propagating it

Establish a multiagency national security response effort that prioritizes management of disinformation

The COVID-19 pandemic has highlighted the national security importance of managing health events. In particular, health-related disinformation and misinformation can have significant implications for national security and should be a priority of the national security apparatus. Both the Worldwide Threat Assessment, completed by the

Director of National Intelligence, and the Homeland Threat Assessment, completed by DHS, have noted the threat of influence and disinformation campaigns, including in the context of COVID-19.[5,6] The National Security Council should be responsible for developing and overseeing the US strategy for preventing and responding to the management of health-related misinformation and disinformation in public health emergencies, drawing on the expertise, implementation capabilities, and existing efforts of the Department of Health and Human Services, DOD, DHS, DOS, and the US intelligence community.[36,69]

The public should also be made aware of information campaigns aimed at the United States. The DOD, DOS, and intelligence agencies monitoring this information space should coordinate more closely with the press and other communication partners, including social media platform companies to expose information threats and increase public vigilance against these efforts. Federal public health agencies such as the US Centers for Disease Control and Prevention should also collaborate with these agencies to assess specific public health-focused rumors so that they can tailor public health messaging in the context of purposefully disruptive rumors and share this information with state and local public health communicators. Although only a portion of false information is generated by foreign adversaries and some programs are already in place to identify information campaigns, a more multidisciplinary and publicly accessible identification of the methods, campaigns, and tactics being used by purveyors of false information would help to educate the public about disinformation campaigns being used against them during health emergencies and, thus, improve management of false information during health events.[36]

The national security response should also acknowledge the importance of homegrown health-related misinformation and disinformation. Similar to international sources, domestic sources of health disinformation should be flagged by social media and public reporting mechanisms, assessed for harms by health experts, and potentially deplatformed to mitigate the spread of false information. Particular attention should be paid to groups normally unrelated to the public health space, that may seek to use health emergencies to further spread false information that benefits their financial, political, or societal goals. Coordination between government and social media companies may be needed to monitor newly emerging platforms as they grow.

Establish a national commission that provides neutral, evidence-based guidance and recommendations in order to improve the health communication landscape

Effective management of health-related misinformation and disinformation would benefit from the establishment of a neutral, nonpartisan, and expert authority in the health communication landscape. Standardized frameworks and parameters are needed to define health misinformation and disinformation in practical terms that distinguish misleading statements that are potentially harmful to health or society from statements that are simply incorrect. Determination of how to characterize and mitigate

the different types of misinformation or disinformation, including in various languages and targeted at specific populations, will likely require input and collaboration from interdisciplinary experts. An effective national strategy to combat health-related misinformation and disinformation should include the establishment of a standing nonpartisan cross-disciplinary expert commission—including social media companies, communication specialists, public health experts, and bioethicists—to propose standards. Such a commission could define and distinguish strongly misleading information; determine key characteristics of misinformation and disinformation that would warrant intervention, including categories of harm; and outline possible processes and measures to implement in managing infodemics.

Currently, there is a lack of consensus and understanding on how to best control infodemics while also respecting freedom of speech and avoiding abuses of power from authorities. Actions should aim to align with principles and guidance outlined by international stakeholders, including the United Nations and WHO.[70-72] A cross-disciplinary committee to propose standards should include efforts to build transparent infodemic monitoring infrastructure and to complete a review of practices and gaps in identification and management of false information, including current practices of social media, US government, and relevant international organizations (eg, WHO).

Finally, neutral oversight efforts should include the formulation of transparent, responsible documentation of misinformation and disinformation management. The US government should establish a public-facing resource (eg, database or webpage) that provides information about what strategies have been implemented to manage infodemic and what types of content or influence operations have been targeted through intervention. Resources should be designed to demonstrate clear transparency on what, how, and why certain misinformation or disinformation was considered damaging, but in ways that minimize the spread or amplification of that content. Establishing the parameters and principles guiding this effort will enable stakeholder groups to provide oversight in ways that remain as objective and transparent as possible. Additionally, reaching consensus on which stakeholders should be involved and their roles will also be important in the set up of this work.

Encourage active, transparent, nonpartisan intervention from online social media and news sources

Digital platforms have the capability to intervene in meaningful ways against the transmission of misinformation and disinformation, including reducing the activity of bad actors. For example, in response to the riots in Washington DC, on January 6, 2021, Twitter, Facebook, and other platforms banned specific users who acted in ways that encouraged violence and illegal activities.[73,74] Similar, though less severe, corrective actions have also recently been implemented by platforms to address health misinformation. For example, Facebook has recently expanded its practices and policies to more extensively manage vaccine misinformation circulating on the platform by increasing availability of correct information and removing anti-vaccination

misinformation or disinformation.[75,76] While banned or removed content may be able to find other outlets to remain active, these recent events demonstrate the impact of interventions across a broad range of digital resources and highlight the potential power of corrective action by platforms. In the context of health misinformation and disinformation during emergencies, multifaceted, proactive prevention efforts by social media companies and news media organizations are needed in order to address false information before such content contributes to a crisis requiring reactive intervention.

While expanded and proactive intervention is needed, the power of concerted efforts by technology companies highlights the need for the establishment of careful, transparent approaches and guides for ethical, objective implementation by digital platforms and services. Rather than leaving sole responsibility for decisions about intervention to technology companies during public health emergencies, guidance for the implementation of interventions should be developed by the interdisciplinary nonpartisan commission mentioned previously to formulate categories of harms and triggers for gradually escalating interventions by social media companies. This approach may also be helpful in the realm of traditional media as well.

2 Pillar 2: Promote and ensure the abundant presence and dissemination of factual information

Prioritize public health risk communication

Public health risk communication is an essential component of any health emergency response, yet often it is not prioritized appropriately. Staffing and funding should be increased for multilingual public health risk communication as well as misinformation and disinformation management efforts in federal, state, and local public health departments. Investments in funding and staffing innovative and cutting-edge communication approaches in public health departments would be helpful in competing in a rapidly changing communication environment. This newly skilled workforce would have capabilities in big data analysis, information management, and public health. These investments should include policies that prioritize rapid communication clearance chains to limit information voids that can be filled with false information. More public health officials and scientists who have public-facing positions or may be called on to provide public comment could benefit from annual or semiannual training in tested and scientifically validated approaches to public health risk communication.

At the same time, communication with the public has taken on aspects that are beyond the capacity of public health officials. Rapidly available funding to establish advertising campaigns during public health emergencies to help increase dissemination and volume of accurate information are needed. For instance, the Ad Council has recently launched a $50 million campaign to increase uptake of the vaccine. Public health ad

campaigns similar to this have been successful before.[77] The $55 million Tips from Former Smokers campaign generated about 1.64 million new quit attempts and was considered cost effective.[78] Efforts ahead of public health emergencies are needed to understand the types of public health messages that resonate with various segments of the population.

Given the current political and social divisiveness that exists in the country, a notable proportion of the population may have limited trust in official government sources and may seek information from more trusted community partners, such as religious leaders, medical care providers, or local community organizers. While the federal government should work to depoliticize health-related messaging, it should also seek to develop additional avenues to provide information to the public through trusted messengers. It is critical, however, that these messages be accurate and scientifically sound since the loss of trust or impression of political "spin" in such a circumstance could harm public health for decades.

If you need to respond to people who believe false information

- Engage respectfully
- Connect along common values
- Talk about tactics and how misinformation draws you in
- Discuss alternative explanations
- Encourage verification
- Provide alternative sources
- Provide true information

Increase coordination between public health experts and sources of public information, including social media platforms and news media

Although difficult in the midst of a response, public health communicators and institutional communication teams should prioritize engagement with news media to increase the reach of public health messaging and to assist them in pushing back on false information. This is especially important for reaching new audiences, that may be more skeptical of public health interventions, through local news and conservative news sources. A national strategy should also include potential areas of partnership and ways that government and public health agencies can aid digital platforms and news media sources in the promotion of science-based information.[79] Public health messaging should be reflected across news and social media. However, in a 24-hour news cycle, this may require more rapid availability of experts than many government public health agencies currently allow for. Additionally, efforts should focus on continuing to build and finetune practices on responsible science reporting in media, with accountability measures for the spread of false information. For example, public health and news media stakeholders could convene to establish guidelines and best practices on how to report on possible misinformation or fact-checking misinformation.[80-82]

3 Pillar 3: Increase the public's resilience to misinformation and disinformation

Safeguard and promote health and digital literacy

Efforts should also be made to enhance digital literacy amongst the American population.[45,83,84] Research has shown that when warned about tactics and methods in the spread of disinformation, members of the public are more resilient against false information due to awareness about commonly used approaches.[85-87] Ideological values, political affiliations, and other aspects of identity can play a substantial role in a person's exposure to information as well as their willingness to believe or reject misinformation.[88] A national strategy should outline avenues for the establishment of programs from a range of sources, including news media, schools, communities, and social media, to help improve public understanding of how to discern trustworthy information sources, detect hallmarks of disinformation, and find accurate resources. Similarly, improved health literacy and understanding of public health-related issues, such as vaccines, could help to mitigate the impacts of some health-related misinformation and disinformation as more members of the public understand the lack of scientific basis for certain claims. Promotion of digital and health literacy is a cross-generational education issue, which requires consideration across all age ranges, particularly as some research found that older adults share disinformation substantially more frequently than young adults.[83,89,90] Intervention focused exclusively on the school-aged population will be inadequate.

Ways to check for false information

- Use web-based tools and services that can provide unbiased assessment of source credibility[91]

- Verify information with other news sources, trusted people in your network, or cross-referencing with the best information available

- Ensure that the source is known, credible, and trusted by taking a close look at the social media account, web URL, or layout that might suggest lack of editorial oversight

- Think twice about messages that seem designed to appeal to emotions[92,93]

- Increase awareness of disinformation campaign tactics and personal biases that influence judgment of sources and information, as well as one's capacity to change opinion when presented with new evidence[94]

Improve resources for public verification of questionable content

Members of the public are often told to verify information that may seem questionable, yet many may have difficulty identifying trusted sources to fact-check messages. In many cases people exposed to false information may not trust government websites as a verification source and may require nongovernmental resources to help them judge content. Additional resources are needed to support fact-checking websites, especially considering that efforts to correct false information and inform populations about the threat of disinformation can vary in approach and efficacy.[95] Traditional approaches to addressing misinformation generally have focused on countering with factually correct statements. This approach can come with some challenges, particularly during a pandemic of an emerging pathogen, when the correct information may still be unknown or unclear. Such types of content have sometimes been referred to as "midinformation" because of the inherent ambiguity of emerging information.[83] Additionally, some efforts assessing the effects of posting some type of warning above false content have found such notifications modestly beneficial, particularly when the warning specifically said the content was "false" rather than "disputed."[85] However, other research has indicated that such labeling may not be effective or could backfire.[96] An important component of these efforts is a robust fact-checking infrastructure. Organizations such as the International Fact-Checking Network have worked to develop this industry, provide training resources, and establish guiding principles for fact-checking globally.[97-100] Public health authorities and researchers should work with fact-checking organizations to support their efforts in clarifying and disseminating correct information.

4 Pillar 4: Ensure a whole-of-nation response through multisector and multiagency collaboration

Ensure multisector collaboration in development of a national strategy to combat public health misinformation and disinformation

The response to COVID-19 misinformation and disinformation cannot be effective if only a few stakeholders make efforts to control it. Instead, a meaningful approach to this problem requires multisector collaboration toward the development of a national strategy to combat public health misinformation. An effective national strategy will incorporate expertise and ensure collective support from a range of stakeholders from the government, academic, and private sectors. These include digital platform owners, news media, public health practitioners, and education experts. Collective action is a requirement to achieve meaningful success. Technical skills, resources, and ability to respond and manage false information exist across the government, commercial, and academic spaces.

Additional research is needed via collaboration between government, communication practitioners, and academia to explore new and emerging solutions in a rapidly evolving space and to expand a nascent field of scientific understanding.[25,46] Research is needed to understand aspects and components of misinformation and disinformation and its impacts on the public. In addition, more research is needed on the practice of managing misinformation and disinformation in order to provide more answers on how to prevent harmful health-related misinformation and disinformation from propagating, prepare for when it occurs so, and respond effectively to ensure that interventions can make measurable differences in controlling false information related to health issues.

Increase coordination across the range of government stakeholders and conduct a cross-governmental analysis of efforts and responsibilities in order to streamline and organize efforts

A broad range of government agencies actively respond to health-related misinformation and disinformation while some address other types. An effective approach to managing health-related misinformation and disinformation should incorporate and ensure broad government cooperation, including from the White House, National Security Council, Department of Health and Human Services, DOD, DHS, DOS, and the US intelligence community. A cross-governmental effort will identify and incorporate the disparate stakeholders and interests spanning the many roles, policies, plans, and requirements across federal agencies and the private sector.[101] It should include formal process for review and assessment, as well as provisions for input from officials at a range of government levels. Although the strategy would be developed at the national level, many interventions will need to be planned and implemented at the state and local levels. As such, input from state and local implementers would be helpful. A crucial component of government stakeholder involvement is a shared understanding of the importance of providing factually correct information and managing harmful misinformation or disinformation. To be successful, a national strategy must be aligned to principles and actions that ensure government stakeholders and leadership share this goal.

Conclusions

To meet the threat of health-related misinformation and disinformation for the COVID-19 pandemic and future public health emergencies, the United States needs to create a national strategy to establish a more unified, multisectoral, and organized approach than has thus far been developed. Such as strategy should be organized around 4 main pillars of effort: (1) intervene against false and damaging content as well as the sources propagating it, (2) promote and ensure the abundant presence and dissemination of factual information, (3) increase the public's resilience to misinformation and disinformation, and (4) ensure a whole-of-nation response through multisector and multiagency collaboration. Solutions require shared responsibility from a range of actors, including, but not limited to, social media, news media, government, national security officials, public health officials, scientists, and the public. All stakeholders will need to work together to balance constitutional freedoms, social media platform responsibility, the value of free-flowing information, and the dangers presented by misinformation and disinformation. A national commission should be established to provide evidence-based guidelines and recommendations for nonpartisan oversight of this area.

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