Exhibit 204

COVID-19 Vaccination Communication: applying behavioral and social science to address vaccine hesitancy and foster vaccine confidence. https://asprtracie.hhs.gov/technical-resources/resource/9850/covid-19-vaccination-communication-applying-behavioral-and-social-science-to-address-vaccine-hesitancy-and-foster-vaccine-confidence

COVID-19 Vaccination* Communication:

Applying Behavioral and Social Science to Address Vaccine Hesitancy and Foster Vaccine Confidence**

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* Although technically these are SARS-CoV-2 vaccines, we refer to them as COVID-19 vaccines to be consistent with how most lay people describe them.

** The content of this paper is based on what was known as of December 2020 regarding COVID-19 vaccines. Recommendations from this report may need to be adapted as new information becomes available.

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Executive Summary

Although newly developed COVID-19 vaccines are poised to be a powerful tool in the control of the devastating COVID-19 pandemic, the public's confidence in and willingness to receive the vaccines will determine the outcome of this mass-scale public health intervention. This report, which was developed in consultation with leading experts in social and behavioral sciences and public health, outlines **evidence-informed communication strategies in support of national COVID-19 vaccine distribution efforts** across federal agencies and their state and local partners. The recommendations put forth are actionable and responsive to the unique challenges faced by the United States in responding to the COVID-19 pandemic. The report relies on a few foundational practices of effective health communication, namely **coordinated communication and consistent messaging, trust building through partnerships, consideration of different health literacy levels** in the population, and importantly, **prioritizing equity** in all aspects of communication. We build on these foundational principles to outline three intersecting considerations for communication efforts (*What* is being communicated, *Who* is the target of the message, and *How* the message is communicated), along with concrete recommendations for targeted and tailored communication that responds to the needs and perspectives of the intended audience.

WHAT

Define the goals of vaccination communication

Identification of specific communication goals is necessary to inform the development of message content and format. In addition to provision of top-line information regarding the vaccines, it is important to consider and address underlying reasons for vaccine hesitancy to instill trust. Doing so in an empathic way is crucial to avoid alienating those who have concerns about the development and deployment of these vaccines. Monitoring the spread of both general and COVID-19-specific vaccine misinformation, and taking steps to mitigate its impact, will be critical for successfully addressing vaccine hesitancy. It is important that the goals of communication efforts—whether they focus on the delivery of top-line messages or on addressing vaccine hesitancy and misinformation—continue to evolve in response to emerging pandemic- and vaccine-related information and shifts in public sentiment to sustainably reinforce vaccine confidence.

WHO

Identify the needs and perspectives of the intended audience

The COVID-19 pandemic is having a disproportionate impact on communities already experiencing health and social disadvantages by virtue of their race, ethnicity, health status, age, access to health care, occupation, and socioeconomic conditions. To develop the most effective, trustworthy, and equitable communication strategies, the perspectives of the intended audience—including concerns, motivations, values, and information needs—must be considered. These factors should dictate vaccination communication priorities, including understanding and responding to different reasons for vaccine hesitancy in diverse communities. This document highlights some of the unique challenges and factors associated with vaccine hesitancy in specific communities and describes methods that may help increase vaccine confidence in these populations.

HOW

Create and disseminate messages tailored to the intended audience

Given the diversity of factors that drive vaccine hesitancy in different groups, communication efforts cannot take a "one size fits all" approach. Effective communication goes beyond the provision of accurate content; it must also be tailored to the community's values and priorities and come from trusted messengers. The only way to truly "listen" to the community is to co-develop and co-disseminate COVID-19 vaccination messages through meaningful partnerships with trusted information sources. In addition to partnering with trusted entities and leaders during message development, certain communication tactics may prove effective across a variety of communication campaigns. For example, it may be helpful to frame COVID-19 vaccination as a social norm that is collectively beneficial and acceptable and to reinforce the idea that vaccination is an apolitical, nonpartisan health care decision. Promotional materials, such as "I got the shot" stickers, may help establish vaccination as a socially supported behavior and enhance vaccine confidence by making vaccination behavior more visible.

Furthermore, modifying the choice architecture in ways that make vaccination the easy and convenient action (for example, by asking people to opt out of rather than opt into vaccination at health care appointments) could increase the likelihood of vaccination uptake, while still preserving autonomy in decision making. However, efforts to promote the vaccines must also take care to ensure that all messages are accurate, transparent, and truthful and neither exaggerate nor minimize the vaccine benefits or risks. Similarly, overactivation of fear and overly directive message framing should be avoided, because these approaches are likely to be counterproductive and heighten vaccine hesitancy. Ensuring value-concordant messaging and eliciting positive emotions, whenever possible, will enhance trustworthiness and increase the impact of the message. Finally, several creative communication strategies, such as the use of personal narratives (e.g., from celebrity spokespeople) and short videos (e.g., "edutainment"), may help effectively convey key messages in an accessible way.

Introduction

The historic public health crisis resulting from the SARS-CoV-2 (hereafter COVID-19) pandemic has resulted in tremendous mortality and morbidity, as well as unprecedented economic loss and disruption to daily life in the United States and across the world. Long-term control of the COVID-19 pandemic hinges on the development, distribution, and uptake of vaccines. Although highly effective COVID-19 vaccines have been developed rapidly and a phased plan for national vaccine distribution has been established, ensuring the success of national vaccination efforts will require a communication plan to address vaccine hesitancy and foster vaccine confidence. To enhance acceptance and trust in COVID-19 vaccines among the diverse populations in the United States, communication activities should be informed by insights from behavioral and social sciences and continuously adapt to a complex and dynamic vaccination landscape across all phases of vaccine distribution and administration.

Despite the considerable suffering and disruption caused by the COVID-19 pandemic, polls suggest that a sizable proportion of the U.S. population either does not plan to receive a COVID-19 vaccine or is unsure about receiving a vaccine.[1,2] Furthermore, a recent report found that despite the disproportionate impact the pandemic is having on minority communities in the United States, only 48 percent of Black Americans and 66 percent of Latinx individuals surveyed would receive the vaccine even if it was available for free.[3] The hesitancy observed regarding COVID-19 vaccines is, in many ways, understandable given the novelty of the virus, mixed messages about the severity of the disease, concerns about the rapid vaccine development timeline, and perceived politicization of the process.[4] These COVID-19-specific concerns may be exacerbated by factors that reduce vaccine confidence in general, including distrust in traditional sources of health information (e.g., government agencies, scientists, the medical system), the rapid and extensive spread of misinformation online, and disinformation campaigns that take advantage of the divisive public discourse around vaccines.[3,5,6]

In addition to vaccine hesitancy, the fact that most candidate vaccines require a two-dose regimen administered several weeks apart[7] creates additional challenges for full vaccine uptake. Communication efforts will need to make it clear that individuals will not only need to initiate the vaccine, but also to return to receive another shot at the right time to be fully vaccinated. In addition to logistical complexities, the two-dose regimen could add to communication challenges if individuals experience unpleasant side effects in response to the first dose, making them reluctant to complete the series.[8,9] Experience with other multiple-dose vaccines, like the shingles vaccine, suggests that educational efforts that highlight the efficacy of the vaccine and set appropriate expectations about any initial side effects will be crucial to overcoming this barrier.[8,9]

It is clear that public health entities charged with communicating about COVID-19 vaccines face notable challenges, including a compressed timeline for developing communication strategies to educate the public about the vaccine and address vaccine hesitancy ahead of rollout. Moreover, vaccination communication must be connected to the broader context of COVID-19 pandemic control, including critical preventive behaviors, such as mask wearing, hand washing, and social distancing. Consequently, the rapid, coordinated dissemination of effective messages will be an essential element in addressing one of the most significant public health challenges in decades. Although ensuring successful vaccine uptake across the nation will require addressing demanding logistical and structural challenges, strategic and evidence-informed communication regarding vaccine safety, efficacy, distribution, and access will also play a key role in the complex national COVID-19 vaccination process. Drawing on behavioral and social science research, in addition to establishing collaborative partnerships with trusted community organizations, can increase the likelihood that COVID-19 vaccine communication endeavors will be successful.

To identify evidence-informed strategies for communicating about COVID-19 vaccines, the NIH [Behavioral and Social Sciences Research Coordinating Committee](#) formed a COVID-19 vaccine communication working group in September 2020 and convened an expert panel on November 5, 2020. The panel, which comprised 15 leading experts in public health and social sciences (e.g., communication, psychology, behavioral economics, health disparities, anthropology), focused on identifying evidence-informed communication approaches that could guide government entities in communicating COVID-19 vaccine-related information to a variety of constituents. The panel also made recommendations about how these communication strategies could be optimized, tailored, targeted, and delivered to address the unique needs and perspectives of diverse populations. The panel discussion formed the basis of this report, which is designed to summarize evidence from behavioral and social science to inform COVID-19 vaccine communication efforts across U.S. federal agencies and partners at the state and local levels. This report begins by outlining foundational considerations for any public health communication effort and then delves into more specific evidence-informed communication strategies for reducing hesitancy and enhancing confidence in COVID-19 vaccination.

Foundational Communication Considerations

Effective health communication relies on foundational best practices. Although these are not the primary focus of this report, some of the COVID-19 vaccine communication recommendations highlighted in subsequent sections will build on these general best practices:

- **Ensure coordinated communication and consistent messaging:** Although a national strategy is important, sustained partnerships with state, local, and community organizations are critical, because most communication ultimately must be locally implemented and coordinated. Message framing may differ depending on the specific community of focus, but it is important to minimize conflicting or distracting messages by keeping message content as consistent as possible.

- **Foster transparency and build trust through partnerships:** Presenting clear and accurate information that does not exaggrate or minimize the benefits or potential risks is vital. In addition, leveraging trusted sources to disseminate the messages is as essential as the content itself, and it can be accomplished through sustainable partnerships between federal agencies and trusted entities or individuals who reflect the diversity and views of the intended audience.

- **Consider the range of health literacy:** Plain language and visual representations should be used where possible. Additionally, communication strategies should be developed to accommodate different levels of health literacy (e.g., the capacity to understand health information), digital literacy (e.g., the capacity to discern the credibility of online sources), and science literacy (e.g., understanding of the evolving nature of science). Furthermore, language preferences for those with limited English proficiency must also be taken into account. It is important that translations into other languages be done in a culturally sensitive way so that the information is conveyed in an accurate, nuanced, and accessible manner.

- **Prioritize equity:** Suboptimal communication has the potential to exacerbate health disparities and undermine the goals of fostering equity and trust. Communicators should make additional efforts to engage with and address the needs of vulnerable, underserved, and traditionally marginalized populations during communication development and dissemination to avoid exacerbating disparities. Communication efforts should be sensitive to the fact that people may have to balance competing priorities.

Specific Objectives

This report highlights recommended practices drawn from behavioral and social science research that can be used to inform COVID-19 vaccine communication efforts. The intended users of this report are those charged with COVID-19 vaccine communication across federal health agencies and their partners at the state and local levels. The recommendations put forth in this report are evidence-informed, actionable, and responsive to the unique circumstances and challenges facing the United States with regard to the COVID-19 pandemic.

The recommended strategies are organized around three critical and interrelated strategic considerations that should guide the planning and implementation of COVID-19 vaccine communication:

1. **Define the goals of vaccine communication (What)**
2. **Identify the needs and perspectives of the intended audience (Who)**
3. **Create and disseminate messages tailored to the intended audience (How)**

The following sections provide details and examples for each of the strategic considerations. For any communication planning and implementation effort, all three considerations are important and may intersect in unique ways depending on the goals, target audience, resources, and time available for message tailoring and dissemination, among other practical factors.

1. Define the goals of vaccination communication

The first step in any communication effort should be to identify communication goals, because these goals will inform message content, format, mode of delivery, and required partnerships. Within the complex landscape of COVID-19 control and risk mitigation are a number of distinct and high-priority communication goals—such as conveying information about vaccine efficacy and safety, addressing vaccine hesitancy, or mitigating the impact of misinformation—each of which may necessitate a different approach. On the next page, we outline critical considerations for establishing goals in COVID-19 vaccination communication efforts.

1.1 Establish top-line messages regarding COVID-19 vaccination

Developing a core set of messages, along with harmonized themes, images, and branding can help ensure consistency of vaccine information across different entities and sources. Top-line messages should provide accurate vaccine information, acknowledge people's concerns where appropriate, and increase vaccine confidence and acceptance. Currently (as of December 2020), critical content for COVID-19 vaccination messages should include **assurance of vaccine safety and efficacy, evidence that the benefits of vaccination** (i.e., protection from the virus) **outweigh the risks,** and **a focus on the collective benefits of high vaccination coverage.** Emphasizing the importance of completing the two-dose vaccine series will also be critical to ensure adherence. In addition, messages should establish social norms for vaccination—for example, by increasing the perception that members of one's social group plan to or have already been vaccinated[10]—and emphasize how herd immunity resulting from high vaccine uptake can protect the health and well-being of others.[11,12] Finally, vaccination messages cannot be divorced from overall pandemic control efforts and the need for continued preventative behaviors, including social distancing and mask wearing, until COVID-19 community transmission is halted. Messages should therefore clearly explain why vaccination alone, although beneficial, will not offer a quick end to the pandemic, at least in the early stages of rollout.

> **Key goals of COVID-19 vaccination communication**
>
> - Provide assurance of vaccine safety and efficacy.
> - Highlight the collective and individual benefits of vaccination.
> - Explain the vaccine development, FDA approval, monitoring, and distribution process.
> - Address vaccine hesitancy and respond to dominant concerns without judgment or overly directive language.
> - Monitor misinformation and develop counter messages.

This core content then can be adapted to fit a given community's context, concerns, and preferred communication channels and developed into a tailored message (detailed in Section 3 below). Moreover, in crafting top-line messages, it will be critical to acknowledge and respond to the evolving scientific knowledge about various COVID-19 vaccines, which is an expected part of the vaccination administration process. Top-line message content may need to be adjusted to account for any documented differences in the various vaccines, who will receive them, and when they will receive them, so that this information can be quickly and consistently communicated to the public.

1.2 Address vaccine hesitancy before and during rollout to reinforce COVID-19 vaccine confidence

Hesitancy or resistance to vaccination is multifaceted and requires different approaches based on the level of hesitancy and the specific concerns driving hesitancy in the targeted community. For example, for some, vaccine hesitancy may stem from deep distrust of certain institutions, such as the media, government agencies, or pharmaceutical companies.[13,14] For this group, communication from more trusted sources will be

essential to reducing vaccine hesitancy. For others, hesitancy may be driven by concerns over the accelerated development timeline for COVID-19 vaccines. These individuals may be eager to gain knowledge from trusted experts about the steps taken to develop and evaluate the vaccine to support them in making an informed decision about vaccination. Hesitancy arising from the false, but understandable, perception that the development and approval of COVID-19 vaccines has not been as stringent as the process for other vaccines could be addressed by transparently **explaining the vaccine development processes** from clinical trials to reviews by U.S. Food and Drug Administration (FDA) panels to authorize use to subsequent monitoring for safety and effectiveness. It is important to note, however, that as knowledge about vaccines and rollout evolves, new concerns and questions about particular vaccines may emerge, requiring government agencies and their partners to adjust and respond quickly.

In addition to unique concerns driving vaccine hesitancy, individuals' personal values and beliefs, such as those related to self-determination vs. fatalism or individualism vs. collectivism, are likely to influence uptake of preventative health measures, including vaccination.[15–18] Understanding a community's dominant values and beliefs can help inform the development of effective messages to build vaccine confidence in the community.

Furthermore, a distinction exists between those who may be hesitant about COVID-19 vaccines and those who have complete mistrust in vaccines. A poll conducted in November 2020 found that 42 percent of Americans are hesitant about receiving a vaccine, with 12 percent reporting not trusting vaccines in general.[2] Communicators should avoid grouping those who are only hesitant to vaccinate, but not entirely opposed, with people who are actively opposed to all vaccination. Research on childhood vaccines suggests that there is a **window of opportunity for influencing people who are initially vaccine hesitant** before their views become ingrained.[19] Therefore, hesitancy should be addressed early in the vaccine rollout process, because the longer people stay uncertain and their concerns go unaddressed, the less likely they are to get vaccinated.

For those who have expressed a deeper general mistrust in vaccines, communication should still be **balanced, empathetic, and compassionate.** Even if this approach does not immediately lead to vaccine acceptance, it could help build relationships and trust, which may lead to greater willingness to consider vaccination in the future.[20] Furthermore, attempting to directly contradict their anti-vaccine stance could lead to defensiveness and psychological reactance and further reduce their willingness to vaccinate.[21] Messages targeting this group might include acknowledgement of some of the dominant concerns about vaccines but emphasize the evidence for the vaccine's safety and efficacy.

More generally, communication efforts targeting any group should **avoid judgment, shaming, or excessive directiveness,** because messages with these characteristics have been found to be counterproductive in previous public health campaigns.[22,23] Avoidance of judgment allows people to feel that their concerns and values are respected and indeed "heard" by public health officials. Dismissing or leaving these vaccine concerns unaddressed creates an opportunity for anti-vaccine groups to further sow doubt in vaccines and gain credibility for their own misinformation by effectively aligning their anti-vaccine messages with their target groups' core concerns and values.[24]

1.3 Mitigate the impact of COVID-19-related misinformation

The spread of health-related misinformation was a significant public health concern well before the COVID-19 pandemic. During the last decade, vaccine-related discourse online and in the media has been plagued

by misinformation.[25,26] Anti-vaccine groups have leveraged political and social divisions to diminish trust in vaccines, pushed false narratives questioning the safety and effectiveness of vaccines, spread false claims about adverse outcomes, and downplayed the risks of the diseases vaccines protect against.[24,27–30] In the case of the current pandemic response, a recent joint statement from global public health organizations asserted the extent to which misinformation and disinformation have undermined public health response.[31] Social media has facilitated the rapid and widespread sharing of inaccurate information and outright falsehoods about many aspects of the COVID-19 pandemic,[32] from denying or downplaying the severity of the virus to casting doubt on public health guidance to spreading vaccine conspiracy theories. COVID-19 vaccine communication efforts cannot ignore misinformation and must take actions, informed by behavioral and communication research, to identify emerging rumors and respond in a way that is informed by behavioral science.

Real-time, agile, and scalable monitoring of discourse concerning COVID 19 vaccination—including conspiracy theories, rumors, and myths—can support a swiftly developed and implemented response. "Misinformation surveillance" efforts should identify the most prominent sources of misinformation, the tactics being used, and the groups most at risk of being exposed to and influenced by the rumors. This information, in addition to data regarding the dynamics and patterns of misinformation spread, could help inform the appropriate response and best targets for intervention efforts. Understanding the emerging themes, values, logic, or concerns underlying the false claims or conspiracy theories can also inform the **development of effective counter-messages.** Developing competing messages that address the same concerns or beliefs held by those who might be vulnerable to misinformation could be important to countering the effects of misinformation exposure, especially if these counter-messages can penetrate online information silos where misinformation circulates.[33] Research suggests that exposure to detailed messages debunking misinformation can be effective[34,35] and that exposure to multiple sources of information outside an individual's siloed communication circle can result in a more accurate credibility assessment.[36] Therefore, broad exposure to multiple sources of factual counterarguments that have been developed according to best-practice recommendations could be an effective way to induce misinformed individuals to update their beliefs.

It is important to recognize that not every piece of misinformation requires an immediate counter-response. Public health organizations do not typically have the resources or capacity to address every piece of misinformation. When a rumor seems to be gaining widespread traction and has the potential to either cause harm or undermine critical health promotion efforts, however, intervention will be required. Correcting the false claim contained in the message, exposing the tactics used by disinformation agents, and inducing skepticism by highlighting the ulterior motives of these actors are all potentially effective strategies for mitigating the impact of misinformation.[37–39] Communication research also points to a few general actions to *avoid* when responding to misinformation: (1) **Do not repeat the falsehood,** because such repetition can have a priming effect. (2) Do not assume that those who are generally well informed about health information are immune to being influenced by falsehoods. (3) Do not assume a one-time effort will be sufficient, because **communication effects are often incremental and require persistence and consistency.**[39]

Finally, although research suggests that certain tactics can effectively mitigate the impact of misinformation and that debunking can work in certain situations, preemptive measures that either prevent people from being exposed to misinformation in the first place or allow them to identify and dismiss misinformation when they encounter it could be the more effective approach. For example, communication science indicates that inoculating people against misinformation by warning them about potential misinformation exposure

and preemptively refuting a "weak" version of the misinformation could make people more psychologically resistant to misinformation.[40]

2. Identify the needs and perspectives of the intended audience

To develop the most effective and equitable communication strategies, efforts must be made to first identify and understand the perspectives of the intended audience. Indeed, **audience segmentation** is a critical step in message development.[41] Once the target audience is defined, **population-specific concerns, motivations, and information needs must be considered.** Vaccination decisions will, in part, depend on perceptions about individual and community risk. For example, young adults may be less concerned about their own health but more motivated to prevent infection in older family members. For some, a motivating factor may be returning to work or resuming social gatherings, whereas older adults and those with co-morbid health conditions may be more motivated to reduce their own risk for severe illness or death.[42] It is also important for public health communicators to understand that their audiences are not "blank slates," and previous experiences and mental models of disease, vaccines, and risk will influence response to messages and recommendations.[43] Furthermore, it is important to recognize that getting vaccinated against COVID-19 may not be the highest priority for some people, who may perceive other risks (unemployment, food insecurity, deportation) to be a much greater threat to their well-being.

Importantly, the COVID-19 pandemic is having a disproportionate impact on people who already experience disadvantage by virtue of their race, ethnicity, and socioeconomic conditions. Research shows that racial and ethnic minorities, in addition to having less access to health care, are more likely to be infected and have poor outcomes after infection with COVID-19, such as being four to five times more likely to be hospitalized.[44,45] Some communities of color also have historically justified distrust of the medical system, which requires careful attention and understanding. Transparent and effective communication must acknowledge and address this interplay between population-specific needs and motivations, vaccine allocation and distribution, and the current and historical context driving hesitancy in various high-risk populations.

Another key consideration in audience segmentation, given that the initial availability of vaccines is likely to be limited, is alignment with the vaccine rollout process developed by the federal, state and local governments.[46,47] Certain factors—such as risk for acquiring infection, risk for severe morbidity and mortality if infected, and potential to transmit infection to others—will determine an individual's vaccine access over time. When limited doses of the vaccine are available, individuals working in health care settings will be the first to be eligible for vaccination, followed by those at highest risk for poor outcomes, such as those with high-risk comorbidities and individuals 65 years of age or older. Other populations of focus include those who perform the essential functions of society other than health care (e.g., public safety, food supply chain, school and daycare personnel); those at increased risk of acquiring COVID-19, such as those living or working in congregate settings; and those with limited access to health care, such as rural communities and individuals experiencing homelessness. The initial response to vaccine rollout (e.g., rate of uptake, expressed hesitancies and concerns, any purported serious adverse events) will have a substantial impact on subsequent vaccination in later groups. Therefore, it is imperative that vaccination communication efforts that can rapidly address emerging concerns are in place for the first groups who are allocated to receive the vaccines.

Important population-specific considerations and concerns could contribute to lower vaccine confidence, and communication strategies must be mindful of these issues to be effective. The sections below highlight a sample of specific populations to consider. Note that this is not a comprehensive list but is intended to illustrate a range of communication considerations based on unique population attributes and contexts. Additionally, communication efforts must account for intersectionality across age, health status, race, and other sociodemographic factors.

2.1 Health care professionals

Frontline health care personnel, as well as ancillary staff who work in health care settings, will be prioritized for initial vaccine access.[48] Concerningly, vaccine hesitancy has been reported in this group, with recent reports suggesting that only about two-thirds of health care workers are willing to be inoculated with COVID-19 vaccines.[49] Hesitancy among health care workers seems to be less about overall distrust in vaccines or in the institutions developing the vaccines and more connected to specific concerns about the lack of longer term data on efficacy and potential side effects of the new vaccines.[49] For this group, **clarity and transparency of information** concerning the rigor of the clinical trial process, ongoing safety data from clinical trials, and the FDA approval process (including Emergency Use Authorization) is likely to increase vaccine confidence and uptake. Ensuring accurate and transparent vaccine messaging and increasing vaccine confidence among health care workers is foundational to successfully instilling vaccine acceptance in other populations. When health care professionals are vaccine confident and commit to vaccinate themselves, they are more likely to discuss and recommend vaccination to their patients, serving as vaccine champions and hence contributing to broader vaccine acceptance across communities.

2.2 Older adults and individuals with underlying medical conditions

Older adults (65+ years of age) and individuals with high-risk medical conditions (e.g., diabetes, heart disease, chronic obstructive pulmonary disease, cancer) or risk factors for severe COVID-19 illness (e.g., smoking, obesity)[50] will be another priority group for vaccination due to their increased risk for infection and related complications.[46] Older adults living in long-term care facilities are recognized to be especially vulnerable, and additional considerations relevant for this population are discussed below (see Section 2.6). Many older adults are justifiably worried about getting severely ill from the COVID-19 virus, and many are ready to be "first in line" to get inoculated.[51] A substantial proportion of this highly heterogeneous group, however, still may be hesitant about receiving the vaccines.[51] This hesitancy may be further exacerbated by social media misinformation, with some research suggesting that older individuals might be particularly vulnerable to being misled in the digital environment.[52] Note that whereas older age and health risk factors affect all segments of society, many high-risk medical conditions are more prevalent in some racial and ethnic minority groups, as well as underserved low-income and rural populations. For instance, people in communities of color are more likely to develop serious illness following COVID-19 infection, in part due to higher rates of underlying health conditions.[44] Many individuals at the highest risk for the poor health outcomes may also have the most limited access to health care and reliable health information. As such, **facilitating access to vaccine information at the appropriate health literacy level** will be particularly important when developing messaging for these groups.

2.3 Non-health-care essential workers

Those playing a critical role in keeping society's essential functions running and who cannot effectively socially distance in the workplace are likely to be among the groups that receive priority vaccine allocation. These essential workers include emergency and public safety personnel, food packaging and distribution workers, teachers and school staff, and childcare providers. It is important to note that many essential workers are also from groups that have been historically marginalized in society. Many service-industry jobs, for example, are low wage and filled by people of color or new immigrants. Compassionately addressing their concerns and priorities in communication about the vaccines will require an assessment of unique and critical factors contributing to essential workers' vaccine hesitancy, such as fear about being used as vaccine "guinea pigs" resulting from distrust in the government or pharmaceutical companies. Although the reasons for early vaccine allocation to this group are scientifically sound and well justified from a public health perspective, there is the potential for widening disparities and suboptimal uptake if the perception is that low-paid and often historically undervalued workers are being asked to take the risks of early vaccination. Therefore, communication strategies should address this groups' information needs to foster vaccine confidence while **preserving their decisionmaking autonomy.**

2.4 Racial and ethnic minority populations

The COVID-19 pandemic has amplified the social and economic factors that contribute to higher infection rates and poor health outcomes among many communities of color. In addition to the higher prevalence of underlying medical conditions discussed above that are related to social and economic disparities, Black, Indigenous, and people of color (BIPOC) are more likely to be essential workers or live in housing arrangements that make it more difficult to avoid exposure to COVID-19.[44,53] Importantly, long-standing systemic racism and historical scientific misconduct make many BIPOC individuals more reluctant to trust the medical establishment and thereby accept vaccines.[3,14,54] To address distrust and vaccine hesitancy among racial and ethnic minorities, health information should be developed and delivered by **sustained partnerships with community organizations trusted and respected by the target audience** to support vaccine decisionmaking. In addition, extra efforts need to be made to respect this population's autonomy and their ability to make informed decisions about vaccination. Messages need to balance inspiring trust through messengers embedded in the community and providing vaccine information in a transparent and inclusive way that supports autonomy. In addition, providing culturally appropriate, multilingual vaccine communication materials in the online spaces and physical locations (e.g., grocery stores, community centers) that are commonly accessed by racial and ethnic minority populations is vital to ensuring that information reaches these communities.

2.5 Vulnerable communities with limited access to routine vaccination services

Underserved rural residents, homeless populations, and migrant communities (including those without legal residency) are critical populations to prioritize for vaccination communication. In addition to perpetuating existing disparities, if these populations are not addressed in communication outreach plans, the vaccines will not reach their full effectiveness potential because of insufficient population-level uptake. Some of these groups may have to overcome significant logistical barriers (e.g., poor access to regular health care or lack of

insurance, long distances from vaccine administration sites, lack of childcare to allow them to take the time to get vaccinated) while also lacking access to accurate information regarding COVID-19 vaccines (e.g., due to limited Wi-Fi access or literacy challenges). Messages targeting these populations need to directly **address actual and perceived barriers, facilitate information access, and foster self-efficacy** to take the actions needed to get vaccinated.

2.6 Individuals living in congregate settings

Residents in congregate setting—such as long-term care facilities, group homes, prisons, and detention centers—are at increased risk of acquiring and transmitting COVID-19.[55] Residents of long-term care facilities are being prioritized for initial vaccine access,[48] so communication that addresses their unique concerns and the concerns of their families should be a priority early in the rollout. Also, some people living in confined settings, such as prisons and detention centers, fear contracting the virus and being unable to receive adequate care. Acknowledging their vulnerable situation and unique concerns in vaccination communication will be critical. A one-size-fits-all communication strategy in these congregate settings, however, is unlikely to be successful because vaccine uptake will require addressing the needs and concerns of multiple stakeholders within the system. For example, administrators may worry about liability, front-line workers may have concerns about safety, and individuals living in the congregate setting may have concerns related to the perception of medical experimentation and loss of self-determination and decision autonomy. Messaging should be **sensitive to the unique needs of each stakeholder in congregate settings.**

2.7 Children and pregnant women

Although clinical trials are underway, the safety and efficacy of COVID-19 vaccines is not currently known for children and has not yet been tested in pregnant women. Messages that address the unique considerations in these groups, however, still should be developed preemptively. Although children have lower risk of severe outcomes or death from COVID-19, infection still poses a risk to the child and the adults in the child's social orbit.[56] Once vaccines are approved for children, communication efforts will need to help caregivers weigh the benefits and risks of vaccination to the child and their social network by **addressing valid concerns about side effects or adverse outcomes** while also **responding to misinformation about other childhood vaccines.** Concerns may also vary by the child's age, with potentially greater safety concern in infants or very young children, and desires for older children to return to school. Moreover, early evidence indicated more severe illness and hospitalization in pregnant women due to COVID-19,[57] although recent studies suggest otherwise.[58] Considering the conflicting information, communication should incorporate the latest knowledge while also portraying transparency behind the uncertainty of higher risk. For this group, communication will need to consider messages that encourage protecting one's own health and the health of the community, in addition to **clear messaging about issues of safety, benefits, and risk to both the pregnant woman and her unborn child.**[59]

3. Create and disseminate targeted and tailored messages for the intended audience

For any identified goal and target audience, effective message development should align with the community's values and preferences and come from **trusted sources,** which **might not include government agencies.**

Because communication needs to persist over time, vaccination communication strategies must also adapt to evolving information about the vaccines (e.g., newly published trial results) and guard against information fatigue. The following evidence-informed strategies have demonstrated success in other health behavior domains and can inform the development and dissemination of COVID-19 vaccine messages.

3.1 Identify and partner with trusted COVID-19 vaccine messengers

Successful partnerships between governmental agencies and trusted community entities and leaders as "messengers" can facilitate tailored communication and enhance message acceptance in different communities. The partnerships should be sustained throughout the communication planning process, rather than simply asking messengers to "lend their microphones." In fact, **co-creation and co-dissemination of key messages** and delivery formats between public health agencies and these trusted messengers is more likely to ensure that the communication strategies align with the values and priorities of the communities of focus. Moreover, while rapidly activating existing and new partnerships are required by the urgency of the pandemic crisis, public health communication needs will continue into the future, well past the current pandemic. It would be a significant lost opportunity if current COVID-19-related efforts do not **expand the base of public health messengers** and build **stronger and more sustainable partnerships**—that

Targeted and tailored vaccination messages

- Partner with a wide range of trusted information sources: Co-design and co-disseminate messages with community partners.

- Establish COVID-19 vaccination as an accepted social norm (e.g., through "I got the shot" stickers or sharing vaccine intention through social media).

- Consider behavioral nudges for vaccination (e.g., favoring opt-out vs. opt-in, making receiving vaccination convenient) while respecting decision autonomy.

- Avoid language of requirement and mandate.

- Convey a message of unity and bipartisanship in vaccination, and avoid language that sows divisions or conveys judgment.

- Ensure that all messages are accurate, transparent, and truthful; avoid exaggerating the benefits or minimizing the risks of vaccination; be clear that the vaccine is not an instant fix or a "silver bullet."

- Incorporate the values and beliefs of the target audience, such as protecting one's community or caring for those at higher risk.

- Induce positive emotions and avoid communication (including nonverbal) that heightens negative emotions, such as fear or shame.

- Use simple graphics, images, personal experience narratives, "edutainment", or short videos to creatively distill vaccine information.

endure beyond the current health crisis—between governmental agencies and communities hit hardest by the pandemic. The following strategies can inform effective partnerships with trusted messengers.

First, it is critical to **identify the most trusted sources of information for the population of focus,** including individuals, organizations, and media outlets/platforms (e.g., online influencers, journalists, religious leaders, community organizations, and celebrities and other public figures). Building partnerships with entities that have established trusted relationships with communities can help rapidly activate and mobilize a community and dispel concerns or distrust. Examples of potential messengers include tribal leaders, historically Black colleges and university (HBCU) leaders, sororities and fraternities, the U.S. Department of Agriculture's Cooperative Extension Service, and multidenominational religious leaders and organizations. Relationships with these entities need to be bi-directional, and public health agencies must proactively listen to community concerns.

Even when partnering with trusted brokers of information, careful consideration of how activities might be perceived by the target community is important. As an example, some HBCU leaders recently volunteered in COVID-19 vaccine clinical trials to counteract the distrust that they worried was putting communities of color in greater risks for COVID-19. They received opposition from their communities for their involvement in the trials, however, because of the ingrained hesitancy to trust medical systems based on the history of unethical medical experimentation on African Americans.[60] This situation demonstrates that building partnerships with trusted sources, such as HBCU leaders, may not be sufficient as a standalone strategy to overcome distrust. Moreover, one group's trusted source may, in fact, be considered very untrustworthy by another group (e.g., scientists, political leaders), therefore partnership efforts should be carefully considered to ensure that attempts to increase trust in one community do not undermine trust in another.

Vaccine communication partnerships should include diverse sectors and stakeholders. **Collaborations with health care organizations and pharmacies** are critical, and these partnerships must go beyond front-line caregivers, such as doctors and nurses, and include organizations like Federally Qualified Health Centers and state and local public health departments and jurisdictions, as well as health care extenders, such as pharmacists and community health workers. Moreover, **partnerships across different government communicators, scientists, and journalists** will inform how the science of vaccines is conveyed. Broadening the links between journalists and the scientific, pharmaceutical, and public health communities will ensure that as the situation evolves, new information is communicated in a truthful manner that avoids inflaming divisions or furthering mistrust and distrust in the health sciences. In addition to organizations, **public figures and online influencers** will also be important partners in communicating to audiences who are less likely to attend to information disseminated by government, traditional media, or scientists. Examples include celebrities, such as actors, musicians, athletes, and social media influencers. These types of communicators can improve vaccine attitudes and acceptance by conveying messages that resonate with the target audience in both style and substance.[61]

As part of the partnership-building process, it is important to acknowledge that although COVID-19 efforts in the United States have been hampered by politicization, vaccine confidence could be enhanced through **unified, bipartisan communication of consistent messages** across diverse communities and information

silos. Indeed, COVID-19 vaccine messages should aim to **promote unity and apolitical decisionmaking** regarding vaccination. Prior politicization may need to be acknowledged and addressed in some cases, but moving forward, ideological divisions should be de-emphasized in all communication efforts to create a **message focused on unity and collective benefit.** An example of promoting unity around vaccination might include having politicians from across the political spectrum jointly signal their vaccine confidence in a public health campaign.

3.2 Create accurate, transparent, and truthful vaccine messages

In addition to considering and leveraging trusted messengers, vaccination messages themselves need to be trustworthy. Emphasis on creating messages that are **accurate, transparent, and truthful** will help ensure trustworthiness. Messages need to present clear and accurate information and avoid either exaggerating the benefits or minimizing the potential risks of vaccination. Acknowledging uncertainty, as well as emphasizing that changes in what is known are expected and appropriate as scientific knowledge evolves, could help preempt skepticism when messages are updated.

As part of societal reinforcement for getting vaccinated, communication must acknowledge that herd immunity will not be reached until a sizeable majority of the population is vaccinated, with estimates that anywhere between 75 and 90 percent coverage likely will be needed, depending on vaccine efficacy.[62,63] Communication may stress that the sooner most people complete their vaccinations, the sooner we will be able to return to normal social and economic activities. Messages, however, should also emphasize that, at least during initial phases of the rollout, a COVID-19 vaccine is not a "magic bullet" that will immediately allow a full return to social functioning. Instead, it is important that messaging emphasize that until society is widely vaccinated, the need continues for both preventive behaviors—such as mask wearing, hand washing, and social distancing—and public health measures, such as contact tracing and widely accessible testing.

3.3 Frame vaccine acceptance as a social norm

Vaccine communication efforts should also include approaches that **establish getting the vaccination as a social norm.** Social norms, defined as the standards against which the appropriateness of a certain behavior is assessed, are a powerful form of contextual influence over human behavior.[64] Social norms are more heavily influenced by the views and behaviors of a network of peers than by expert advice. Intervention strategies aimed at modifying social norms could positively influence the decision to vaccinate. Such intervention strategies could include **promotional materials that induce peer pressure** to vaccinate (e.g., "I got the shot" stickers akin to "I voted" stickers or "share your vaccination experience" campaigns). This type of strategy not only communicates pride in the behavior, affirms pro-health values, and supports self-concept as a contributing citizen, but also serves a "norming" function that capitalizes on regret avoidance (engaging in a behavior to avoid anticipated regret). The goal of this type of communication is to convey that getting vaccinated is widely accepted and widely practiced, and not engaging in the behavior might result in social sanctions.[65]

Another example of a communication strategy to influence social norms would be a campaign that encourages individuals who chose to get vaccinated to share their vaccination experience with others in their social network (e.g., verbally, through text messages, on social media) and encourage their networks to get vaccinated if

they have not done so already. Visual aids—such as thermometers, heatmaps, or dashboards—can also be used to reinforce social norms by tracking increasing vaccination uptake at the state or local levels. Finally, publicizing the vaccination of celebrities and public figures, including bipartisan political leaders, could have a powerful impact on normalizing vaccination across diverse segments of society.

3.4 Use behavioral nudges

In addition to establishing norms around vaccination, behavioral economics research demonstrates the **potential of using choice architecture to "nudge" people to engage in particular health behaviors,** such as vaccination, while retaining and respecting decisional autonomy.[66] Making vaccination an easy and convenient choice is key to increasing uptake. For example, making vaccination the default choice, so that people need to actively opt-out of receiving a vaccine if they don't want one, could be a very effective way to increase uptake while still respecting people's self-determination in health-related decisions.[67] Similarly, medical providers could use more of a presumptive approach during health care encounters and offer the vaccination to all eligible patients, as this would signal that getting vaccinated is the accepted "norm" while still allowing the patient to ultimately make their own decision.

Similarly, providers, health care systems, and pharmacies may also leverage electronic patient portals (e.g., by sending messages to patients prior to a medical appointment or prior to a prescription refill) to encourage individuals to vaccinate. These messages could provide information on the vaccine's availability, logistics of where and how to receive the vaccine, and electronic reminders about receiving the second shot. Social media platforms could also be used to nudge people toward vaccination against COVID-19; in addition to providing information on where and how to receive a vaccine, these sites could be used to offer opportunities for individuals to publicly commit to vaccinate. Such public commitment increases the chances that a person will follow through with the desired behavior[68] and could encourage others in their social networks to do the same.

Additional strategies to encourage vaccine uptake could include competition, gamification, and incentives related to vaccination behaviors. Incentives, particularly, are increasingly seen as an important tool for health behavior change, and research suggests that appropriately designed incentives can be effective for some behaviors.[69] It is important to consider carefully how to message incentives, however, so that they promote autonomy and motivation for getting vaccinated.[70] Otherwise, incentives might encourage some to get vaccinated, while for others, an incentive may inadvertently signal a risk (e.g., "if they are paying me to receive a vaccine, there must be something wrong with it"), which could undermine their motivation to be vaccinated.

3.5 Enact value-concordant messaging that is sensitive to the emotional state of the audience

When choosing the spokesperson who will deliver the message, a degree of surface-level concordance (e.g., communicators who look like members of the target population) can enhance message receptivity and acceptance.[71] Having popular celebrities, such as artists and athletes, speak to their fan base is an example of superficial-level targeting and may be very effective. In contrast, messaging based on deep structures would involve addressing the core values that may be unique or particularly salient to a target group, which may further enhance communication effectiveness.[72] This begins with assessing the **dominant values of a**

target audience group and then embedding such values into vaccination messages. For example, some messages might **invoke a personal leadership role as a protector of the community** (be a hero/shero), whereas other messages might **build on desires to resume certain activities** (get back to work/school) or frame vaccination as a way to **enact social justice, equity, or altruism** (protect vulnerable people or those at higher risk). Messaging such as "Protect your family, if not yourself" can help reframe the motivation for getting vaccinated from decreasing personal risk to helping others (e.g., older parents, teachers, those who are immunocompromised), thus preventing message reactance (resulting from the perception that choices are being taken away).

Vaccination communication should also **avoid language such as "requirement" or "mandate"** as this type of directive and authoritative language can generate further resistance and be perceived as restricting individual choice. Relatedly, vaccination messaging should **consider emotional valence.** Messages and images that **heighten negative emotions, such as fear or shame, may induce avoidance behavior,** and such emotional over-amplification should generally be avoided.[73] Conversely, messages that **evoke positive emotions**—such as happiness, hope, and a sense of self-worth for engaging in the vaccination behavior—may effectively promote vaccine confidence. Considering emotions, neither the message text nor the accompanying imagery should elicit fear or dread, but they should instead convey hope and well-being associated with getting vaccinated, including taking action to protect one's loved ones.

3.6 Creative strategies: Going beyond didactic vaccine messages

Communication messages should be as concise as possible and clearly convey the action-oriented "bottom line." **Simple graphics, numbers, images/visuals, or short videos** can be effective in distilling complicated statistical and scientific information into digestible messages.[74] Other communication strategies, such as entertainment-education ("edutainment") and the **sharing of personal experience narratives or storytelling,** particularly by popular and trusted spokespersons, may be more motivating than facts and statistics.[75,76] Research has shown that narratives can effectively influence beliefs, attitudes, intentions, and behaviors,[77] and stories have been adopted to great effect by anti-vaccine advocates, whose sharing of emotional personal stories about injuries they perceive to stem from vaccination has influenced the public's vaccine perceptions. Conversely, **authentic narratives from relatable spokespeople** about how they were positively affected by receiving the COVID-19 vaccination could be equally compelling and persuasive. These personal stories could also help allay fears, address hesitancy, and encourage uptake.

Conclusion

This report outlines foundational considerations for health communication activities and expands on those considerations with evidence-informed strategic communication recommendations specific to fostering COVID-19 vaccine confidence across diverse audience segments. To achieve herd immunity, a high rate of COVID-19 vaccine uptake in the population is crucial, and this will require timely and effective communication to address the public's concerns. Evidence-informed communication is a critical component of the complex puzzle that will help end the COVID-19 pandemic. In this way, communication about COVID-19 vaccines can benefit from drawing on the extant social and behavioral science literature about successful strategies to influence health decisions and behaviors. Communication strategies, however, would also benefit from ongoing evaluation so that they can efficiently adapt to real-time changes in COVID-19 vaccine research, as well as the evolving public health communication context. No single communication approach or message can address all COVID-19 information needs, perspectives, and concerns over time, but careful consideration and continuous reevaluation of communication efforts will help reduce vaccine hesitancy, enhance vaccine confidence, and bolster uptake.

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