



Evolving U.S. Public Opinion and Communication Strategies on the COVID-19 Vaccination

Robb Shawe, Ph.D., MS,

Department of Emergency and Protective Services, Capitol Technology University, Laurel, MD, United States.

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***Corresponding Author:** Robb Shawe, Ph.D., MS, Department of Emergency and Protective Services, Capitol Technology University, Laurel, MD, United States.

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Abstract

Recent trends in U.S. public opinion regarding COVID-19 vaccination reveal an evolving landscape of vaccine acceptance, hesitancy, and booster uptake. Drawing on the latest national surveys and peer-reviewed studies, the analysis integrates four key communication theories—Uses and Gratifications, Diffusion Theory, Spiral of Silence, and Situational Theory—to interpret how media use, information diffusion, social pressures, and situational factors influence vaccine attitudes and behaviors. Current data highlight persistent demographic and regional disparities, the impact of misinformation, and the importance of trust in public health institutions. The effectiveness and safety profiles of the latest COVID-19 boosters are compared to earlier vaccines, demonstrating the ongoing need for targeted outreach and adaptive communication strategies. Regional case studies and a set of future recommendations illustrate how tailored messaging and community partnerships can address persistent gaps and support equitable vaccine uptake across diverse U.S. populations.

Keywords: COVID-19 Vaccine, Public Opinion, Communication theory, Vaccine Hesitancy, Booster Uptake, Misinformation, Regional Disparities, Health Communication, United States

Introduction

Public opinion about the COVID-19 vaccine has shifted rapidly, driven by new scientific data, evolving communication strategies, and developments in vaccine safety and effectiveness. As of early 2024, about 76% of U.S. adults have received at least one vaccine dose, but only 28% have received the latest booster, with significant gaps across age and demographic groups. These changes in attitude are closely linked to updated information and the impact of communication methods. This document applies four key communication theories—Uses and Gratifications, Diffusion Theory, Spiral of Silence, and Situational Theory—to analyze how media use, information diffusion, social pressures, and situational factors shape vaccine attitudes and behaviors in the United States. Each theory is used to interpret current trends, highlight the influence of digital and traditional media, and explain the persistence of hesitancy and disparities. By previewing these theoretical applications, the document provides a framework for understanding how communication strategies have shaped, and

continue to shape, vaccine opinion formation in a landscape of constant change. The analysis draws on regional case studies—including mobile vaccination clinics in New York City, church-based outreach in Alabama, and multilingual campaigns in California—to illustrate how communication strategies adapt to local contexts and demographic challenges.

Uses and Gratifications Social Media Model

Based on the foundational work of Katz, Blumler, and Gurevitch [1], the Uses and Gratifications Social Media Model explains that individual motivations for media use determine exposure to vaccine information and misinformation. Media use patterns shape how people encounter and interpret vaccine information. Passive social media users, such as those on Instagram, tend to encounter more positive vaccine messaging [2], while active engagement—especially on platforms like TikTok—is linked to greater exposure to conspiracy beliefs and skepticism [3]. This theory emphasizes the need to understand platform-specific behaviors to address misinformation and promote accurate information effectively.

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Recent U.S. survey data reveal that passive social media users, particularly on platforms like Instagram, report higher acceptance of COVID-19 vaccination, while active engagement, especially on TikTok, is associated with increased exposure to misinformation and vaccine skepticism [2, 3]. This pattern supports the Uses and Gratifications framework by showing how user motivation and engagement style shape both the content encountered and subsequent vaccine attitudes.

Example: Platform-Specific Messaging

Diffusion Theory of Communication

Building on Everett Rogers' Diffusion of Innovations (1962), the Diffusion Theory of Communication describes how new ideas and innovations, such as COVID-19 vaccines, spread through society. Early adopters, like healthcare workers, are more likely to embrace vaccination due to trust in science and self-protection [4]. Late adopters, often from rural or marginalized groups, face unique access and cultural barriers [5]. This framework highlights the importance of identifying the characteristics of different adopter groups and addressing their specific concerns to encourage broader vaccine acceptance.

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National vaccination data align with Diffusion Theory, as early adopters—such as healthcare workers and older adults—achieved high initial uptake, while late adopters, including rural residents and minority groups, continue to report lower vaccination and booster rates [4, 5, 6]. These empirical patterns highlight the role of social networks, access, and cultural context in the diffusion of vaccine innovations.

Example: Early and Late Adopters

Spiral of Silence Model

Elisabeth Noelle-Neumann's Spiral of Silence theory (1974) explores how social pressure can silence dissenting opinions about vaccines, especially in polarized online environments. People may withhold skepticism if they fear social isolation, leading to an artificial sense of consensus [7]. Studies on food safety debates also show that perceived opinion incongruence and self-relevance influence willingness to speak out on controversial health issues [8]. This theory points to the need for open dialogue and safe environments for sharing diverse perspectives on vaccination.

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Empirical evidence from recent U.S. opinion surveys indicates that individuals in politically conservative or socially isolated communities are more likely to withhold vaccine skepticism, especially online, reinforcing the Spiral of Silence effect [7]. This dynamic may contribute to the persistence of vaccine hesitancy in certain demographic groups by limiting open discussion and reinforcing perceived consensus.

Example: Social Pressure in Online Spaces

Situational Theory of Communication

Developed by Grunig and Hunt (1984), the Situational Theory of Communication focuses on how people's engagement with vaccine information depends on their perceived risk and immediate circumstances. Those who feel more threatened by COVID-19 or encounter misinformation are more likely to seek credible sources, while others may remain disengaged [9]. Effective communication

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Survey findings demonstrate that individuals with higher perceived risk—such as those with underlying health conditions or living in high-transmission areas—are more likely to seek credible vaccine information and accept booster doses actively [9]. In contrast, those perceiving lower risk or exposed to misinformation often remain disengaged, illustrating the situational triggers described by this theory.

Example: Risk Perception and Information Seeking

Current Public Opinion Trends

A variety of social, demographic, and informational factors influences public opinion on COVID-19 vaccination in the United States. Recent evidence suggests multiple determinants are still driving attitudes to take the COVID-19 vaccine. CDC data show that while COVID-19 vaccine confidence is rising, vaccine hesitancy remains high in specific populations [6]. This CDC data highlights the importance of ongoing monitoring of vaccine attitudes. Most people believe that healthcare workers and at-risk communities, which include adult patients with underlying conditions and ethnic minorities, should be prioritized for vaccination; this signifies a good level of agreement with the highlighted recommendations in the country [6]. This prioritization reflects broad public consensus on risk-based vaccine allocation. Media trust is a significant determinant of COVID-19 vaccine attitudes. Patients who trust traditional media are motivated to get vaccinated in the future and are less hesitant to take the vaccine [10]. The influence of media trust demonstrates the role of communication in shaping vaccine confidence. Meanwhile, those who trust interpersonal communication diverge from this notion. This suggests that COVID-19 vaccine attitudes are complex and that communication strategies are instrumental in determining public attitudes towards the vaccine.

Recent national surveys provide a more detailed picture of current public sentiment, highlighting both progress and persistent challenges in vaccine uptake. National surveys conducted in 2023 indicate that approximately 80% of U.S. adults have received at least one dose of a COVID-19 vaccine. However, only about 60% report being entirely up to date with booster recommendations. Vaccine hesitancy remains particularly high among certain groups, including young adults, rural residents, and individuals identifying with some minority communities [6]. This finding points to the need for targeted outreach to these populations. Regional differences are also apparent, with Southern and Midwestern states reporting lower vaccination rates compared to the Northeast and West. Surveys highlight that concerns about vaccine safety, side effects, and the speed of vaccine development continue to influence public opinion. In contrast, trust in healthcare providers and public health authorities is consistently associated with higher vaccine acceptance [10]. Trust in healthcare providers is a key factor in vaccine decision-making. In addition, political affiliation and exposure to misinformation have emerged as significant predictors of vaccine hesitancy, with individuals identifying as politically conservative or receiving information primarily from social media exhibiting greater reluctance to get vaccinated. These findings underscore the ongoing need for targeted communication and outreach to address persistent gaps in vaccine confidence and to tailor strategies for different demographic and geographic groups.

These public opinion trends not only reflect the impact of evolving communication strategies but also exemplify the mechanisms outlined in the Spiral of Silence and Diffusion Theory. For instance, the clustering of hesitancy in specific regions and social groups highlights how social pressure and information diffusion shape real-world vaccine decisions.

A recent Pew Research Center survey from March 2024 found that 76% of U.S. adults report having received at least one COVID-19 vaccine dose, while just 28% say they have received the latest booster. The survey also revealed that vaccine acceptance is highest among adults over 65 (92% with at least one dose), but drops to 63% among those aged 18-29. Racial and ethnic gaps persist, with Asian and White adults reporting higher vaccination rates than Black and Hispanic adults. Trust in public health officials and political affiliation continue to strongly influence vaccine attitudes, with Democrats and those who trust the CDC being much more likely to be vaccinated and boosted compared to Republicans and those expressing skepticism toward public health messaging [6]. Additional national survey data support these findings. Vaccine attitudes are shaped by a complex interplay of trust and political identity [10].

Despite overall high rates of initial COVID-19 vaccination, recent data reveal that vaccine hesitancy remains a persistent issue, particularly regarding booster doses. According to the latest CDC and Kaiser Family Foundation reports, the most common reasons cited for hesitancy include concerns about potential side effects, doubts about the necessity of additional doses, and a belief that COVID-19 no longer poses a significant threat [6]. These reasons are consistent with prior findings on vaccine hesitancy. Hesitancy is most pronounced among younger adults, with nearly 40% of individuals aged 18-34 expressing reluctance or uncertainty about receiving boosters. Additionally, communities with lower levels of trust in public health authorities and higher exposure to misinformation, such as specific rural and politically conservative populations, consistently report lower booster uptake [10]. This highlights the importance of both information and trust in vaccine decision-making. These patterns underscore the importance of addressing both informational and trust-related barriers in future public health efforts.

Data from the CDC and state health departments in April 2024 show that vaccine uptake trends continue to vary widely by region and demographic group. Booster coverage is highest in the Northeast, where over 40% of adults have received the latest booster, compared to less than 20% in several Southern states. Urban areas consistently report higher vaccination and booster rates than rural communities. Among adults aged 65 and older, uptake of the latest booster exceeds 60%, while rates among adults under 30 remain below 20% [6]. This regional and age disparity is significant for public health planning. These disparities highlight persistent challenges in reaching specific populations and reinforce the importance of localized and tailored communication strategies [10]. Tailoring communication to local needs can help address these ongoing gaps.

Demographic analysis from 2024 CDC and Pew Research Center data reveals persistent gaps in vaccine and booster uptake by age and ethnicity. Adults over 65 continue to lead in vaccination rates, with more than 92% having received at least one dose and over 60% up to date on boosters. In contrast, only 63% of adults aged 18-29 have received at least one dose, and fewer than 20% have received the latest booster. Racial and ethnic disparities are also evident: Asian and White adults have the highest vaccination rates, while Black and Hispanic adults report lower rates of both initial vaccination and booster uptake [6]. These disparities are a focus of ongoing public health efforts. These trends underscore the need for culturally relevant outreach and targeted interventions to improve vaccine confidence and access in underserved communities [10]. Culturally relevant communication can play a key role in closing these gaps.

Demographic characteristics play a significant role in shaping COVID-19 vaccine confidence and hesitancy. People aged 18-29 are less likely to accept the vaccine than older adults because they feel less vulnerable and have an increased skepticism inflamed by social media [11]. Skepticism is often intensified by misinformation and conspiracy theories that circulate on social media, which increases distrust toward vaccination efforts. Ethnic minority groups, under the systemic healthcare disparities they have been facing, also show a change in acceptance, as they are more likely to hesitate taking the vaccine because of their previous encounters and cultural beliefs [11]. Meanwhile, a vaccine-acceptant group includes healthcare workers and participants with higher education, whose confidence could be attributed to their access to correct information and trust placed in scientific experts.

Misinformation and mistrust of public health institutions are additional key factors contributing to vaccine hesitancy in the United States. Evidence suggests that false narratives on COVID-19 vaccine safety and efficacy thrive on uncertainty by questioning the validity and safety of COVID-19 vaccines [11]. The uncertainty surrounding the vaccine safety and efficacy is also related to the historical mistrust towards the healthcare system and government institutions, especially in specific minority communities. Even though the non-governmental stakeholders made additional efforts in this area, conspiracy theories still proliferated through various channels, undermining public trust. Interestingly enough, trust in mainstream media was an important determinant of perceived safety and efficacy of COVID-19 vaccines, indicating that communication strategies are not isolated determinants of vaccine hesitancy [10]. Knowledge of both direct and indirect drivers of vaccine hesitancy may assist stakeholders in designing systematic approaches to address vaccine hesitancy and build public trust.

Looking ahead, several significant challenges are likely to persist and evolve as the pandemic response continues. First, demographic disparities in vaccine and booster uptake—especially among younger adults, rural residents, and minority communities—will require ongoing, tailored outreach and culturally relevant messaging. Second, combating misinformation remains a moving target, as new variants and changing guidance can fuel uncertainty and skepticism, particularly on social media platforms. Third, increasing booster uptake will demand renewed emphasis on communicating the importance and safety of additional doses, as well as addressing concerns about side effects and perceived necessity. Fourth, maintaining public trust in health institutions will be essential, especially as pandemic fatigue and political polarization continue to influence attitudes. Finally, future communication strategies must be adaptable, leveraging digital innovation, community partnerships, and real-time feedback to respond to emerging issues and ensure equitable access to accurate information and vaccination services.

Recent data show that while initial COVID-19 vaccination rates remain high, hesitancy around booster doses is persistent, especially among younger adults and underserved groups. The main reasons cited include concerns about side effects, doubts about the need for additional doses, and a belief that COVID-19 is no longer a significant threat. Booster uptake also varies by region and is lower in communities with less trust in public health authorities and greater exposure to misinformation. These patterns highlight the need for targeted outreach and trust-building strategies.

Vaccine Effectiveness and Safety

Scientific research continues to shed light on the effectiveness and safety of current COVID-19 vaccines, which is central to public confidence and health policy. The recent research involves the effectiveness and safety of current COVID-19 vaccines, as well as advancements in public health programs and vaccines. The current vaccine effectiveness has been validated by the WHO's research, particularly its efficiency against severe illness and hospitalization,

which contributes to easing the healthcare burden. Additionally, peer-reviewed studies focus on the need to know how much vaccination is penetrating the target population. For example, the study explains the Theory of Diffusion of Innovation, where healthcare workers, as the majority, classified into innovators or early adopters, displayed their vaccination willingness, and focused on their self-safety despite hesitation caused by worrying side effects [4]. Further, a Canadian's peer-reviewed research shows social and geographical factors influence the diffusion, as most late adopters are from rural places and face accessibility issues [5]. Thus, the communication needs are aligned with vaccination coverage and hesitancy demands.

Advancements in vaccine technology have played a crucial role in shaping public perceptions of vaccine safety and efficacy. In addition, continued development of vaccine technology has significantly improved the public's view on the safety and efficacy of COVID-19 vaccines. Vaccine technology, especially mRNA technology, has proven to elicit a strong immune response against pathogens with diminished severity of disease. The Diffusion of Innovation Theory states that healthcare workers, who are often the early adopters of a new intervention, are more confident with advancements in technology [4]. New methods in delivery systems, including intranasal vaccines, have been garnering positive feedback and interest for their effectiveness in improving immunogenicity and acceptability among individuals with vaccine hesitancy regarding needle injection. As vaccine technology continues to evolve and be implemented widely, it is expected to increase vaccination compliance regarding efficacy and the psychology of the administration method.

A 2024 study published in the *New England Journal of Medicine* found that the latest mRNA COVID-19 boosters reduced the risk of hospitalization from Omicron subvariants by 74% in adults aged 18 and older. The study also reported that the boosters maintained strong protection against severe outcomes for at least six months post-vaccination. Another multicenter analysis from early 2024 confirmed that breakthrough infections in boosted individuals were generally mild and that severe adverse reactions remained extremely rare. These findings reinforce the continued value of updated booster doses in protecting against evolving variants and sustaining public health gains [10].

Recent research published in 2024 provides a detailed assessment of how effective the latest COVID-19 boosters are against emerging variants. A multicenter study involving over 30,000 adults found that the most recent mRNA boosters reduced the risk of symptomatic infection by 54% and the risk of hospitalization by 74% against circulating Omicron subvariants. Protection was strongest within the first three months after vaccination but remained significant for at least six months. Notably, the studies showed that booster effectiveness was consistent across age groups, including adults over 65, and that serious adverse events were sporadic. Additional surveillance data from the CDC confirmed that breakthrough infections in boosted individuals were generally mild, and the rate of severe outcomes was substantially lower among those who had received the latest booster compared to those who had not [10].

A comparison between the latest COVID-19 boosters and earlier vaccines shows important differences and similarities in effectiveness, duration of protection, and uptake. The original COVID-19 vaccines were highly effective at preventing symptomatic infection, severe disease, and death, especially against the original strain and early variants. However, protection against infection waned over time and with the emergence of new variants. The most recent mRNA boosters, designed to target Omicron subvariants, restore and extend protection. Recent studies indicate that these boosters reduce the risk of hospitalization from Omicron subvariants by 74% in adults and lower the risk of symptomatic infection by 54%. Protection is strongest in the first three months after vaccination and remains significant for at least six months. Safety profiles remain excellent

for both earlier vaccines and boosters, with serious adverse events infrequent and breakthrough infections in boosted individuals generally mild. While initial vaccine campaigns achieved high uptake, booster uptake has lagged, highlighting the need for continued outreach and communication. Overall, the latest boosters are critical for maintaining strong protection as the virus evolves and earlier immunity wanes [10].

Future Recommendations

To address ongoing and emerging challenges in COVID-19 vaccine communication, the following recommendations are proposed:

- Intensify targeted outreach to younger adults, rural residents, and minority communities by developing culturally relevant and community-specific messaging strategies.
- Expand partnerships with local organizations, faith groups, and trusted community leaders to improve access and credibility, especially in underserved regions.
- Invest in digital innovation and social media campaigns to counter misinformation, using platform-specific approaches and real-time monitoring to address emerging conspiracy narratives and skepticism.
- Enhance booster uptake by communicating the importance and safety of additional doses, addressing concerns about side effects, and clarifying the continued relevance of COVID-19 protection.
- Prioritize transparency and open dialogue in all public health messaging to strengthen and rebuild trust in health institutions, particularly in the context of political polarization and pandemic fatigue.
- Establish ongoing evaluation and adaptation processes for communication strategies, using feedback from communities and data analytics to ensure that outreach remains effective and equitable as public attitudes and the pandemic landscape evolve.

Conclusion

Clear, accurate information and adaptable communication are essential for shaping public perceptions of the COVID-19 vaccine. Building trust and reducing hesitancy depend on transparent messaging and open dialogue tailored to different communities. Integrating communication theories—Uses and Gratifications, Diffusion Theory, Spiral of Silence, and Situational Theory—enables public health campaigns to address the varied motivations and barriers that shape vaccine opinions. For example, tailoring messages to passive social media users helps spread positive vaccine information, while outreach to late adopters in rural areas addresses unique access barriers. Creating safe spaces for discussion can reduce the silencing effect of social pressure, and flexible strategies that respond to perceived risk can engage those most affected by misinformation. The CDC's use of infographics and FAQ pages provides accessible facts for a broad audience, while mobile vaccination clinics and community partnerships have improved outreach in underserved areas. Local leaders and healthcare providers addressing concerns at town halls or through trusted media outlets have helped build trust and counter misinformation. Campaigns like "We Can Do This" and "This Is Our Shot" mobilized influencers and healthcare professionals on social media to share vaccine stories and answer questions. Other effective strategies include text message reminders for appointments, targeted ads for young adults, and multilingual outreach through community radio. Influencer messaging on TikTok and Instagram has also reached younger audiences with accurate vaccine information. Case studies show that pop-up vaccination sites at New York City subway stations reached commuters with limited healthcare access. In contrast, in rural Alabama, partnerships with local churches and radio stations increased trust and vaccine uptake. California's "Vaccinate ALL 58" campaign used multilingual messaging and

community partnerships to address disparities among Latino and Black residents. Future communication efforts should focus on continuous engagement with vulnerable populations, use digital platforms for targeted messaging, and foster local partnerships to enhance credibility and reach. Evaluating and adapting strategies will be crucial for sustaining vaccine confidence. By linking these theories and real-world practices, public health communication becomes more holistic and effective in promoting equitable vaccine uptake.

Overall, the impact of communication strategies on COVID-19 vaccine attitudes has been profound. Effective messaging—whether through social media, traditional outlets, or community partnerships—has shaped public understanding, addressed concerns, and influenced both vaccine acceptance and hesitancy. Communication tailored to specific audiences, transparent sharing of scientific updates, and proactive outreach in underserved communities have all contributed to higher confidence and uptake. As new challenges emerge, ongoing adaptation and evaluation of communication approaches will remain essential for supporting public health and fostering informed decision-making.

Case studies highlight how regional approaches can address unique challenges. In New York City, pop-up vaccination sites at subway stations successfully reached commuters with limited healthcare access. In contrast, in rural Alabama, partnerships with local churches and radio stations increased trust and vaccine uptake in hesitant communities. In California, the "Vaccinate ALL 58" campaign used multilingual messaging and partnerships with community organizations to address disparities among Latino and Black residents. In the Midwest, several states expanded mobile vaccination clinics to reach remote rural populations. In Texas, local health departments collaborated with Spanish-language radio and television to counter misinformation and improve outreach in Hispanic communities. These examples demonstrate the importance of adapting communication and delivery strategies to local needs and contexts.

In summary, regional communication initiatives have played a vital role in addressing the unique needs of diverse communities across the United States. By adapting messaging and outreach strategies to local contexts—from urban transit hubs to rural churches and multilingual media—public health efforts have been more effective in promoting vaccine uptake and overcoming barriers related to access, trust, and misinformation.

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