



Overview of Barriers and Facilitators in COVID-19 Vaccine Outreach

As the nation responds to the Coronavirus Disease of 2019 (COVID-19) pandemic, this report provides an overview of lessons learned from vaccine programs, presents evidence on COVID-19 vaccine outreach, and discusses several examples of programs that could serve as potential models for designing new vaccine outreach strategies.

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KEY POINTS

- Recent research estimates that the U.S. COVID-19 vaccination program may have prevented roughly 279,000 deaths through May 2021.¹ Available evidence supports multipronged strategies for COVID-19 vaccine outreach and the importance of tailoring messages for specific audiences. An overview of existing initiatives identified successful examples of COVID-19 vaccine outreach strategies that were implemented as part of federal or state public health programs.
- High COVID-19 vaccination rates were found with some vaccine outreach initiatives carried out through the Federally Qualified Health Centers (FQHC's), Indian Health Service, Medicaid program, National Institutes of Health, and several state public health efforts.
- Multiple federal agencies have implemented community-based vaccination programs resulting in trends towards higher number of vaccinations. Typically, these programs are multipronged and include community and stakeholder engagement, data collection and analysis, and financial support.
- Examples of vaccine outreach innovations include new ways of using data, social media, and ways to address structural barriers such as home vaccinations through emergency medical service providers.
- Evidence-based tools for designing and implementing successful vaccine outreach programs are freely available from government agencies, professional societies, and non-profit organizations.

INTRODUCTION

Fewer than nine months after the FDA's emergency use authorization (EUA) of three vaccines to prevent COVID-19, many cities, states, and communities have achieved high COVID-19 vaccination rates.² Recently, the FDA granted full approval to one of these three vaccines.³ All persons ages 12 and older living in the United States, regardless of immigration status or whether they have health insurance, are eligible to receive

COVID-19 vaccines free of charge because of funding provided by the federal government⁴ Vaccine administration is widely available through multiple means including mass vaccination sites, community health clinics, nursing homes, primary care settings, and pharmacies. These efforts have led to significant reductions in the number of COVID-19 cases, emergency department visits, hospital admissions, and deaths,⁵ and there is growing real-world evidence of the effectiveness of COVID-19 vaccines⁶⁻⁸ Serious adverse events associated with vaccination are rare and the current evidence shows that benefits for COVID-19 vaccination outweigh potential risks for most people 12 years and older.⁹

Nevertheless, some communities still experience low vaccination rates and challenges with vaccine hesitancy. Approximately sixty percent of the U.S. population over 12 years of age was fully vaccinated by August 21, 2021, but that percentage varies by state from a low of 43 percent to a high of 76 percent.¹⁰ Furthermore, HHS recently announced a plan to begin offering COVID-19 booster shots beginning the week of September 20, 2021, and starting after 8 months of an individual's second dose, pending appropriate regulatory evaluation and decision.¹¹ The expanding evidence of vaccine safety and effectiveness, combined with the increase in cases and rise of circulating variants, underscores the importance of ongoing vaccine outreach initiatives.

Vaccination for the prevention of infectious diseases is one of the great public health achievements of the 20th century and has saved millions of lives and billions of dollars annually.¹² Due to vaccinations, the world has successfully eradicated or nearly eradicated diseases like smallpox and significantly reduced the number of measles, mumps, and rubella infections. However, despite these successes, willingness to be vaccinated varies among individuals and groups based on a variety of factors including individual beliefs about vaccine safety and efficacy. Notably, vaccine hesitancy – or *the delay in acceptance or refusal of vaccines despite availability of vaccination services*¹³ – has been found with every FDA-approved vaccine¹⁴ and also observed among some health care providers.¹⁵ The reasons for vaccine hesitancy are multifactorial¹⁶ and consequently successful vaccine outreach campaigns usually involve multi-faceted strategies. Effective outreach programs increase vaccine confidence and improve vaccination rates in a community. Evidence suggests that there is greater efficacy in outreach program that involve the community.¹⁷ A safe, effective, comprehensive vaccination campaign is part of the national strategy for the COVID-19 response and pandemic preparedness.¹⁸

Recent research estimated that the COVID-19 vaccine rollout may have prevented 1.25 million hospitalizations and 279,000 deaths as of June 2021.¹ Another recent research study using a different methodology estimated that the U.S. vaccination campaign may have prevented over 139,000 COVID-19 deaths (by the end of spring on May 9, 2021).¹⁹ While research on the effectiveness of different COVID-19 vaccine outreach strategies is ongoing and the literature is still far from definitive, studies of past vaccine outreach interventions suggest best practices that are being successfully applied and expanded to develop new COVID-19 vaccine outreach programs. In most cases, the COVID-19 outreach programs that show indications of success employ various evidence-based strategies that have been adapted for COVID-19 outreach.

This report provides an overview of lessons learned from vaccine programs before the COVID-19 pandemic, including findings about general barriers to vaccination; describes the evidence on vaccine outreach; and discusses several examples of COVID-19 outreach strategies that could serve as potential models for others to adapt. It aims to identify best practices that can be used to inform COVID-19 outreach in places that have low vaccination rates. Finally, the report references a variety of online tools and resources that can assist with the design of vaccine outreach initiatives.

LESSONS FROM OTHER VACCINATION CAMPAIGNS

Barriers to Vaccination

Experience from prior infectious disease outbreaks and pandemics has identified a large array of barriers that can interfere with vaccine uptake, resulting in worsened disease control. These barriers can be broadly divided into two categories.²⁰

- **Structural barriers:** Systemic issues may limit the ability of individuals to access vaccinations. Common structural barriers include the cost of the clinical visit and vaccine; physical access including geographic and functional proximity to vaccines; limited job flexibility or caregivers of children or older adults unable to take time off in order to be vaccinated; and supply chain disruptions such as constraints on the production, distribution, and delivery of vaccines.
- **Attitude related barriers:** Individuals' beliefs or perceptions may also reduce their willingness to seek out or accept vaccination. These barriers include low perceived risk of contracting the disease or its severity; lack of trust towards vaccines, regulatory agencies that monitor vaccine development and distribution, healthcare workers who deliver vaccines, or companies that develop and produce vaccines; skepticism surrounding the need for or use of the data collected related to the administration of vaccinations (e.g., address, ID, insurance forms); misinformation that creates fear and uncertainty around vaccines; misconceptions due to lack of knowledge about vaccines and vaccine recommendations; and past experiences with other vaccines. Vaccine attitudes may be seen on a continuum, ranging from total acceptance to complete refusal, with vaccine-hesitant individuals, who may be persuadable depending on the circumstances, somewhere in between.

Interwoven within these two categories of barriers are factors related to racially and ethnically diverse communities that have historically been disproportionately affected by disasters and public health emergencies in the United States, including COVID-19. Limited English proficiency, cultural differences, and distrust in government are among these factors that define the distinct needs of these communities to overcome vaccine barriers.²¹

The World Health Organization's Strategic Advisory Group of Experts on Immunization reviewed vaccine hesitancy definitions and concluded in their report that vaccine hesitancy is complex and driven by multiple factors.²² One intuitive framework for vaccine hesitancy is the "3Cs" model:

Complacency	Low perceived risk of vaccine-preventable diseases, so vaccination is not deemed necessary and other health issues may be a higher priority.
Confidence	Low levels of trust in vaccines, the delivery system, or health authorities. This may include doubts about vaccine efficacy, motivations of policymakers, or mistrust rooted in a history of unethical public health practices.
Convenience	Barriers related to physical availability of vaccines, geographic accessibility, affordability, and acceptability of services.

Understanding the wide range of factors leading to vaccine hesitancy is key for developing and implementing effective solutions to increase vaccine demand and ensure a rapid, equitable rollout of COVID-19 vaccines.

Effective Vaccine Interventions

A recent study published by Mayo clinic²³ reinforced the importance of a multipronged and concerted approach of implementing evidence-based strategies at the organizational, interpersonal, and individual levels to improve population acceptance of COVID-19 vaccination. Although it remains vital that health care professionals communicate effectively by using the right words, the right messengers, and the right methods to reach diverse audiences, combining multiple strategies that also engage the communities in addressing different barriers is generally the best approach. Strategies increasing vaccination uptake include interventions that directly impact clinician behavior, clinic and public health processes, patient behaviors, and policy.

Currently, there is limited evidence on which interventions have been most successful in increasing COVID-19 vaccinations. As more data is being gathered, different frameworks and methods such as Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM)²³ may be used to better assess the impact of these innovative interventions at both individual and organizational (i.e., delivery agent) levels. In addition, more studies are needed to better understand and address misinformation, distrust, and hesitancy regarding COVID-19 vaccines, especially in populations at increased risk for morbidity and mortality due to long-standing systemic health and social inequities across the lifespan.

EXAMPLES OF PROMISING AND INNOVATIVE COVID-19 VACCINATION OUTREACH STRATEGIES

The COVID-19 pandemic has prompted governments and organizations to leverage existing practices with promising outcomes as well as think creatively in implementing new approaches to accelerate the adoption of the vaccines. While the pieces of evidence on the effectiveness of COVID-19 vaccination outreach strategies are still building, there are numerous examples of strategies currently being used at the federal, state, and local levels, with preliminary evidence of success in many settings. This section highlights some promising and emerging innovative outreach approaches that have the potential to improve access to and increase uptake of COVID-19 vaccines.

Leveraging Data Infrastructure for Outreach and Support

Studies and reports have documented that a data-driven approach can help inform vaccination programs, improve access, and address disparities.²⁴⁻²⁷ HHS agencies have published data resources related to vaccination and COVID-19 risk-related data to inform targeted outreach efforts. For example, the Office of the Assistant Secretary for Planning and Evaluation (ASPE) has published reports and detailed public-use files on vaccine hesitancy rates at the state, county, and local levels, with frequent updates to assist public and private efforts to improve outreach.²⁸⁻³⁰ Several states have partnered with national health insurance providers for data and analytical support to inform proactive outreach activities and responsive services (addressing structural barriers) through the Vaccine Community Connectors (VCC) program.³¹ For example, in Illinois, the state partnered with health plans to aggregate data for its population to identify and help senior members and Medicaid managed care members who live in the top 25% Social Vulnerability Index (SVI) tracts get vaccinated. The health plans also assisted members in securing appointments and coordinating transportation services. Another example is the collaborative approach in North Carolina. The state used maps with data on vaccination rates overlaid with SVI data to identify and encourage local providers to serve as vaccine providers and to inform local community organizations where to focus outreach activities.³² Educational institutions and industry partners (e.g., health IT solution provider) also produced additional publicly available data resources (e.g., aggregated dashboard,³³ vaccination prioritization index³⁴) to aid local governments and communities in tracking and planning vaccine distribution and outreach.

Maximizing Media Channels for Outreach

The use of media channels (e.g., television, radio, direct mail, newspaper, social media) has shown different degrees of acceptance and impact in improving public health knowledge and in influencing positive behaviors.^{35,36} Although these media channels have been a valuable tool to disseminate accurate information during the COVID-19 pandemic, these platforms also became sources of misinformation that contributed to individuals' hesitancy in getting vaccinated.³⁷ To counter misinformation and disinformation,^{*} federal and state governments, health systems, and service delivery partners (e.g., pharmacy chains) have launched a series of mass media campaigns.^{38,39} For example, HHS launched the "[We Can Do This](#)"⁴⁰ multimedia campaign to increase confidence in COVID-19 vaccines and reinforce basic prevention measures. The campaign developed tools and sharable resources to provide the latest updates on vaccine science, reinforce the safety of the COVID-19 vaccine, and address common misconceptions about the vaccine.⁴⁰ Another large national campaign called "[It's Up To You](#)" aims to make the public feel confident about the vaccine by providing the latest and accurate information, normalizing hesitancy, and answering important questions.⁴¹ The initiative is led by the Ad Council in collaboration among more than 300 major brands, media companies, community-based organizations, faith leaders, medical experts, and other trusted messengers. Following scientific guidance from CDC, the campaign uses vaccination data to target its audience (mostly among the racial and ethnic minority groups who are disproportionately impacted by the pandemic) and uses different creative messaging content that are culturally resonant, published in multiple languages, and distributed through different platforms (e.g., TV, radio, websites, and social media).⁴²

Aside from traditional media, online social networking platforms are also used for communicating crucial messages during public health emergency.⁴³ While evidence on the impact of social media use for vaccine outreach programs is preliminary,⁴⁴ a number of studies have demonstrated its potential to increase intention to get vaccinated.^{45,46} Recognizing the potentials of social networking platforms for influencing behavior and for reaching a wider audience, state health departments and local organizations launched social media campaigns as part of the pandemic response. For example, a Facebook campaign sponsored by an international humanitarian organization has reached 1.44 million people in low vaccine acceptance states in about a month of implementation. The campaign highlighted the importance of targeted messaging to change perceptions about the vaccine. The organization's evaluation has shown that people who saw their content are 1.5 percentage points more likely to see the vaccine as effective and 1.2 percentage points more likely to perceive that the vaccine is important in preventing the spread of the virus.⁴⁷ When the Pfizer vaccine was originally authorized for 12-17 year-olds, campaigns on social media further intensified, given that this population uses social media platforms heavily. According to a news report, the White House recruited influencers and celebrities to spread accurate information and influence the audience to get vaccinated.⁴⁸ The "[See Friends Again](#)" on TikTok[†] is an example of a campaign implemented by grassroots organizations. The campaign partnered with content creators from minority groups to help ease apprehensions about the vaccine among the communities of color.⁴⁹ Using the same platform, a state public health department launched a contest to encourage vaccination among young people before students go back to in-person learning.⁵⁰

Like some of the traditional media, social media has also been a common vehicle for vaccine-related misinformation and disinformation. In July 2021, the Office of the Surgeon General released an [advisory](#) that defines recommended action items that individuals and the whole community can do to collectively confront

^{*} Misinformation is "information that is false, inaccurate, or misleading according to the best available evidence at the time." Disinformation on the other hand is knowingly or "intentionally spreading misinformation to serve a malicious purpose, such as to trick people into believing something for financial gain or political advantage." ([The U.S. Surgeon General's Advisory on Building a Healthy Information Environment](#))

[†] TikTok is a social networking service that allows users to create and share 15-second videos. In August 2020, TikTok has more than [100 million active users](#) in the US. Research published in April 2021 by the [Pew Research Center](#) shows that 48% of U.S. adults between 18-29-years-old use TikTok. Another [consumer trend survey](#) showed that 41% of TikTok users are aged between 16 and 24.

misinformation about the COVID-19 pandemic using offline means and mass media, and technology platforms.⁵¹

Addressing Structural Barriers

Structural barriers (e.g., time, transportation, cost, and clinic or vaccine site location) continue to be a problem for many vaccination programs. Studies have found that addressing these barriers can improve vaccine coverage among different population groups.⁵²⁻⁵⁵

- **Cost barriers**

The federal government invested in the development and procurement of the COVID-19 vaccine to ensure that vaccines are offered to everyone who is recommended to receive it for free, regardless of insurance status and without cost-sharing.^{56, 57} However, concerns about paying an out-of-pocket cost to get the vaccine still exist.⁵⁸ This underscores the need for ongoing messaging and outreach.⁵⁹ Examples of current efforts include continued outreach to providers and patients with clear messaging that the vaccines are offered free of charge on vaccine registration websites and also at vaccination locations.^{60, 61} To also address costs associated with transportation, the Federal government partnered with ride-sharing companies to offer free rides to individuals going to vaccination clinics to get a shot.⁶²

- **Physical Barriers**

Homebound individuals, such as older adults, people with chronic conditions, and people with disabilities, face numerous unique challenges in accessing COVID-19 vaccines (e.g., scheduling, transportation, need for a caregiver to go with them, and provider's location). Recognizing these challenges, programs are being implemented to target and reach individuals for whom traveling to a vaccination location is difficult. For example, the integration of Emergency Medical Services (EMS) and paramedic providers in vaccination programs has greatly expanded outreach and vaccination services.⁶³ In some states, EMS personnel have been mobilized to supplement pharmacy-based vaccination by delivering vaccines to homebound individuals and those in long-term care facilities.⁶⁴⁻⁶⁶ A medical center also partnered with the local fire department to ensure that people who could not leave their residence were able to get vaccinated.⁶⁷ The Centers for Medicare & Medicaid Services (CMS) is also incentivizing providers by paying an additional \$35 per dose of vaccine administered at a Medicare beneficiaries' home, increasing the total payment amount to \$75 per dose.⁶⁸

Outreach efforts are also targeting people experiencing homelessness because of elevated risks from COVID-19 and vaccination access barriers. For example, a university hospital organized a street medicine team to provide health services to the homeless, including COVID-19 vaccination.⁶⁹ Reports on success in vaccinating persons experiencing unstable housing suggest that having vaccination workers stationed in shelters, training non-clinical outreach workers to counsel individuals, and close coordination and open communication with various community leaders and partners can help increase uptake of the vaccine among this population.⁷⁰

- **Increasing Vaccination Opportunities**

Learning from previous experiences in vaccine programs, increasing the number of accessible and convenient locations (including alternate and non-traditional locations) can increase vaccination coverage,⁷¹⁻⁷³ address equity concerns,^{74, 75} and can be a cost-effective intervention⁷⁶ in increasing

uptake of vaccines. Federal partnership programs with pharmacies have helped increase access points for vaccination around the country. These programs are further highlighted in the next section. West Virginia has also been utilizing pharmacies for COVID-19 vaccination but took a slightly different approach. During the early stage of vaccine rollout, the state used the nearly 250 independent pharmacy networks in the state to vaccinate residents of long-term care facilities and nursing homes. Local pharmacies used their existing relationships with nursing homes to gather information and leveraged the trust of patients in encouraging them to get vaccinated. This approach resulted in West Virginia being the first state to be able to offer vaccinations to all nursing home residents.⁷⁷

Aside from pharmacy partnerships, mobile vaccination initiatives and pop-up clinics can also be used to reach specific populations, especially those in underserved areas.⁷⁸⁻⁸⁰ Many states are using mobile vaccination clinics to increase coverage. Arizona used this approach in rural areas, along with other interventions; the state reached 59% of vaccination coverage in rural areas, which is substantially higher than the national average of 38.9% (as of April 10, 2021).⁸¹ A related approach is to offer drive-through services as a convenient way to get vaccinated.⁸² The experience of a health system based in Colorado proved that well-planned, coordinated, and efficient drive-through vaccination events could yield a successful mass uptake of vaccines. For example, this health system's 2-day weekend event resulted in successful vaccination of 10,000 people at over 830 people an hour.⁸³ States also partner with employers for workplace vaccination programs to further increase vaccination opportunities for employees and their families through on-site vaccination clinics and mobile vaccination buses for large work places (e.g., factories and food processing).⁸⁴⁻⁸⁶

EXAMPLES OF HHS SUPPORT FOR COVID-19 VACCINATION PROGRAMS

HHS is coordinating the federal vaccination effort that has been implemented by the Centers for Disease Control and Prevention (CDC) with contributions from agencies across the Department and in partnership with health centers, clinical providers, and community members. The following discussion includes a brief description of the CDC COVID-19 vaccination program and illustrative examples from initiatives under this program as well as other outreach activities in support of the federal vaccination effort.

Centers for Disease Control and Prevention

The Centers for Disease Control and Prevention (CDC) COVID-19 Vaccination Program was implemented in the fall of 2020 and has been an unprecedented effort to vaccinate hundreds of millions of Americans against SARS-CoV-2, the virus that causes COVID-19 disease.⁸⁷ The U.S. government has distributed COVID-19 vaccine doses nationwide and enrolled providers across the nation. The U.S. government also provided publicly funded adjuvant, syringes, needles, or other constituent products and ancillary supplies as set forth in the COVID-19 Vaccination Program Interim Playbook for Jurisdiction Operations.⁸⁸

There are multiple components of the CDC COVID-19 Vaccination Program, including the Long-Term Care Pharmacy Partnership,⁸⁹ the Federal Retail Pharmacy Program,⁹⁰ Memoranda of Agreement between CDC and other federal agencies to vaccinate their staff and populations they serve, vaccination at health centers and rural health clinics coordinated by CDC and the Health Resources and Services Administration (HRSA),⁹¹ and distribution to dialysis centers to hold vaccination clinics for their patients.⁸⁷ Providers also may enroll in the CDC COVID-19 Vaccination Program through their state, territorial, tribal, or local health department. The only way to legally access COVID-19 vaccine is through enrollment as a provider in the CDC COVID-19 Vaccination Program and to sign the CDC Provider Agreement.⁹²

Health Resources and Services Administration

The Health Resources and Services Administration (HRSA) is the primary federal agency within HHS tasked with combatting health disparities and promoting health equity for underserved, geographically isolated, and medically vulnerable populations. In FY 21, under the American Rescue Plan Act (ARP), HRSA received over \$10 billion to support COVID-19 activities, including vaccinations. Below are examples of how HRSA programs have played a role in supporting vaccination efforts for underserved and rural communities across the country.

Federally Qualified Health Centers

Federally qualified health centers (FQHCs) are woven into the fabric of their communities and provide equitable medical care and resources to underserved populations. As trusted sources of information and primary care services,⁹³ they partner with other local, community-based, and faith-based organizations to encourage COVID-19 vaccinations. HRSA provided grants and other support to FQHCs and engaged them at the start of the public health emergency (PHE) to bolster their COVID-19 response. There are approximately 1,400 HRSA-funded centers⁹¹ delivering high-quality affordable care annually to nearly 29 million low-income patients, of whom approximately 63% are people of color. Through ARP funding, HRSA has awarded or announced the availability of approximately \$7.6 billion to support the FQHC community,⁹⁴ including \$32 million to support COVID-19 training and technical assistance.⁹⁵ In addition, 102 look-alike health centers (LALs) that are not federally funded were granted \$144 million for the COVID-19 response.^{95,96}

As part of the COVID-19 response, FQHCs submitted data to HRSA on testing, vaccination, and outreach, as well as impact on patients and staff and capacity (e.g., resources, technical assistance, training). According to a HRSA summary report, 62% of FQHCs are conducting community outreach for COVID-19 vaccinations through mobile vans, pop-up clinics, and school-based clinics.⁹⁷ FQHC networks are also exploring strategies such as “walk-up” and “drive thru” sites after their success with these strategies for COVID-19 testing efforts.⁹⁸

During early 2021, to ensure our nation's underserved communities and those disproportionately affected by COVID-19 are equitably vaccinated against COVID-19, HRSA and CDC launched an effort that allocated vaccines directly to health centers in three phases, first inviting 250 health centers to participate, then expanding participation to an additional 700 health centers. On April 7, 2021, the invitation was then extended to all HRSA-funded health centers and LALs, expanding the opportunity to 1,470 health centers nationwide. Through this effort, more than 6 million vaccinations were provided by health centers participating in the Health Center COVID-19 Vaccine Program. More broadly, more than 14 million doses of COVID-19 vaccine have been provided by health centers, 66 percent of these provided to people of color.⁹⁹

Rural Health Clinics and Community-Based Workforce

Rural Health Centers (RHCs) are often the primary safety-net provider in medically underserved rural communities, with over 4,600 locations across the country. In July 2021, HHS announced nearly \$100 million in ARP funding for nearly 2,000 RHCs to support outreach efforts to increase vaccinations and build vaccine confidence in rural communities.¹⁰⁰ In addition, HHS is also directly allocating COVID-19 vaccines to RHCs and currently has more than 110 RHCs across 22 states have received a total 75,870 vaccine doses.¹⁰¹

In May 2021, HHS also announced the availability of nearly \$250 million across two funding opportunities to develop and support a community-based workforce to serve as trusted messengers sharing information about vaccines, increase COVID-19 vaccine confidence, and address barriers to vaccination for individuals living in vulnerable and medically underserved communities. These organizations are using strategies tailored to the populations and areas they know best to address persistent racial, ethnic, and socioeconomic health inequities.^{102, 103}

Indian Health Service

In March 2020, the Indian Health Service (IHS) leadership activated the Headquarters Incident Command Structure (ICS) to respond to COVID-19. On September 4, 2020, the ICS approved the IHS COVID-19 Vaccine Task Force to lead the Agency's COVID-19 vaccine activities. The IHS COVID-19 Vaccine Task Force comprised of six teams: 1) prioritization, 2) distribution and allocation, 3) vaccine administration, 4) communication, 5) data management, 6) safety and monitoring engaged Indian tribes through consultations and listening sessions to create and refine the IHS COVID-19 Pandemic Vaccine Plan (November 2020).¹⁰⁴

This approach led to early successes in vaccination. By March 2021, American Indian and Alaskan Natives accounted for 1.6 percent of total vaccinations administered, more than double their share of the population (0.7 percent).¹⁰⁵ However, there was variation in vaccination coverage —the proportion of a given population that has received at least one dose of the COVID-19 vaccine —within a state.¹⁰⁶ IHS received over \$9 billion¹⁰⁷ and distributed over 1.8 million vaccine doses to 354 IHS-operated, tribal health programs, and urban Indian organizations across the health care system. In addition, 1.5 million doses of the COVID-19 vaccine have been administered to patients, staff, and tribal community members through early August 2021.^{10, 104, 107, 108} The successful vaccination rate among Indian tribes has been attributed to their tribal leadership and community-centered approach when conducting outreach, such as call centers staffed with people who speak the same language, and messaging through both traditional sources (e.g., direct mail, phone calls, radio) and social media.¹⁰⁹

Centers for Medicare and Medicaid Services – Medicaid

Under the American Rescue Plan Act (ARP), enacted in March 2021, states are required to reimburse COVID-19 vaccines and vaccine administration for Medicaid and CHIP beneficiaries without cost-sharing. Federal funding will continue to reimburse all COVID-19 vaccine expenses and vaccine administration for Medicaid and CHIP at 100 percent Federal Medical Assistance Percentage and will be extended one-year post-PHE.¹¹⁰

On May 28, CMS issued an [informational bulletin](#) regarding the expansion of the COVID-19 vaccine to adolescents age 12 and over.

In addition, numerous state Medicaid agencies reported they conducted outreach to their beneficiaries citing specific strategies including¹¹¹:

- Asking Medicaid Managed Care Organizations (MCOs) to adopt a community health worker model¹¹² to assist vulnerable populations (e.g., individuals with disabilities or experiencing homelessness). In this model, frontline workers, usually from the community, provide health education and connect individuals to services.
- Partnerships with retail pharmacies.
- Encouraging vaccination among Emergency Medical Technicians (EMT) drivers and EMT assistance with transportation to vaccination sites.
- The Connecting Kids to Coverage (CKC) Campaign, which focuses on enrolling and retaining eligible children in Medicaid and CHIP, has incorporated promoting the COVID-19 vaccine as part of its messaging in a variety of activities including a Back to School Initiative. In June, a webinar for community-based organizations, schools, providers, grantees, and advocates featured a CDC presentation on the importance of getting the COVID-19 vaccine for adolescents. This messaging has also been incorporated into an electronic newsletter to partner organizations and a Radio Media Tour scheduled for early September.¹¹³

CMS's Medicaid COVID-19 Vaccine Toolkit¹¹⁴ outlines other options for states to consider with respect to both practitioner and facility-based billing for vaccine administration services, such as enhanced rates or add-on payments (including the possibility of an add-on payment for drive-through immunization sites). To further encourage vaccination uptake, CMS issued a rule in May 2021¹¹⁵ for long-term and residential facilities to monitor and report vaccinations and offer COVID-19 education to people with intellectual disabilities.¹¹⁶ CMS Center for Clinical Standards and Quality (CCSQ) and CDC held a series of calls targeted to nursing home staff that were vaccine hesitant or vaccine resistant to encourage vaccine uptake within staff by highlighting the Long Term Care Vaccine Community Champions.¹¹⁷

National Institutes of Health Community Engagement Alliance Against COVID-19

In order to further study educational strategies, knowledge, and perceptions regarding the COVID-19 virus and vaccines in communities hardest hit by the pandemic, the National Institutes of Health (NIH) is leveraging its existing community-engaged research networks¹¹⁸⁻¹²⁰ and among community-engaged scientists to address COVID-19 disparities through community engagement (e.g., community-based organizations, FQHCs), outreach, and a centralized location for science-based COVID-19 related information. The mission for the NIH NIH Community Engagement Alliance (CEAL) Against COVID-19 Disparities is *“to provide trustworthy information through active community engagement and outreach to the people hardest-hit by the COVID-19 pandemic, with the goal of building long-lasting partnerships as well as improving diversity and inclusion in response to COVID-19.”*¹²¹

The CEAL teams are in states across the U.S., including Puerto Rico. These teams engage with trusted organizations and leaders within community-engaged networks to that build trust, provide accurate information on COVID-19, promote, encourage inclusive participation in COVID-19 research, and public health mitigation strategies (including vaccines), improve access to emerging therapies to reduce disparities. Strategies under testing include development and dissemination of newly created information and messages tailored to communities, innovative approaches for outreach at the local level, and partnering with hyperlocal media and social media channels. The CEAL website's "Engagement Spotlights" provide examples of how the CEAL teams are tailoring their approach to the unique communities they serve.¹²²

Office of Minority Health National COVID-19 Resiliency Network and Advancing Health Literacy to Enhance Equitable Community Responses to COVID-19 Initiatives

To support the development and dissemination culturally and linguistically appropriate COVID-19 information and connection to COVID-19 services (e.g., testing, vaccination) for racial and ethnic minority populations, the HHS Office of Minority Health (OMH) funded a \$40M National COVID-19 Resiliency Network of national, state, territorial, tribal and local stakeholders.¹²³

To increase vaccination and other COVID-19 mitigation measures (e.g., testing, contact tracing, public health prevention practices) in racial and ethnic minority and other socially vulnerable populations, OMH funded 73 local governments for a total of \$250M for the Advancing Health Literacy to Enhance Equitable Community Responses to COVID-19 initiative. The initiative seeks to demonstrate the effectiveness of local government implementation of evidence-based health literacy strategies that are culturally appropriate.¹²⁴

EXAMPLES OF STATE COVID-19 VACCINATION OUTREACH INITIATIVES

As of August 21, 2021, 21 states, the District of Columbia, Puerto Rico, and Guam have reached over 70 percent of the population (12 years or older) who received at least one dose of vaccine, and eight states have achieved vaccination rates over 80 percent.¹⁰ Nevertheless, the percent of the population 12 years and older

in states who are fully vaccinated is lower and at least 11 states have 50 percent or less of the eligible population fully vaccinated. States have used multiple types of outreach strategies,¹²⁵ including many that focus on achieving equitable access to vaccines particularly by communities disproportionately affected by the pandemic.¹²⁶ This section highlights illustrative state outreach strategies in four states that were chosen based on having information available about their strategies from the health sciences literature, news reports, or on a public website sponsored by the respective state. Many other states are also incorporating successful strategies, and therefore this list is by no means comprehensive:

Maine

Maine has one of the highest vaccination rates in the nation. Eighty percent of the population 12 years or older are vaccinated in Maine with at least one dose of the vaccine.¹⁰ This is particularly noteworthy because of the outreach challenges it faces with 40 percent of the population living in a rural county¹²⁷ and 18 percent of the population over the age of 65.¹²⁸ As a result, Maine is considered the most rural state in the nation and the oldest state by median age.¹²⁷ In addition, access to affordable and reliable forms of transportation is often problematic.^{128,8} In Maine, health systems' roles in leading and mobilizing community partners have been critical components of the state's successful outreach strategy.¹²⁹

Components of Maine's vaccine outreach strategy include:¹²⁹

- Large integrated health systems partnering with community-based organizations, employers, and the state to set up mass vaccination sites.
- Clinical and nonclinical health system employees volunteering to work at vaccine clinics including staff who work in community health, finance, billing, and administration.
- Repurposing physical property resources like a closed horse racing track, a town's recreation department, and a YMCA to establish high throughput vaccine clinics.
- Partnerships with employers and community organizations, some of whom allowed their employees to volunteer as part of their workday.
- Hosting virtual town halls in several languages.
- State funding to community-based organizations to assist with outreach and education.

New Jersey

New Jersey has achieved high levels of vaccination,¹⁰ which may be partially attributable to its vaccination plan that focuses on providing equitable access, achieving community protection, and build sustainable trust.¹³⁰ Eighty percent of the population 12 years or older are vaccinated in New Jersey with at least one dose of the vaccine.¹⁰ It has taken a multipronged approach to its vaccination outreach including initiative such as:

- Working with Medicaid managed care organizations to identify unvaccinated individuals who are eligible for vaccines due to their health status. The insurance companies then mount "high touch" outreach through telephone calls and mailings to Medicaid beneficiaries. The insurance representatives work with beneficiaries to schedule a vaccine appointment and help with transportation if needed.¹³¹
- Supporting the COVID-19 Community Corps (CCC) initiative, which trains community members to educate and deliver COVID-19 vaccination information and navigation support to underserved communities.¹³²

- Providing on-site vaccinations in public housing complexes for seniors and setting up field vaccination sites on farms employing migrant and seasonal workers.¹³³

Minnesota

Minnesota is a state with growing racial and ethnic diversity and an aging population, but a higher rate of health insurance coverage compared to the U.S.¹³⁴ The state's COVID-19 vaccination plan¹³⁵ calls for a broad public information campaign and using existing relationships with community organizations to reach key audiences with information about COVID-19 vaccine. Seventy-two percent of the population 12 years or older are vaccinated in Minnesota.¹⁰ Some vaccine outreach initiatives in Minnesota are:

- The Minnesota COVID-19 Vaccine Connector, which is a tool that helps Minnesotans find out when, where, and how to get a COVID-19 vaccine.¹³⁶
- The state's 'Vax to School' campaign encourages students and families to get fully vaccinated by the beginning of the school year.¹³⁷ The campaign included a [video on YouTube of Minnesotan educators](#) encouraging students and families to get vaccinated to ensure a safe school year.
- The state health department provides funding for community groups to host community COVID-19 vaccination events, including recruiting people to attend, providing transportation, and helping with registration.¹³⁸
- The state public health department is sponsoring a COVID-19 community vaccination clinic at the Minnesota State Fair.¹³⁹
- The state has a "Be a Vaccine Advocate" which provides COVID-19 vaccine toolkit for individuals and organizations in multiple languages like Hmong, Somali, and Spanish¹⁴⁰
- Metro Transit turned six underutilized transit buses into mobile vaccination clinics by removing seating and installing new equipment. The mobile vaccination units are a highly-targeted vaccine distribution strategy, intended to bring vaccines to people who would otherwise have a hard time getting vaccinated due to barriers, including transportation, technology, and geographic barriers.¹⁴¹
- Outreach at places of worship including synagogues, churches, and mosques.¹⁴²
- The "Shots at the Shop" campaign, which is an effort to engage black-owned barbers and stylists and the communities they serve in COVID vaccine education and outreach.¹⁴³

North Carolina

In North Carolina, 63 percent of the population 12 years or older are vaccinated with at least one dose of the vaccine.¹⁰ In addition, the proportion of vaccinated persons who were Black and of vaccine doses administered to Hispanic persons nearly doubled during March 29–April 6, 2021 compared with December 14, 2020–January 3, 2021, due to the focus of vaccine efforts on equity.¹⁴⁴

North Carolina's COVID-19 Vaccine Roadmap¹⁴⁵ includes principles of inclusion and respect, trustworthy communication, data-driven decisions, and equitable access to vaccines. A central component of the roadmap was to embed equity in vaccine operations. This was implemented through:

- Partnerships with FQHC's.
- Providing free transportation for people to receive COVID-19 vaccines.
- Training and deploying over 400 community health workers.

- Setting aside a portion of the state’s vaccine allocation to support vaccine sites and events to reach historically marginalized populations such as African Americans and Latinos.
- Supporting partnerships with community organizations to hold vaccine clinics in churches, colleges, and community centers, serving historically underserved communities.

Another novel approach to target COVID-19 vaccine outreach was undertaken by North Carolina Cancer Hospital of the University of North Carolina. Health professionals used electronic health records to identify cancer patients eligible for vaccination and focused on communities of color and those who lived in a county with a greater than 20% poverty rate. Nurses placed scripted informational telephone calls to each identified patient to provide standardized education about the eligibility, safety, and logistics of vaccination. The focus of the calls was to assist patients in making informed decisions about vaccination, address barriers, and answer to questions. Of the 536 patients who were identified, 359 patients (67 percent) were reached successfully by phone and 93 patients (26 percent) were confirmed to receive the vaccination within about three months of the calls. In addition, 14 (4 percent) were scheduled for a vaccine appointment in three months.¹⁴⁶

COVID-19 VACCINE OUTREACH TOOLS AND GUIDES

Various outreach toolkits are available through federal, state, local, and non-profit groups to enhance community outreach and promote equitable COVID-19 vaccine coverage. These tools provide guidance to effectively target, communicate, and provide accessible services to the community at large as well as vulnerable groups that are most impacted by the pandemic.

- [ASPE](#) has provided detailed public-use files on vaccine hesitancy rates at the state, county, and local levels, with frequent updates to assist public and private efforts to improve outreach.²⁸
- [CDC](#) has toolkits to help local governments and partners in building the confidence of the community to COVID-19 vaccine, including resources to promote COVID-19 vaccine equity for racial and ethnic minority groups.¹⁴⁷
- The [CDC](#) released guidelines while [ACL](#) consolidated reference materials and recommended processes for jurisdictions and partner organizations to ensure equal opportunities for older adults and people living with disabilities to get vaccinated.^{148, 149}
- [CDC and the HHS’ OMH](#) developed the Minority Health Social Vulnerability Index (SVI) to help in the identification of racial and ethnic minority communities who are the greatest risk for disproportionate impact and adverse outcomes due to the COVID-19 pandemic.
- [CMS](#) released a tool to help state and territorial agencies implementing Medicaid, Children’s Health Insurance Program (CHIP), and Basic Health Program (BHP) in identifying and addressing issues to ensure coverage and reimbursement for vaccine administration among the programs’ beneficiaries and enrollees.¹¹⁴
- [FDA](#) published webpages with COVID-19 resources, including vaccine fact sheets, in multiple languages (e.g., Chinese, Korean, Tagalog, Portuguese, Somali).¹⁵⁰
- [HRSA](#) published a webpage for its community-based workforce outreach awardees with resources to help them address misinformation and vaccine hesitancy, and build trust with adults and minority groups, as well as data sources to help in planning.¹⁵¹
- [NIH](#) provides science-based resources, including FAQs, factsheets, and social media messages in multiple languages about COVID-19 and vaccines, to communities hit hardest by COVID-19 to assist in providing accurate information and encouraging informed action on vaccination and preventive measures.¹⁵²

- The [Surgeon General](#) released an advisory and [NIH](#) released a guide in addressing misinformation about the COVID-19 vaccine.^{51, 153, 154}

Other non-profit groups have also published toolkits to help communities in planning and executing outreach activities to increase vaccine coverage:

- The [American Psychological Association](#) and the [National Academies of Sciences, Engineering, and Medicine](#) released guidance documents engaging the community and offering ways to effectively build trust and confidence around the vaccine among the different sectors of the community.^{155, 156}
- Targeting employers, the [National Safety Council](#) released a guidance in providing information and in crafting policies that can aid in increasing the vaccine coverage among workers.¹⁵⁷
- [Public Health Institute](#) documented best practices in addressing barriers in accessing vaccines.
- The [National Rural Health Association](#) developed tools and resources to help reach and address COVID-19 questions and concerns among rural communities.¹⁵⁸

CONCLUSION

The COVID-19 pandemic has taken a staggering toll on the lives of people across the United States and around the world. The social, economic, and health risks of the pandemic are amplified in communities that have been historically underserved, marginalized, and adversely affected by persistent poverty and inequality. New vaccines to prevent COVID-19 became widely available in the United States with unprecedented speed following a rigorous review by FDA to assess vaccine safety and effectiveness. Almost universally, these vaccines provide the safest and most effective way to significantly reduce the risk of morbidity and mortality associated with SARS-CoV-2 infection. While structural and attitudinal barriers exist to COVID-19 vaccination, there are multiple examples of COVID-19 vaccine outreach strategies by federal and state public health programs that have successfully facilitated high COVID-19 vaccination rates in communities and states. Initial research suggests this success has translated into lower rates of hospitalizations and mortality due to COVID-19 in those areas.¹ Additional research and monitoring are needed to understand which components of COVID-19 vaccine outreach programs are the most effective and to inform the design of new COVID-19 vaccine outreach interventions. Nevertheless, there is an urgent need to continue current vaccine outreach efforts using innovative approaches and the best available evidence from research studies as it becomes available. Strategies that are multifaceted, engage communities, address barriers, and are evidence-based are likely to lead to higher vaccination rates.

REFERENCES

1. Galvani A, Moghadas SM, Schneider EC. *Deaths and Hospitalizations Averted by Rapid U.S. Vaccination Rollout*. Issue Brief. The Commonwealth Fund. July 7, 2021. Accessed August 13, 2021. <https://www.commonwealthfund.org/publications/issue-briefs/2021/jul/deaths-and-hospitalizations-averted-rapid-us-vaccination-rollout>
2. Centers for Disease Control and Prevention. COVID-19 Vaccinations in the United States. Accessed August 12, 2021. https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-total-admin-rate-total
3. U.S. Food and Drug Administration. FDA Approves First COVID-19 Vaccine. Accessed August 23, 2021. <https://www.fda.gov/news-events/press-announcements/fda-approves-first-covid-19-vaccine>
4. Centers for Disease Control and Prevention. COVID-19 Vaccines Are Free to the Public. Updated May 24, 2021. Accessed August 17, 2021. <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/no-cost.html>
5. Christie A, Henley SJ, Mattocks L, et al. Decreases in COVID-19 Cases, Emergency Department Visits, Hospital Admissions, and Deaths Among Older Adults Following the Introduction of COVID-19 Vaccine - United States, September 6, 2020-May 1, 2021. *MMWR Morb Mortal Wkly Rep*. Jun 11 2021;70(23):858-864. doi:10.15585/mmwr.mm7023e2
6. Moline HL, Whitaker M, Deng L, et al. Effectiveness of COVID-19 Vaccines in Preventing Hospitalization Among Adults Aged ≥65 Years - COVID-NET, 13 States, February-April 2021. *MMWR Morb Mortal Wkly Rep*. Aug 13 2021;70(32):1088-1093. doi:10.15585/mmwr.mm7032e3
7. Rosenberg E, Holtgrave DR, Dorabawila V, et al. New COVID-19 Cases and Hospitalizations Among Adults, by Vaccination Status — New York, May 3–July 25, 2021. ePub. *MMWR Morb Mortal Wkly Rep*. August 18, 2021 doi:<http://dx.doi.org/10.15585/mmwr.mm7034e1external>
8. Tenforde MW, Self WH, Naioti EA, et al. Sustained Effectiveness of Pfizer-BioNTech and Moderna Vaccines Against COVID-19 Associated Hospitalizations Among Adults — United States, March–July 2021. *MMWR Morb Mortal Wkly Rep*. August 18, 2021 doi:<http://dx.doi.org/10.15585/mmwr.mm7034e2external>
9. Centers for Disease Control and Prevention. COVID-19 Vaccines While Pregnant or Breastfeeding. Updated August 11, 2021. Accessed August 23, 2021. <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/recommendations/pregnancy.html>
10. Centers for Disease Control and Prevention. COVID Data Tracker. Accessed August 18, 2021, https://covid.cdc.gov/covid-data-tracker/#vaccinations_vacc-people-onedose-pop-pop18
11. Centers for Disease Control and Prevention. Joint Statement from HHS Public Health and Medical Experts on COVID-19 Booster Shots. August 18, 2021
12. Centers for Disease Control and Prevention. *Achievements in Public Health, 1900-1999 Impact of Vaccines Universally Recommended for Children -- United States, 1990-1998*. Vol. 48.242-248. *Morbidity and Mortality Weekly Report*. April 2, 1999. Accessed August 12, 2021. <https://www.cdc.gov/mmwr/preview/mmwrhtml/00056803.htm>
13. MacDonald NE. Vaccine hesitancy: Definition, scope and determinants. *Vaccine*. Aug 14 2015;33(34):4161-4. doi:10.1016/j.vaccine.2015.04.036
14. Savoia E, Piltch-Loeb R, Goldberg B, et al. Predictors of COVID-19 Vaccine Hesitancy: Socio-Demographics, Co-Morbidity, and Past Experience of Racial Discrimination. *Vaccines (Basel)*. Jul 9 2021;9(7)doi:10.3390/vaccines9070767

15. Lin C, Mullen J, Smith D, Kotarba M, Kaplan SJ, Tu P. Healthcare Providers' Vaccine Perceptions, Hesitancy, and Recommendation to Patients: A Systematic Review. *Vaccines (Basel)*. Jul 1 2021;9(7)doi:10.3390/vaccines9070713
16. Arvanitis M, Opsasnick L, O'Connor R, et al. Factors associated with COVID-19 vaccine trust and hesitancy among adults with chronic conditions. *Prev Med Rep*. Dec 2021;24:101484. doi:10.1016/j.pmedr.2021.101484
17. Gilmore B, Ndejjo R, Tchetchia A, et al. Community engagement for COVID-19 prevention and control: a rapid evidence synthesis. *BMJ Glob Health*. Oct 2020;5(10)doi:10.1136/bmjgh-2020-003188
18. The White House. National Strategy for the COVID-19 Response and Pandemic Preparedness. Accessed August 24, 2021. <https://www.whitehouse.gov/wp-content/uploads/2021/01/National-Strategy-for-the-COVID-19-Response-and-Pandemic-Preparedness.pdf>
19. Gupta S, Cantor J, Simon KI, Bento AI, Wing C, Whaley CM. Vaccinations Against COVID-19 May Have Averted Up To 140,000 Deaths In The United States. *Health Aff (Millwood)*. Aug 18, 2021 2021;doi:10.1377/hlthaff.2021.00619
20. Zhang Y, Fisk RJ. Barriers to vaccination for coronavirus disease 2019 (COVID-19) control: experience from the United States. *Glob Health J*. Mar 2021;5(1):51-55. doi:10.1016/j.glohj.2021.02.005
21. Andrulis DP, Siddiqui NJ, Purtle J, Cooper MR. H1N1 Influenza Pandemic and Racially and Ethnically Diverse Communities in the United States: Assessing the Evidence and Charting Opportunities for Advancing Health Equity. September 2012
22. Sage Working Group. *Report of the Sage Working Group on Vaccine Hesitancy*. Accessed August 11, 2021. https://www.who.int/immunization/sage/meetings/2014/october/1_Report_WORKING_GROUP_vaccine_hesitancy_final.pdf
23. Glasgow RE, Harden SM, Gaglio B, et al. RE-AIM Planning and Evaluation Framework: Adapting to New Science and Practice With a 20-Year Review. *Front Public Health*. 2019;7:64. doi:10.3389/fpubh.2019.00064
24. Muscoplat MH, Rajamani S. Immunization Information System and Informatics to Promote Immunizations: Perspective From Minnesota Immunization Information Connection. *Biomed Inform Insights*. 2017;9:1178222616688893. doi:10.1177/1178222616688893
25. Stern RJ, Rafferty HF, Robert AC, et al. Concentrating Vaccines in Neighborhoods with High Covid-19 Burden. *NEJM Catalyst*. April 6, 2021
26. Maravi ME, Snyder LE, McEwen LD, DeYoung K, Davidson AJ. Using Spatial Analysis to Inform Community Immunization Strategies. *Biomed Inform Insights*. 2017;9:1178222617700626. doi:10.1177/1178222617700626
27. Popovich M, Altstadter B, Popovich LH. Observations Illustrating the Use of Health Informatics to Link Public Health Immunization Registries and Pharmacies to Increase Adult Immunization Rates and Improve Population Health Outcomes. *Online J Public Health Inform*. 2016;8(2):e185. doi:10.5210/ojphi.v8i2.6398
28. Assistant Secretary of Planning and Evaluation. Vaccine Hesitancy for COVID-19: State, County, and Local Estimates. Accessed August 17, 2021. <https://aspe.hhs.gov/reports/vaccine-hesitancy-covid-19-state-county-local-estimates>

29. Centers for Disease Control and Prevention. Vaccine Hesitancy for COVID-19: County and Local Estimates. Data.CDC.gov. Accessed August 18, 2021. <https://data.cdc.gov/Vaccinations/Vaccine-Hesitancy-for-COVID-19-County-and-local-es/q9mh-h2tw/data>
30. Beleche T, Kolbe K, Bush L, Sommers BD. *Unvaccinated for COVID-19 but Willing: Demographic Factors, Geographic Patterns, and Changes Over Time*. Office of the Assistant Secretary for Planning and Evaluation. August 9, 2021. Accessed August 18, 2021. <https://aspe.hhs.gov/reports/unvaccinated-willing-ib>
31. Shrank W, Miller S. *Health Insurance Providers Leverage Data and Expertise to Improve Vaccine Acceptance in Underserved Communities*. Commentary. Accessed August 12, 2021. <https://catalyst.nejm.org/doi/pdf/10.1056/CAT.21.0153>
32. Greene K, Huber K, McClellan M. *Improving Immunization Information Sharing to Support Targeted COVID-19 Vaccination Outreach*. Duke-Margolis Center for Health Policy. Accessed August 12, 2021. <https://healthpolicy.duke.edu/sites/default/files/2021-07/Improving%20Immuniz%20Info%20Sharing.pdf>
33. Johns Hopkins University. COVID-19 Dashboard. Updated August 20, 2021. Accessed August 20, 2021. <https://coronavirus.jhu.edu/map.html>
34. JVION.Jvion Applies Clinical Artificial Intelligence to Help Prioritize COVID-19 Vaccine Distribution to Most Vulnerable Communities and Individuals. January 19, 2021, Accessed August 20, 2021. <https://jvion.com/news/jvion-applies-clinical-ai-to-help-prioritize-covid-19-vaccine-distribution/>
35. Hornik R. *Public Health Communication: Evidence for Behavior Change*. Routledge; 2002:452.
36. Bertrand JT, Anhang R. The effectiveness of mass media in changing HIV/AIDS-related behaviour among young people in developing countries. *World Health Organ Tech Rep Ser*. 2006;938:205-41; discussion 317-41.
37. Piltch-Loeb R, Savoia E, Goldberg B, et al. Examining the effect of information channel on COVID-19 vaccine acceptance. *PLoS One*. 2021;16(5):e0251095. doi:10.1371/journal.pone.0251095
38. New York Governor's Press Office.Governor Cuomo Announces Statewide Launch of "Roll up Your Sleeve" Campaign and Encourages New Yorkers Age 16-Plus Who Are Eligible for the COVID-19 Vaccine to Schedule an Appointment. April 5, 2021, Accessed August 18, 2021. <https://www.governor.ny.gov/news/governor-cuomo-announces-statewide-launch-roll-your-sleeve-campaign-and-encourages-new-yorkers>
39. Trovall E. Harris County Pushes COVID-19 Vaccine Safety Campaign To Address Community Mistrust. Houston Public Media. Updated February 4, 2021. Accessed August 18, 2021. <https://www.houstonpublicmedia.org/articles/news/health-science/coronavirus/2021/02/04/390669/harris-county-pushes-covid-19-vaccine-safety-campaign-as-community-mistrust-threatens-herd-immunity/>
40. U.S. Department of Health and Human Services. COVID-19 Public Education Campaign: We can do this. Accessed August 18, 2021. <https://wecandothishhs.gov/>
41. The Ad Council and COVID.The Ad Council and COVID Collaborative Reveal 'It's Up To You' Campaigns to Educate Millions of Americans about COVID-19 Vaccines. February 25, 2021, 2021. Accessed August 18, 2021. <https://www.adcouncil.org/press-releases/the-ad-council-and-covid-collaborative-reveal-its-up-to-you-campaigns-to-educate-millions-of-americans-about-covid-19-vaccines>
42. The Ad Council and COVID.Major brands, media companies, community-based organizations, faith leaders and other trusted messengers to extend reach of message across all channels with a focus on Black and Hispanic communities, who have been hit hardest by the pandemic. February 25, 2021,

Accessed August 18, 2021. <https://www.adcouncil.org/press-releases/the-ad-council-and-covid-collaborative-reveal-its-up-to-you-campaigns-to-educate-millions-of-americans-about-covid-19-vaccines>

43. Malik A, Khan AL, Quan-Haase A. Public health agencies outreach through Instagram during the COVID-19 pandemic: Crisis and Emergency Risk Communication perspective. *International Journal of Disaster Risk Reduction*. 2021;61(102346)doi:<https://doi.org/10.1016/j.ijdrr.2021.102346>
44. Ortiz RR, Smith A, Coyne-Beasley T. A systematic literature review to examine the potential for social media to impact HPV vaccine uptake and awareness, knowledge, and attitudes about HPV and HPV vaccination. *Hum Vaccin Immunother*. 2019;15(7-8):1465-1475. doi:10.1080/21645515.2019.1581543
45. Cataldi JR, Kerns ME, O'Leary ST. Evidence-based strategies to increase vaccination uptake: a review. *Curr Opin Pediatr*. Feb 2020;32(1):151-159. doi:10.1097/mop.0000000000000843
46. Ahmed N, Quinn SC, Hancock GR, Freimuth VS, Jamison A. Social media use and influenza vaccine uptake among White and African American adults. *Vaccine*. Nov 26 2018;36(49):7556-7561. doi:10.1016/j.vaccine.2018.10.049
47. Kirkwood J, Wilson MK. COVID-19 Vaccine Confidence: CARE Launches Pro-Vaccine Ad Campaign. Updated July 1, 2021. Accessed August 16, 2021. <https://www.care.org/news-and-stories/ideas/covid-19-vaccine-confidence-care-and-facebook-launch-pro-vaccine-ad-campaign/>
48. Lorenz T. To Fight Vaccine Lies, Authorities Recruit an 'Influencer Army'. *The New York Times*. August 1, 2021. Accessed August 24, 2021. <https://www.nytimes.com/2021/08/01/technology/vaccine-lies-influencer-army.html>
49. Lawson J. Minority TikTok influencers create COVID-19 vaccine awareness in new 'See Friends Again' campaign. February 25, 2021. Accessed August 23, 2021. <https://abcnews.go.com/US/minority-tiktok-influencers-bringing-awareness-covid-19-vaccines/story?id=76108061>
50. Alabama Department of Public Health. Vaccinate Alabama TikTok Contest. Updated July 16, 2021. Accessed August 12, 2021. <https://www.alabamapublichealth.gov/covid19vaccine/tiktok.html>
51. U.S. Surgeon General. Confronting Health Misinformation: The U.S. Surgeon General's Advisory on Building a Healthy Information Environment. Accessed August 17, 2021. <https://www.hhs.gov/sites/default/files/surgeon-general-misinformation-advisory.pdf>
52. Banach DB, Ornstein K, Factor SH, Soriano TA. Seasonal influenza vaccination among homebound elderly receiving home-based primary care in New York City. *J Community Health*. Feb 2012;37(1):10-4. doi:10.1007/s10900-011-9409-z
53. Moran MB, Chatterjee JS, Frank LB, et al. Individual, Cultural and Structural Predictors of Vaccine Safety Confidence and Influenza Vaccination Among Hispanic Female Subgroups. *J Immigr Minor Health*. Aug 2017;19(4):790-800. doi:10.1007/s10903-016-0428-9
54. Zimet GD, Perkins SM, Winston Y, Kee R. Predictors of first and second dose acceptance of hepatitis B vaccine among STD clinic patients. *Int J STD AIDS*. Apr 2008;19(4):246-50. doi:10.1258/ijsa.2007.007136
55. Holman DM, Benard V, Roland KB, Watson M, Liddon N, Stokley S. Barriers to human papillomavirus vaccination among US adolescents: a systematic review of the literature. *JAMA Pediatr*. Jan 2014;168(1):76-82. doi:10.1001/jamapediatrics.2013.2752
56. Frank RG, Dach L, Lurie N. It Was The Government That Produced COVID-19 Vaccine Success. May 14, 2021, Accessed May 14, 2021, <https://www.healthaffairs.org/doi/10.1377/hblog20210512.191448/full/>

57. Keith K. New Guidance On COVID-19 Testing And Vaccines. 2021. <https://www.healthaffairs.org/doi/10.1377/hblog20210303.284998/full/>
58. Hamel L, Lopes L, Sparks G, Stokes M, Brodie M. *KFF COVID-19 Vaccine Monitor: April 2021*. May 6, 2021. Accessed August 18, 2021. <https://www.kff.org/coronavirus-covid-19/poll-finding/kff-covid-19-vaccine-monitor-april-2021/>
59. Sullivan J. States Can Reduce Barriers to COVID-19 Vaccines and Treatment, Especially for Immigrants. April 15, 2021, Accessed April 15, 2021, <https://www.cbpp.org/blog/states-can-reduce-barriers-to-covid-19-vaccines-and-treatment-especially-for-immigrants>
60. Wisconsin Department of Health Services. COVID-19: Find a Vaccine Appointment. Accessed August 18, 2021. <https://www.dhs.wisconsin.gov/covid-19/vaccine-get.htm>
61. CVS pharmacy. Schedule a COVID-19 vaccine. Accessed August 18, 2021. <https://www.cvs.com/immunizations/covid-19-vaccine>
62. The White House. Fact Sheet: President Biden to Announce Additional Efforts to Get America Vaccinated, Including Free Rides to Vaccination Sites from Lyft and Uber, Vaccination Clinics at Community Colleges, and Additional Resources for States' Community Outreach Efforts. Updated May 11, 2021. Accessed August 24, 2021. <https://www.whitehouse.gov/briefing-room/statements-releases/2021/05/11/fact-sheet-president-biden-to-announce-additional-efforts-to-get-america-vaccinated-including-free-rides-to-vaccination-sites-from-lyft-and-uber-vaccination-clinics-at-community-colleges-and-addit/>
63. Wooten J, Benedyk K, Patel M, DeFranco M, Pettigrew E, Grover J. EMS Incorporation in Mass-Vaccination: A Feasibility Study. *Am J Emerg Med*. Feb 26 2021;doi:10.1016/j.ajem.2021.02.047
64. Rural Health Information Hub. Rural COVID-19 Innovations: COVID-19 Vaccination. Updated June 30, 2021. Accessed August 17, 2021. <https://www.ruralhealthinfo.org/topics/covid-19/innovations/vaccination>
65. Missouri Dept. of Health and Senior Services. Missouri partnerships ensure access to COVID-19 vaccines for homebound residents. May 25, 2021, 2021. Accessed August 12, 2021. <https://health.mo.gov/news/newsitem/uuid/4a9b7595-cfdf-4220-b5b1-33f68a2f5a20>
66. Blake B. State program opening up COVID-19 vaccines to homebound Hoosiers. WRTV Indianapolis. Updated February 25, 2021. Accessed August 12, 2021. <https://www.wrtv.com/news/coronavirus/state-program-opening-up-covid-19-vaccines-to-homebound-hoosiers>
67. American Hospital Association. Torrance Memorial and Local Fire Department Ensure Homebound Residents Get Vaccinated. Accessed August 12, 2021, 2021. <https://www.aha.org/vaccine-stories/torrance-memorial-local-fire-department-help-homebound-residents-get-vaccinated>
68. Centers for Medicare and Medicaid Services. Biden Administration Continues Efforts to Increase Vaccinations By Bolstering Payments for At-Home COVID-19 Vaccinations for Medicare Beneficiaries. Updated June 9, 2021. Accessed August 24, 2021. <https://www.cms.gov/newsroom/press-releases/biden-administration-continues-efforts-increase-vaccinations-bolstering-payments-home-covid-19>
69. Masatani M. USC's Street Medicine team delivers COVID-19 vaccines to homeless clients. Updated April 21, 2021. Accessed August 12, 2021. <https://news.usc.edu/185020/covid-vaccines-homeless-clients-usc-street-medicine-team/>

70. Neighborhood Health. *How Music City Achieved a COVID-19 Vaccination Milestone Among Persons Experiencing Homelessness*. Accessed August 12, 2021. <https://www.neighborhoodhealthtn.org/wp-content/uploads/2021/06/Celebrating-a-COVID-19-Vaccination-Milestone-June-2021.pdf>
71. Kim N, Mountain TP. Role of non-traditional locations for seasonal flu vaccination: Empirical evidence and evaluation. *Vaccine*. May 19 2017;35(22):2943-2948. doi:10.1016/j.vaccine.2017.04.023
72. Stinchfield PK. Practice-proven interventions to increase vaccination rates and broaden the immunization season. *Am J Med*. Jul 2008;121(7 Suppl 2):S11-21. doi:10.1016/j.amjmed.2008.05.003
73. Castillo-Neyra R, Bhattacharya B, Saxena A, et al. Optimizing the location of vaccination sites to stop a zoonotic epidemic. *Quantitative Biology*. May 25, 2021
74. Maurer J, Harris KM, Uscher-Pines L. Can routine offering of influenza vaccination in office-based settings reduce racial and ethnic disparities in adult influenza vaccination? *J Gen Intern Med*. Dec 2014;29(12):1624-30. doi:10.1007/s11606-014-2965-z
75. Coady MH, Galea S, Blaney S, Ompad DC, Sisco S, Vlahov D. Project VIVA: a multilevel community-based intervention to increase influenza vaccination rates among hard-to-reach populations in New York City. *Am J Public Health*. Jul 2008;98(7):1314-21. doi:10.2105/ajph.2007.119586
76. Bartsch SM, Taitel MS, DePasse JV, et al. Epidemiologic and economic impact of pharmacies as vaccination locations during an influenza epidemic. *Vaccine*. Nov 12 2018;36(46):7054-7063. doi:10.1016/j.vaccine.2018.09.040
77. Galston WA. COVID-19 vaccinations: Why are some states and localities so much more successful? August 12, 2021. Accessed August 12, 2021. <https://www.brookings.edu/blog/fixgov/2021/01/25/covid-19-vaccinations-why-are-some-states-and-localities-so-much-more-successful/>
78. Marion County Health Department. Mobile vaccination clinic reaches rural areas. Center for Infectious Disease Research and Policy. Accessed August 12, 2021. <https://www.cidrap.umn.edu/practice/mobile-vaccination-clinic-reaches-rural-areas>
79. Hollis J. Mason's mobile vaccination clinics help get COVID-19 shots to those most in need. Accessed August 12, 2021. <https://www2.gmu.edu/news/2021-05/masons-mobile-vaccination-clinics-help-get-covid-19-shots-those-most-need>
80. Igenzoza O, Chiapa-Scifres A. Serving Children in Need: Results from the UNTHSC Pediatric Mobile Clinic. *UNTHSC Scholar*. 2016;
81. Murthy BP, Sterrett N, Weller D, et al. Disparities in COVID-19 Vaccination Coverage Between Urban and Rural Counties - United States, December 14, 2020-April 10, 2021. *MMWR Morb Mortal Wkly Rep*. May 21 2021;70(20):759-764. doi:10.15585/mmwr.mm7020e3
82. *Bowie, Waldorf Vaccine Sites to Offer No-Appointment, Drive-Thru COVID Shots*. Barnes S. April 27, 2021. Accessed August 12, 2021. <https://www.nbcwashington.com/news/coronavirus/bowie-waldorf-vaccine-sites-to-offer-no-appointment-drive-thru-covid-shots/2653347/>
83. Resnick-Ault D, Wendel SK, Skaggs MD, White S, Zane RD. Drive-Through Efficiency: How to Prepare for and Execute a MassVaccination Event. August 12, 2021. Accessed August 12, 2021. <https://catalyst.nejm.org/doi/pdf/10.1056/CAT.21.0058>
84. Connecticut Business & Industry Association. DPH Hosts Free Workplace COVID-19 Vaccination Clinics. Updated June 2, 2021. Accessed August 20, 2021. <https://www.cbia.com/news/hr-safety/dph-hosts-free-workplace-covid-19-vaccination-clinics/>

85. Snowbeck C, Carlson J. Minnesota deploys modified buses for mobile vaccination clinics. *StarTribune*. April 20, 2021. <https://www.startribune.com/minnesota-deploys-modified-buses-for-mobile-vaccination-clinics/600048104/>
86. Zumbach L. There may finally be enough COVID-19 vaccine for employers to offer shots at work. These companies are making plans. *Chicago Tribune*. April 23, 2021. Accessed August 20, 2021. <https://www.chicagotribune.com/business/ct-biz-company-covid-19-vaccination-clinics-20210423-angbenlcc5cprotar2urddkady-story.html>
87. Centers for Disease Control and Prevention. COVID-19 Vaccination Program Operational Guidance. Updated August 10, 2021. Accessed August 25, 2021. <https://www.cdc.gov/vaccines/covid-19/covid19-vaccination-guidance.html>
88. Centers for Disease Control and Prevention. COVID-19 Vaccination Program Jurisdiction Operations Interim Operational Guidance. October 29, 2020
89. Centers for Disease Control and Prevention. Understanding the Pharmacy Partnership for Long-Term Care Program. Updated August 11, 2021. Accessed August 24, 2021. <https://www.cdc.gov/vaccines/covid-19/long-term-care/pharmacy-partnerships.html>
90. Centers for Disease Control and Prevention. Understanding the Federal Retail Pharmacy Program for COVID-19 Vaccination. Updated August 11, 2021. Accessed August 24, 2021. <https://www.cdc.gov/vaccines/covid-19/retail-pharmacy-program/index.html>
91. Health Resources and Services Administration. Health Center Program: Impact and Growth. Updated August 2021. Accessed August 17, 2021. <https://bphc.hrsa.gov/about/healthcenterprogram/index.html>
92. Centers for Disease Control and Prevention. CDC COVID-19 Vaccination Program Provider Requirements and Support. Updated April 30, 2021. Accessed August 25, 2021. <https://www.cdc.gov/vaccines/covid-19/vaccination-provider-support.html>
93. Rust G, Melbourne M, Truman BI, Daniels E, Fry-Johnson Y, Curtin T. Role of the primary care safety net in pandemic influenza. *Am J Public Health*. Oct 2009;99 Suppl 2(Suppl 2):S316-23. doi:10.2105/ajph.2009.161125
94. The White House. Fact Sheet: Biden Administration Announces Historic \$10 Billion Investment to Expand Access to COVID-19 Vaccines and Build Vaccine Confidence in Hardest-Hit and Highest-Risk Communities. March 25, 2021, 2021. Accessed August 12, 2021. <https://www.whitehouse.gov/briefing-room/statements-releases/2021/03/25/fact-sheet-biden-administration-announces-historic-10-billion-investment-to-expand-access-to-covid-19-vaccines-and-build-vaccine-confidence-in-hardest-hit-and-highest-risk-communities/>
95. HHS Press Office. Resources to Support COVID-19 Response of Health Centers in Disproportionately Affected Communities Across the Country. April 29, 2021, Accessed August 17, 2021.
96. HHS Press Office. Biden-Harris Administration Provides Nearly \$144 Million in American Rescue Plan Funds to Support COVID-19 Response Efforts in Underserved Communities. July 15, 2021, 2021. Accessed August 17, 2021. <https://www.hhs.gov/about/news/2021/07/15/biden-harris-administration-provides-nearly-144-million-american-rescue-plan-funds-support-covid-19-response-efforts-underserved-communities.html>
97. Health Resources and Services Administration. *Health Center COVID-19 Survey: National Summary Report*. Health Resources and Services Administration. July 30, 2021. Accessed August 12, 2021. <https://bphc.hrsa.gov/emergency-response/coronavirus-health-center-data>

98. Kim SJ, Watson K, Khare N, Shastri S, Da Goia Pinto CL, Nazir NT. Addressing Racial/Ethnic Equity in Access to COVID-19 Testing Through Drive-Thru And Walk-In Testing Sites in Chicago. *Med Res Arch*. May 2021;9(5)doi:10.18103/mra.v9i5.2430
99. Health Resources and Services Administration. Health Center COVID-19 Vaccinations Among Racial and Ethnic Minority Patients. data.gov2021.
100. HHS Press Office. Biden-Harris Administration Provides \$100 Million to Rural Health Clinics for COVID-19 Vaccine Outreach in Their Communities to Increase Vaccinations. July 22, 2021
101. Rural Health Clinic COVID-19 Vaccine Distribution (RHCVD) Program. Updated May 2021. Accessed August 24, 2021. <https://www.hrsa.gov/coronavirus/rural-health-clinics/distribution>
102. HHS Press Office. HHS Awards \$125 Million in Workforce Grants for Community-Based Efforts to Bolster COVID-19 Vaccinations in Underserved Communities. June 14, 2021
103. HHS Press Office. Biden-Harris Administration Provides \$121 Million in American Rescue Plan Funds to Support Local Community-Based Efforts to Increase COVID-19 Vaccinations in Underserved Communities. July 27, 2021
104. Indian Health Service. IHS COVID-19 Vaccine Plan. Accessed August 21, 2021. <https://www.ihs.gov/coronavirus/vaccine/>
105. Simmons A, Chappel A, Kolbe AR, Bush L, Sommers BD. *Health Disparities by Race and Ethnicity During the COVID-19 Pandemic: Current Evidence and Policy Approaches*. Issue Brief. May 16, 2021. Accessed August 16, 2021. https://aspe.hhs.gov/sites/default/files/migrated_legacy_files/199516/covid-equity-issue-brief.pdf
106. Kolbe A. *Disparities in COVID-19 Vaccination Rates across Racial and Ethnic Minority Groups in the United States*. U.S. Department of Health and Human Services,. April 2021. Accessed August 20, 2021. https://aspe.hhs.gov/sites/default/files/migrated_legacy_files//200341/vaccination-disparities-brief.pdf
107. Indian Health Service. Coronavirus (COVID-19). Updated August 16, 2021. Accessed August 18, 2021. <https://www.ihs.gov/coronavirus/>
108. Bi-Weekly COVID-19 Update for Indian Country (2021). Accessed August 16, 2021. https://www.ihs.gov/sites/coronavirus/themes/responsive2017/display_objects/documents/Bi-WeeklyCOVID-19UpdateforIndianCountry07092021.pdf
109. Brown A. In Hard-Hit Indian Country, Tribes Rapidly Roll Out Vaccines. August 12, 2021. Accessed August 12, 2021. <https://www.pewtrusts.org/en/research-and-analysis/blogs/stateline/2021/02/09/in-hard-hit-indian-country-tribes-rapidly-roll-out-vaccines>
110. Manatt. *Medicaid and CHIP Coverage of COVID-19 Vaccine and Treatment: A Roadmap for State Action During and After the Public Health Emergency*. May 2021. Accessed August 12, 2021. https://www.shvs.org/wp-content/uploads/2021/05/SHVS_Covid-Vaccine-Treatment-Toolkit_Rev-05.12.21.pdf
111. Hinton E, Stolyar L, Rudowitz R. *A Look at How Medicaid Agencies Are Assisting with the COVID-19 Vaccine Roll-Out*. March 12, 2021. Accessed August 12, 2021. <https://www.kff.org/coronavirus-covid-19/issue-brief/a-look-at-how-medicaid-agencies-are-assisting-with-the-covid-19-vaccine-roll-out/>
112. American Public Health Association. Community Health Workers. <https://www.apha.org/apha-communities/member-sections/community-health-workers>. Accessed August 20, 2021. <https://www.apha.org/apha-communities/member-sections/community-health-workers>

113. Centers for Medicare and Medicaid Services. Connecting Kids to Coverage National Campaign. Accessed August 24, 2021. <https://www.insurekidsnow.gov/campaign-information/index.html>
114. Coverage and Reimbursement of COVID-19 Vaccines, Vaccine Administration, and CostSharing under Medicaid, the Children’s Health Insurance Program, and Basic Health Program (2021). Accessed August 12, 2021. <https://www.medicaid.gov/state-resource-center/downloads/covid-19-vaccine-toolkit.pdf>
115. Medicare and Medicaid Programs; COVID-19 Vaccine Requirements for Long-Term Care (LTC) Facilities and Intermediate Care Facilities for Individuals With Intellectual Disabilities (ICFs-IID) Residents, Clients, and Staff (Federal Register) (2021). Accessed August 12, 2021. <https://www.federalregister.gov/documents/2021/05/13/2021-10122/medicare-and-medicaid-programs-covid-19-vaccine-requirements-for-long-term-care-ltc-facilities-and>
116. Centers for Medicare and Medicaid Services. CMS Expanding Efforts to Grow COVID-19 Vaccine Confidence and Uptake Amongst Nation’s Most Vulnerable. Press release. May 11, 2021, 2021. Accessed August 12, 2021. <https://www.cms.gov/newsroom/press-releases/cms-expanding-efforts-grow-covid-19-vaccine-confidence-and-uptake-amongst-nations-most-vulnerable>
117. Centers for Medicare and Medicaid Services. Coronavirus (COVID-19) Partner Resources: Long Term Care Community Champions Video. Updated August 23, 2021. Accessed August 24, 2021. <https://www.cms.gov/outreach-education/partner-resources/coronavirus-covid-19-partner-resources>
118. National Institutes of Health. Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV). Accessed August 12, 2021. <https://www.nih.gov/research-training/medical-research-initiatives/activ>
119. National Institutes of Health. Rapid Acceleration of Diagnostics (RADX). Accessed August 16, 2021. <https://www.nih.gov/research-training/medical-research-initiatives/radx>
120. National Institute of Allergy and Infectious Diseases. COVID-19 Prevention Network (CoVPN). Accessed August 16, 2021. <https://www.coronaviruspreventionnetwork.org/about-covpn/>
121. National Institutes of Health. CEAL at a Glance. Accessed August 25, 2021. <https://covid19community.nih.gov/about>
122. National Institute of Health. *Partnering with Communities to Address COVID-19: The NIH Community Engagement Alliance (CEAL) Against COVID-19 Disparities*. Accessed August 12, 2021. https://covid19community.nih.gov/sites/default/files/About_CEAL_Fact_Sheet_English.pdf
123. HHS Press Office. HHS Announces Partnership with Morehouse School of Medicine to Fight COVID-19 in Racial and Ethnic Minority and Vulnerable Communities. Updated June 23, 2020. Accessed August 25, 2021. <https://www.minorityhealth.hhs.gov/omh/Content.aspx?ID=17500&lvl=2&lvid=8>
124. HHS Press Office. HHS Announces Awardees of \$250 Million to Fight COVID-19 and Improve Health Literacy Among Racial and Ethnic Minority and Vulnerable Communities. Updated June 28, 2021. Accessed August 25, 2021. <https://www.minorityhealth.hhs.gov/omh/content.aspx?ID=22542>
125. National Governors Association. State Strategies For Engaging And Leveraging Primary Care Providers As COVID-19 Vaccinators. Accessed August 12, 2021. <https://www.nga.org/center/publications/state-strategies-for-engaging-and-leveraging-primary-care-providers-as-covid-19-vaccinators/>
126. Ndugga N, Artiga S, Pham O. *How are States Addressing Racial Equity in COVID-19 Vaccine Efforts?* <https://www.kff.org/racial-equity-and-health-policy/issue-brief/how-are-states-addressing-racial-equity-in-covid-19-vaccine-efforts/>

127. Maine Center for Disease Control and Prevention. Coronavirus Disease 2019 (COVID-19) - Updates and Information. Maine.gov. Accessed August 17, 2021. <https://www.maine.gov/dhhs/mecdc/public-health-systems/rhpc/rural-health.shtml>
128. State of Maine Department of Health and Human Services. *State of Maine: 2019 Maine Shared Community Health*. Needs Assessment Report. Accessed August 16, 2021. <https://www.maine.gov/dhhs/mecdc/phdata/MaineCHNA/documents/2019-State-Report.pdf>
129. Mills DA, J. B. Lessons Learned From Maine's Nation-Leading Vaccination Efforts. August 12, 2021. Accessed August 12, 2021. <https://www.healthaffairs.org/doi/10.1377/hblog20210722.638604/full/>
130. New Jersey Department of Health. *NJ COVID-19 Vaccination Plan At-A-Glance*. November 2, 2020. Accessed August 17, 2021. https://www.nj.gov/health/cd/documents/topics/NCOV/Vax_Plan_English.pdf
131. Stainton LH. NJ Targeting Medicaid Members in Vaccine Push. NJ Spotlight News. Updated May 5, 2021. Accessed August 12, 2021. <https://www.njspotlight.com/2021/05/nj-covid-19-vaccine-medicaid-outreach-campaign-50-million/>
132. NJ COVID-19 Information Hub. COVID Community Corps. Official Site of the State of New Jersey. Accessed 2021, August 12. <https://covid19.nj.gov/pages/communitycorps>
133. Centers for Disease Control and Prevention. Southern New Jersey Equitable Approach to Overcoming the Pandemic. Accessed August 17, 2021. <https://www.cdc.gov/vaccines/covid-19/health-departments/features/south-nj.html>
134. Minnesota Department of Health. 2017 Minnesota Statewide Health Assessment. 2017;
135. Minnesota Department of Health. COVID-19 Vaccine Phases and Planning. Updated March 10, 2021. Accessed August 23, 2021, <https://www.health.state.mn.us/diseases/coronavirus/vaccine/plan.html>
136. Minnesota Department of Health. Vaccine Connector. Accessed August 23, 2021. <https://mn.gov/covid19/vaccine/connector/>
137. Office of Governor Tim Walz. State Kicks Off 'Vax to School' Student Vaccination Campaign. Accessed August 23, 2021. <https://mn.gov/governor/news/?id=1055-492102>
138. Minnesota Department of Health. Host a Community COVID-19 Vaccination Event. Accessed August 23, 2021. <https://www.health.state.mn.us/diseases/coronavirus/vaccine/hostevent.html>
139. Minnesota Department of Health. State Fair Vaccine. Accessed August 23, 2021. <https://mn.gov/covid19/vaccine/find-vaccine/statefairvaccine/index.jsp>
140. Minnesota Department of Health. Be a Vaccine Advocate: COVID-19 Vaccine Toolkit for Individuals and Organizations. Accessed August 23, 2021. <https://www.health.state.mn.us/diseases/coronavirus/vaccine/communitytk.html>
141. Minnesota Department of Health. COVID-19 Community Mobile Vaccination Bus Project. Accessed August 23, 2021. <https://www.health.state.mn.us/diseases/coronavirus/vaccine/bus.html>
142. Onile-Ere B. Minnesota places of worship will play an important role in vaccination of at-risk populations. Accessed August 23, 2021. <https://www.fox9.com/news/places-of-worship-will-play-an-important-role-in-vaccine-rollout-for-minnesota>
143. Thiede D. 'Shots at the Shop' aims to boost COVID vaccinations as cases spike. Accessed August 23, 2021. <https://www.kare11.com/article/news/health/coronavirus/shots-at-the-shop-boost-covid-vaccinations-cases-spike/89-67a89035-3bdc-4018-8599-2c657d8873c0>

144. Wong CA, Dowler S, Moore AF, et al. COVID-19 Vaccine Administration, by Race and Ethnicity - North Carolina, December 14, 2020-April 6, 2021. *MMWR Morb Mortal Wkly Rep.* Jul 16 2021;70(28):991-996. doi:10.15585/mmwr.mm7028a2
145. North Carolina Department of Health and Human Services. *North Carolina's COVID-19 Vaccine Roadmap*. Accessed August 12, 2021. <https://covid19.ncdhhs.gov/media/2285/open>
146. Stein J, Fasold M, Daguerre KJ, et al. Use of an Analytics and Electronic Health Record-Based Approach for Targeted COVID-19 Vaccine Outreach to Marginalized Populations. *JAMA Oncol.* Aug 19 2021;doi:10.1001/jamaoncol.2021.3833
147. Centers for Disease Control and Prevention. COVID-19 Vaccine Community Toolkit. Updated July 1, 2021. Accessed August 12, 2021. <https://www.cdc.gov/coronavirus/2019-ncov/vaccines/toolkits/community-organization.html>
148. Centers for Disease Control and Prevention. Guidance for Vaccinating Older Adults and People with Disabilities: Ensuring Equitable COVID-19 Vaccine Access. Updated May 14, 2021. Accessed August 17, 2021. <https://www.cdc.gov/vaccines/covid-19/clinical-considerations/older-adults-and-disability/access.html>
149. Strategies for Helping Older Adults and People with Disabilities Access COVID-19 Vaccines (2021). Accessed August 17, 2021. https://acl.gov/sites/default/files/2021-04/ACLStrategiesVaccineAccess_Final.pdf
150. Food and Drug Administration. Multilingual COVID-19 Resources. Accessed August 25, 2021. <https://www.fda.gov/emergency-preparedness-and-response/coronavirus-disease-2019-covid-19/multilingual-covid-19-resources>
151. Health Resources and Services Administration. Coronavirus (COVID-19) Resources for Community-Based Workforce Outreach Awardees. Updated August 2021. Accessed August 17, 2021. <https://www.hrsa.gov/coronavirus/community-based-workforce-resources>
152. National Institutes of Health. Resources to Share. Accessed August 25, 2021. <https://covid19community.nih.gov/communication-resources>
153. National Institutes of Health. Addressing COVID-19 Misinformation: A Tip Sheet for Health Professionals Working with Community Members. Accessed August 17, 2021. https://covid19community.nih.gov/sites/default/files/Adapting_Fact-Based_Information_to_the_Needs_of_Communities_English.pdf
154. Chou WYS, Burgdorf CE, Gaysynsky A, Hunter CM. *COVID-19 Vaccination Communication: Applying Behavioral and Social Science to Address Vaccine Hesitancy and Foster Vaccine Confidence*. Accessed August 18, 2021. https://obssr.od.nih.gov/sites/obssr/files/inline-files/OBSSR_VaccineWhitePaper_FINAL_508.pdf
155. American Psychological Association. *Building Vaccine Confidence Through Community Engagement*. Accessed August 17, 2021. <https://www.apa.org/topics/covid-19/equity-resources/building-vaccine-confidence.pdf>
156. National Academies of Sciences. *Strategies for Building Confidence in the COVID-19 Vaccines*. February 2021. Accessed August 17, 2021. <https://www.nap.edu/catalog/26068/strategies-for-building-confidence-in-the-covid-19-vaccines>
157. National Safety Council. Vaccines: Employer Guidance. Accessed August 17, 2021. <https://www.nsc.org/workplace/safety-topics/vaccines/employer-guidance>
158. National Rural Health Association. COVID-19 Vaccine Resources. Accessed August 25, 2021. <https://www.ruralhealthweb.org/programs/covid-19-pandemic/covid-19-vaccine-resources>

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