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COVID-19 vaccines meet 100 million uncertain Americans

More than 100 million Americans are uncertain about vaccination. Public- and private-sector leaders can take action to support adoption, including incremental investment in the range of $10 billion.

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The rapid progression of COVID-19-vaccine candidates over the past several months has been a historic scientific accomplishment. With the vaccine developed by the BioNTech and Pfizer partnership receiving an Emergency Use Authorization in the United States, and the Moderna vaccine nearing the same milestone as of December 18, 2020, we must turn our attention to the next challenge ahead of us: supporting Americans in vaccine adoption. The difference between about 100 million Americans (those who say they are interested) and about 200 million (including those currently uncertain) getting vaccinated could mean saving many thousands of lives and generating hundreds of billions of dollars of incremental GDP to restore livelihoods in the United States (see sidebar "Insights on COVID-19 vaccination in the United States").

There are at least five challenges to at-scale COVID-19 vaccine adoption: historical analogues consistently demonstrate the challenges of public-health-initiative adoption in the United States; about 50 to 70 percent of Americans, including those in at-risk segments, convey uncertainty toward COVID-19 vaccination; the drivers of vaccine uncertainty are complex; many of the most credible influencers, physicians, and nurses are uncertain; and mis- and disinformation exists and could increase. These five challenges confront the United States at present. However, there is potential that uncertainty will subside as vaccine adoption progresses with prioritized populations in the coming months. We won't know for some time, and by the time that we do, it might be too late to act.

Successful analogues suggest that achieving large-scale vaccine adoption will require creating much stronger conviction among patients and influencers, providing high levels of convenience, and ensuring that vaccination is truly costless or better for consumers.

Delivering conviction, convenience, and costlessness will require four major shifts in the actions of stakeholders across sectors:

— public and private sectors coming together to launch an unprecedented campaign to support vaccine adoption at scale

— government action to develop and innovate the infrastructure further to support vaccine adoption

— healthcare providers and payers with vaccination at the top of their agendas

— employer mobilization and action to support employees to get vaccinated

Such collective action will require investment in the range of an incremental $10 billion. The incremental economic benefits of widespread COVID-19-vaccine adoption, however, would be orders of magnitude higher, and the value in lives saved and negative long-term health effects avoided would be immeasurable.

Insights on COVID-19 vaccination in the United States

The analysis and perspectives in the article are most relevant to the extent that policy makers and other healthcare leaders in the United States conclude that the benefits of large-scale COVID-19 vaccination outweigh the risks. The evidence base on COVID-19 vaccines is still developing, and there are many unknowns on the vaccine candidates' long-term safety and effectiveness—more so than any other vaccine used at scale in the United States. We understand that current assessments of the vaccines by leading scientific experts at the US Food and Drug Administration, National Institutes of Health, and CDC, among others, have carefully considered the risks and benefits of vaccination with the best available information and will continue to closely review the emerging evidence over the coming months and years. Furthermore, we recognize vaccination is a personal choice—balancing personal healthcare choices with public health benefits. In that context, the perspectives in the article focus on how to ensure that the conditions to support adoption (assuming that the vaccines continue to be deemed safe and effective) are in place and that consumers are fully equipped to make decisions about and access vaccination if they want it.

Very-high rates of vaccine adoption would be epidemiologically and economically beneficial

In our article "When will the COVID-19 pandemic end?," we explore two time frames to end the pandemic: first, an epidemiological end point, in which herd immunity is reached and public-health-emergency interventions deployed in 2020 are no longer needed; and second, and likely an earlier end point, a transition to normalcy, when almost all aspects of social and economic life can resume by vaccination of the highest-risk populations, improved testing and therapeutics, and strengthening of public-health responses which, combined, can significantly reduce mortality.

While the level of vaccine adoption required to return to normalcy is unknown, the benefits of driving toward full herd immunity are clearer. Full herd immunity would reduce COVID-19-related morbidity, mortality, and associated treatment costs, release pressure from states to continue related safeguarding, and enable stronger economic growth.

If we take a 70 percent adoption rate among Americans 12 and older as the level needed to reach immunity, it implies that 195 million of 280 million eligible Americans would get vaccinated (see sidebar "Vaccine and immunity assumptions and scenarios").

Vaccine and immunity assumptions and scenarios

Our analysis suggests that achieving full herd immunity to COVID-19 may require a significant majority of the adult population to be vaccinated, even after considering the proportion with some level of immunity from natural infection. Depending on the lower end of the age range for vaccination (for example, 12 or 18 years old) and the scenarios for vaccine effectiveness in reducing transmission (for example, 95 percent versus 75 percent), achieving herd immunity will require the immunization of between 56 and 93 percent of the eligible population.

In a scenario in which only adults aged 18 and older receive a COVID-19 vaccine (consistent with the initial trial readouts) and the vaccines all have efficacy of 95 percent (as seen in the trials of the vaccines developed by Moderna and the team of BioNTech and Pfizer), then 61 to 81 percent of adults would need to be vaccinated to reach herd immunity.

In a scenario in which the vaccines are safe and effective for those aged 12 and older (consistent with Pfizer–BioNTech's and Moderna's current trials underway), then vaccination of 56 to 73 percent of that population would be sufficient to reach herd immunity.

However, there is still significant uncertainty around efficacy levels. The COVID-19 vaccine developed by the team of AstraZeneca and the University of Oxford, for example, showed only 62 percent efficacy with a full-dose regimen. The pivotal trials of the Moderna and Pfizer–BioNTech vaccines measure transmission reduction in symptomatic disease, which is not the same as reducing transmission—the result needed to reach herd immunity.

In a scenario in which vaccines are, on average, only 75 percent effective in reducing transmission, and only those aged 12 and older are vaccinated, then achieving herd immunity would require vaccinating 70 to 93 percent of that population.

Such scenarios are consistent with statements made by Moncef Slaoui, the leader of Operation Warp Speed, that approximately 70 percent of the population will need to be immunized to return to normal. In order to reach an adoption rate of 70 percent, approximately 195 million of the approximately 278 million residents in the United States aged 12 and older would need to be vaccinated.

We include all Americans aged 12 and older, even if they have tested positive for COVID-19 or have had positive serology tests, for three reasons. First, we don't yet know how long natural immunity lasts or how natural-immunity duration might vary based on the severity of clinical disease (asymptomatic versus mild versus severe). Second, diagnostic and serology tests have variable performance and may have rendered false-positive results for some people. Finally, it may be logistically challenging and costly to determine millions of individuals' serological-marker status reliably.

Higher vaccine adoption would likely enable stronger economic growth by increasing confidence in the safety of economic and social activities. To the extent that COVID-19 exists beyond the point at which we "return to normalcy," it could prevent large portions of the population from feeling safe enough to eat out, attend events, send their children to in-person school, or show up to work in person. Herd immunity could also increase business confidence against the risk of COVID-19 resurgence and inspire greater investment and hiring.

According to analysis by McKinsey in partnership with Oxford Economics, the difference between a partially effective or regionalized response to COVID-19 versus a highly effective control could bring forward the return of GDP to where we were at the end of 2019 by three to six months. This could amount to about $800 billion to $1.1 trillion in additional GDP by the end of 2022. Achieving herd immunity would likely contribute, if not be the definitive contributing factor, to achieving the more favorable outcomes.

The challenge: Five potential challenges to at-scale vaccine adoption

An optimist might note that hundreds of millions of Americans now wear masks, the flu vaccination rate in 2020 approached a record-high 50 percent, and a recent Gallup Poll found that 58 percent of Americans would be willing to receive a coronavirus vaccine.

Digging deeper presents a much murkier reality, with at least five potential challenges to at-scale vaccine adoption. These five challenges confront the United States at present. However, there is potential that uncertainty will subside as vaccine adoption progresses with prioritized populations in the coming months. We won't know for some time, and by the time that we do, it might be too late to act.

1. Historical analogues consistently demonstrate the challenges of public-health-initiative adoption in the United States

Low adoption of public health measures is the norm, not the exception, in the United States. Among many examples, only about half of American adults get the flu vaccine despite decades of safety and efficacy evidence and widespread availability; rates of other adult vaccinations in populations under 65 are even lower. It took 33 years from 1983 to 2016 for seat belt use to increase from 14 percent to 90 percent. It has taken 38 years from 1980 to 2018 for the percentage of Americans receiving fluoridated water to increase from 50 percent to 63 percent. One of the most successful public health interventions, to reduce smoking, has taken 20 years to reduce the adult-smoking rate alone by nine percentage points, from 23 percent to 14 percent.

2. Approximately 50 to 70 percent of people, including those in at-risk segments, convey uncertainty toward COVID-19 vaccination

According to our most recent US-consumer research, 63 percent of respondents are cautious about or unlikely to adopt COVID-19 vaccination. The "cautious," who comprise 45 percent of respondents (the largest segment), are those who will wait and see how a vaccine performs in the "real world" before deciding if they will get vaccinated. Another 18 percent say they are unlikely to vaccinate. The relative proportion of consumers in the "interested," "cautious," and "unlikely" segments has remained largely consistent in the past five months, with some slight positive shifts in subsegments of the cautious, even following positive readouts from the clinical trials of the Moderna and Pfizer–BioNTech vaccines.

At-risk Americans are also uncertain. Despite the well-documented risks that elderly people face when contracting COVID-19, only 65 percent of respondents older than 65 years reported that they are interested in getting vaccinated. Only 31 percent of black respondents and 36 percent of Hispanic respondents said that they are interested. Other recent surveys show similar results. While 60 percent of those earning more than $100,000 per year report that they are interested in getting vaccinated, only 31 percent of those who earn less than $25,000 report the same. These findings are consistent with observed, historical behavior among higher-risk segments with respect to other vaccines.

Consumer sentiment does not always predict actual behaviors, of course. First, sentiment can and does evolve. Second, there has always been a gap between what people say they will do about public health and what they actually do. That said, the research suggests that about 30 to 50 percent of people are interested in getting vaccinated against COVID-19, and the other 50 to 70 percent are uncertain or unlikely. That means that among the 195 million Americans who would likely need to be vaccinated to reach herd immunity in the population, about 100 million to 150 million would need to be engaged further to decide and take action to get vaccinated.

3. The drivers of vaccine uncertainty are complex

The most commonly cited reasons Americans give for not being vaccinated, including with respect to flu shots, are concerns with vaccination side effects. This has been true for decades. Today, many Americans are concerned about the safety and side effects of a COVID-19 vaccine, especially given the unprecedented speed at which the vaccines were developed and the limited time in which we have monitored the safety. Indeed, in our research, 40 percent of consumers stated that the most important factor in their decision to vaccinate against COVID-19 was the side effects. Such fears could well be amplified as new information emerges, including the recent announcement that as many as 15 percent of those receiving a COVID-19 vaccine could suffer side effects that "can last up to a day and a half" including "fever, chills, muscle aches, and headaches."

Other well-documented reasons for low vaccine adoption include "free rider" challenges and inertia.[1] Most people understand that if enough other people get vaccinated, they themselves will have less benefit from the vaccine. This phenomenon could be exacerbated during the initial launch of the vaccine, when the media will likely focus on the substantial number of people taking the vaccine and the (hopefully) reductions in mortality. For many Americans, a vaccine is simply not a priority. Even if they aren't worried about the safety, they aren't sufficiently convicted to take the time to be vaccinated.

4. Many of the most credible influencers, physicians, and nurses are uncertain

The entities most active in developing COVID-19 vaccines to date have been the federal government and the pharmaceutical industry. When consumers are asked, however, about who they trust most, it is other stakeholders that are highest on the list—most notably their physicians and nurses. It will be critical that these other influencers complement and reinforce the messages shared by the government and pharmaceutical companies. The challenge is that many physicians and nurses, the most critical authority figures for many people, are also uncertain. We surveyed more than 300 physicians in late September, and 29 percent were either uncertain or unlikely to recommend vaccination to their patients. An even larger proportion, 36 percent, were uncertain or unlikely to get COVID-19 vaccination themselves. In contrast, 90 to 95 percent of physicians typically say they recommend flu shots to their patients. An October 2020 survey of 12,939 nurses by the American Nurses Association and American Nurses Foundation showed that only 15 percent were "very confident that a COVID-19 vaccine will be safe and effective" and only 34 percent said they would voluntarily be vaccinated. Eighty-four percent believe that vaccine development is occurring too quickly. Although we anticipate that the recent trial results could shift some of these perspectives more favorably, we expect that uncertainty will remain, as it has with consumers. Without these critical influencers on board, it will be difficult to educate and engage wary consumers.

5. Mis- and disinformation exist and could increase

Americans have a relatively low understanding of disease and vaccines, in general. Indeed, many respondents to our last consumer survey were unable to name the leading COVID-19-vaccine

[1] For a summary of the history of free-rider challenges across different vaccines, see Tammy Leonard, et al., "Do traditional economic theories of free riding behavior explain spatial clustering of HPV vaccine uptake?" *SSM: Population Health*, August 2019, ncbi.nlm.nih.gov.

manufacturers and had limited knowledge of the vaccine candidates' key attributes. There are multiple reasons for this reality including the emergence of social media as a major source of information and the well-documented growth of the "antivaccination" movement. A recent in-depth analysis of online narratives about vaccines on social media by the organization First Draft found that the majority of social media discussions about COVID-19 focus on "political and economic motives" of actors and institutions involved in vaccine development and the "safety, efficacy, and necessity" concerns around vaccines.

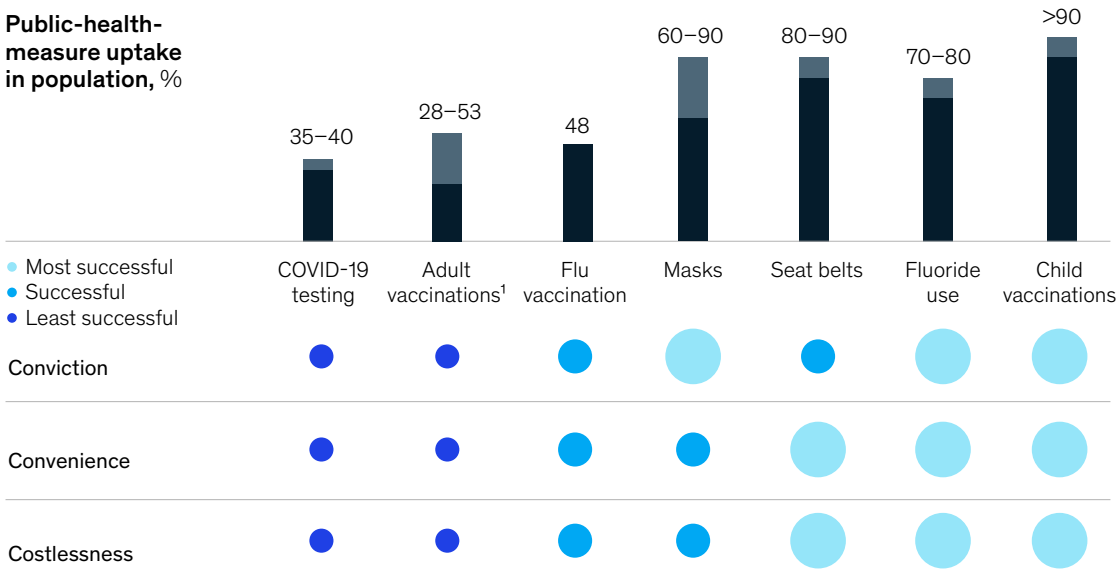
Regardless of which vaccines emerge, it is reasonable to assume that significant amounts of incorrect or misleading information will be spread. This is especially problematic given that, based on our most recent survey, more consumers source their COVID-19-vaccination information from social media (27 percent) than from physicians (16 percent) and from state-, local-, and federal-government officials (22 to 24 percent).

The antidote: Conviction, convenience, and costlessness (or better)

What will support adoption among consumers? There are clues from analogues where high portions of the population have adopted a protocol or taken action, including child vaccination, fluoridated water, and mask wearing. As shown in Exhibit 1, we can conclude that some combination of at least three highly interrelated conditions are required for broad adoption: conviction, convenience, and costlessness (or better).

Exhibit 1

Widespread adoption of public-health initiatives correlates with high levels of conviction, convenience, and costlessness.



[1]CDC adult vaccination composite measure for adults aged 18 years and older, excluding flu. Range represents proportion of adults in that age group receiving routinely recommended age-appropriate vaccines based on CDC's 2017 National Health Interview Survey.

1. Conviction

Conviction is more than openness: it is a committed belief, deeply held. As we've described, some 100 million or more Americans are uncertain about receiving a COVID-19 vaccine. We'd expect that high adoption rates would be marked by millions of Americans holding the conviction that getting vaccinated as soon as possible is worth it.

People don't necessarily need to build conviction that a vaccine will be risk-free; no medication is without risk. Rather, people need to believe that the benefits of vaccination are greater than the perceived risks and costs and that the evidence supports this statement. One way to build conviction is to demonstrate that a COVID-19 vaccine could make the recipient safer. Social obligations—do the right thing, protect others, open the economy—can be powerful motivators as well. In our research, respondents who said they were interested in vaccination were evenly split in their rationale between the personal ("I think it will protect me"), at 57 percent, and the communal ("it's the right thing to do"), at 53 percent. Conviction can also emerge from understanding the consequences of not receiving a vaccine.

Conviction can be created or deepened with three complementary approaches: education, influence, and peer-based normalization.

Education

People who are uncertain need facts, evidence, and transparency to help inform decision making. We queried respondents as to how important seven different types of information would be to their deciding whether or not to be vaccinated against COVID-19, with data points that addressed clinical information, side effects, setting, experience, and financial considerations. Respondents indicated that all seven types of information were highly relevant. Effective education will require dynamic information sharing, including responding to new evidence and anecdote to include efficacy and side effects.

Influence

American's views are highly affected by people and institutions perceived to be credible. Prominent influential voices include social, entertainment, and faith leaders, but vary significantly by segment of the population. Our research suggests that consumers across all segments most trust physicians' advice on COVID-19 vaccination. Nurses and pharmacists will also play an important influencing role. However, the relative power of influencers varies across segments. For example, respondents aged 65 and older in our survey said that they relied less on their physicians for COVID-19-vaccination advice relative to respondents from other age groups; 18-to-24-year-olds were more than 170 percent more likely to rely on family members for COVID-19-vaccination advice. Effectively engaging the uncertain requires mobilizing not just physicians but a broader set of influencers relevant to different consumer segments.

Peer-based normalization

Our peers may be the most potent influencers of all, and peer encouragement will be vital if COVID-19 vaccines are to become the norm. Normalization can occur based on social-media posts, sharing with friends, and even wearing "I was vaccinated" stickers. The reciprocal approach—the social stigma of going against the group—is also powerful, sometimes even more so. If the consequences of harming other people by not being vaccinated can be demonstrated, a stigma could attach to those who eschew the vaccine and are perceived as harming others.

2. Convenience
Decades of experience, including during the pandemic, teach us that even minor inconveniences significantly reduce adoption of public health measures, including vaccinations. This may be especially relevant for uncertain people "looking for an excuse" to not be vaccinated.

Consumers are heterogenous and place different emphasis on different aspects of convenience. To one person, convenience is being able to schedule an appointment via text and be vaccinated via drive through or at home. To another it's the ability to walk in at midnight without a wait since they work second shift. To another it's the ability to be vaccinated during their check-in with the orthopedist.

That said, all else equal, the more sites, the more embedded access is, the greater the physical proximity of sites, the more diversity in settings, the lower wait times are and the easier it is to identify and navigate, the more likely it is that more people will be vaccinated.

In Exhibit 2, we identify several key aspects of convenience and a set of measures that state and local governments could use to inform the degree of convenience they are achieving.

Exhibit 2

There are multiple opportunities to make vaccinations more convenient.

Specific actions to increase vaccination convenience

Frictionless	❑ Vaccinations embedded into life activities (eg, school, work)
Many high-proximity sites	❑ High number of administration sites per capita ❑ Short walking distance, particularly for urban residents or employees ❑ Short driving distance or short distance from public transportation ❑ Sites in more distributed rural communities
Diverse settings	❑ Physician offices offering vaccine (including specialists) ❑ Pharmacies ❑ Alternative sites (eg, in-home, drive-throughs, community centers, places of worship)
Broad availability	❑ Vaccine sites with extended hours (eg, before and after work) ❑ Vaccine sites with weekend hours
Predictable, low wait times	❑ Number of available appointments ❑ Lower median wait times across sites ❑ Sites with vaccination on demand
Ease of identification and navigation	❑ Transparent, reliable information—including wait times—for all vaccine sites ❑ Omnichannel communication (eg, via phone, internet, app) ❑ Rapid scheduling (eg, web-based app) ❑ Push reminders for second dose appointment

3. Costless (or better)
For consumers who have decided that they would like to be vaccinated, the cost of the vaccine (real or perceived) can serve as a barrier to adoption. Cost barriers can include direct costs of paying for the vaccination and associated visit (including being billed for it later) and indirect costs of vaccination such as the cost of transportation, time off of work, missing work in case of side effects, and securing child care. Furthermore, consumers want to be confident that they will not bear personal costs (such as lower government benefits and deportation) from getting vaccinated. Addressing these cost barriers proactively could be especially critical to supporting the low-income segment of the population to access COVID-19 vaccination if they want it.

In addition to addressing the costs of vaccine access, one could also raise the question of whether incentives should be considered. This is a complex question, and we should note that any benefits (or penalties) associated with vaccination need to be considered with a deep concern for equity and avoidance of unfavorable, unintended consequences. Options to be considered include financial incentives, nonfinancial benefits, and social recognition (for example, social-media badges).

Delivering the antidote: Four shifts for an unprecedented campaign across the public and private sectors

Supporting COVID-19-vaccine adoption among the 100 million or more currently uncertain Americans will require four major shifts across stakeholders:

1. *Public and private sectors coming together to launch an unprecedented campaign to support vaccine adoption at scale.* While significant cross-sector collaboration has occurred across the overall response to the COVID-19 pandemic and on the supply side of vaccines (such as R&D and the supply chain), the same has not yet occurred on supporting adoption. Public- and private-sector leaders need to come together on an integrated vision and agenda to support vaccine adoption at scale. This will require collaboration and orchestration across government, payers, providers, employers, manufacturers, community organizations, and influencers to remove barriers to adoption comprehensively, rapidly, and effectively. It will require innovation and new ways of doing things.

2. *Government action to develop and innovate further the infrastructure to support vaccine adoption.* The current approach and infrastructure to enable adult vaccine immunization is underdeveloped and is unlikely to adequately support the adoption levels needed in the time frame aspired. Investments in new approaches (for example, at-home immunization, solving the economics for providers) that will be critical to addressing the challenges associated with the COVID-19 pandemic can also create lasting impact for the system in the long term.

3. *Healthcare providers and payers with vaccination at the top of their agendas.* The healthcare system sees COVID-19 vaccination as a civic duty, an act of responsibility—among the system's many other responsibilities in delivering diagnosis and treatment of COVID-19—to bring this pandemic to an end. Providers and payers have one of the most important roles to play in supporting vaccination, but realizing the full impact of this role will require them to prioritize vaccination, invest in it, and partner with governments and employers to make a step change in how to approach adult vaccination.

4. *Employer mobilization and action to support employees to get vaccinated.* Employers today express uncertainty about their roles in vaccination and are grappling with difficult questions about how to enable vaccination among their workforces. Many are searching for counsel on what to do. There is an opportunity for employers to act now to engage employees—such as by addressing logistical and financial barriers to vaccination (for example, offering paid time off, reimbursing employees for costs incurred), sharing relevant information with employees to help them make informed vaccination decisions, and making vaccination as convenient as possible (for example, by offering on-site vaccination).

Within the context of these shifts, there are critical roles for each stakeholder group—and unique actions to take (Exhibit 3).

More than $10 billion additional investments to support vaccine adoption

To date, the federal government alone has spent more than $10 billion to address the supply-side challenges associated with a COVID-19 vaccine, including product development, manufacturing scale-up, and product acquisition.[2] The US Department of Health and Human Services (HHS) has also partnered with retail pharmacies to scale availability of COVID-19 vaccines to 60 percent of the pharmacies in the country, and to additionally deliver COVID-19 vaccination to long-term-care facilities.

Current investments in vaccine adoption are insufficient to support it at scale

The planned investment to support COVID-19-vaccine adoption is more modest. For administration, Medicare plans to reimburse providers $28.39 to administer single-dose vaccines and, if two doses are needed, $16.64 for the first dose and $28.39 for the second.[3] Medicaid typically reimburses at or

Exhibit 3

Key stakeholders can support vaccine adoption in different ways.

Potential actions for consideration

Government

- ❑ Define an adoption strategy, establish dedicated leadership, and allocate sufficient resources
- ❑ Prepare to measure adoption in all forms
- ❑ Engage and enlist a broad set of influencers
- ❑ Support the private sector to support adoption
- ❑ Amplify Medicaid's role in reaching at-risk populations
- ❑ Consider actions only government can perform (eg, accreditation, public events, policies)

Providers

- ❑ Make vaccination a business priority
- ❑ Set aspiration of high vaccination rates among current patients
- ❑ Prepare to deliver high levels of convenience
- ❑ Engage employed and affiliated clinical communities and strengthen their conviction
- ❑ Develop plan to proactively engage and educate existing patients
- ❑ Consider industry collaboration with benefit to society

Payers

- ❑ Make vaccination a business priority
- ❑ Adapt Medicare Advantage and Medicaid to engage members, consider in-home vaccination, address social barriers, and adapt provider incentives
- ❑ Support employers with messaging tool kits, enable or provide on-site vaccination, and leverage care-management infrastructure to engage employees and their families
- ❑ Consider industry-wide collaboration with benefit to society (eg, accreditation, public events, policies)

Employers/community

- ❑ Develop detailed plan to support vaccinations
- ❑ Amplify education and key messages in partnership with government and health-system actors
- ❑ Secure on-site vaccination or sponsor employees to take time off during the workday to be vaccinated (with pay)
- ❑ Address financial and logistical costs to vaccination (eg, transportation cost)
- ❑ Clarify what, if any, support from the government would help

[2] Investments to date include approximately $10 billion for R&D and manufacture for several COVID-19-vaccine candidates, some $10 billion more for the vaccine product (booked through prepurchase deals), and about $500 million for vaccine supply chain through the Biomedical Advanced Research and Development Authority.

[3] Payers plan to reimburse providers for the administration costs associated with COVID-19-vaccine delivery in line with historical precedent and those associated with other vaccines. The Centers for Medicare & Medicaid Services (CMS) states that "these rates recognize the costs involved in administering the vaccine, including the additional resources involved with required public health reporting, conducting important outreach and patient education, and spending additional time with patients answering any questions they may have about the vaccine." Commercial payers and those involved in Medicaid typically follow Medicare policy and will likely offer similar administration fees. "Medicare COVID-19 vaccine shot payment," CMS, December 3, 2020, cms.gov.

slightly below Medicare rates, while private payers typically pay above Medicare rates. For education, HHS is leading two broad vaccine-education campaigns, including a $250 million COVID-19-communications campaign called the "Building Vaccine Confidence" campaign (which is now ramping up), and the Centers for Disease Control and Prevention (CDC) "Vaccinate with Confidence" campaign. States have asked for $500 million in federal funding to do COVID-19-vaccine outreach, but much of that money has not yet been allocated.

Our analysis suggests that this level of planned investment is unlikely to be sufficient. We looked to analogues to assess the level of investments that might be needed (Exhibit 4).

Administrative costs

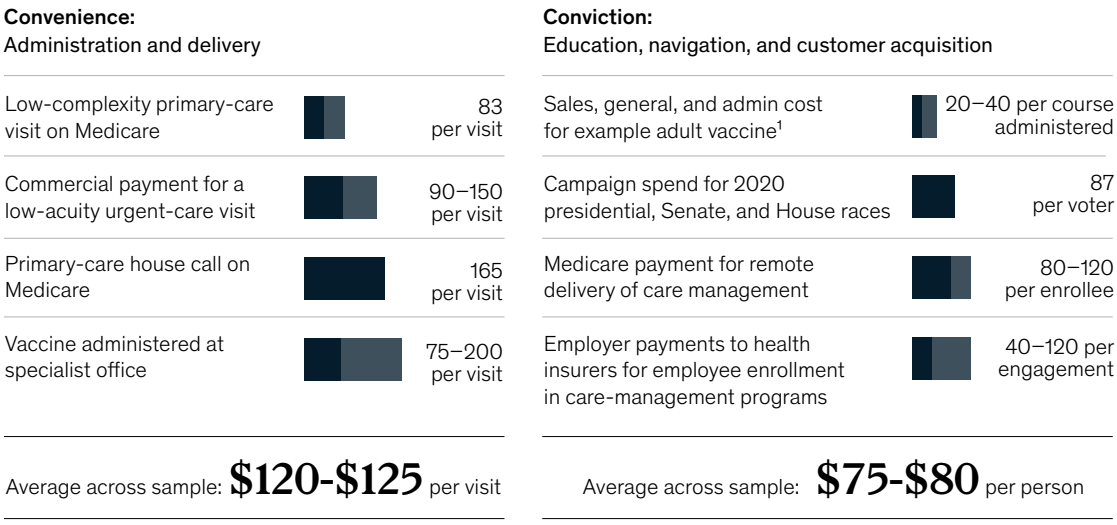
Based on our analysis, the planned administrative fee level may be adequate to cover the cost associated with vaccine administration in existing settings with reasonably high volumes; however, it may not cover costs associated with more diverse clinical settings that would drive convenience for patients, nor does the administration fee fully compensate providers for conducting outreach to patients. For example, the commercial payments or reimbursement for more convenient forms of care, such as in-home care or urgent-care centers, can range from $80 to $165 per visit. Providers are also likely to consider the opportunity cost of vaccination (for example, the time to vaccinate that could have been used for other services), which we estimate at $75 to $200 per visit.

The recent experience with COVID-19-testing collection provides a case in point. Reimbursement for COVID-19-testing collection is approximately $25 per test, a level that is broadly in the range of Medicare's reimbursement levels for COVID-19 vaccination. That approach has not led to high conviction, convenience, or costlessness. In fact, there is significant anecdotal evidence that many consumers have faced an insufficient number of collection sites, ambiguity around out-of-pocket costs, long wait times, and inconsistent education. These challenges are likely part of the reason why, according to our research, only 36 percent of people with symptoms of COVID-19 even attempt to get tested.

Exhibit 4

Analogues of investments to support convenience and cost for other health services suggest a range of $80-120 per person.

Example spend to drive convenience and conviction in other healthcare services in the US, $



[1]Based on estimate of selling, general, and administrative spend of 10–20% of average price of flu, pneumococcal pneumonia, and zoster vaccines.

Education and outreach

Several analogues suggest how expensive it is to motivate action among consumers. For example, vaccine manufacturers commonly spend between 10 and 20 percent of their revenues on selling, general, and administrative costs to market and sell their vaccines. For a $200 vaccine (such as pneumococcal conjugate vaccines, some of the most widely used vaccines among adults aged 65 and older), this would amount to $20 to $40 per person vaccinated to educate them and their physicians. When payers or providers are paid directly to educate patients or achieve a specific outcome, payment is typically in the range of $50 to $150 per person per outcome. Although these levels of per-person investment may be practically too high if we extrapolated them to 100 million people, they highlight that the current spending on education and adoption, which, by our count, is in the range of about $5 per uncertain American, is far short of what might be needed to engage and educate consumers fully.

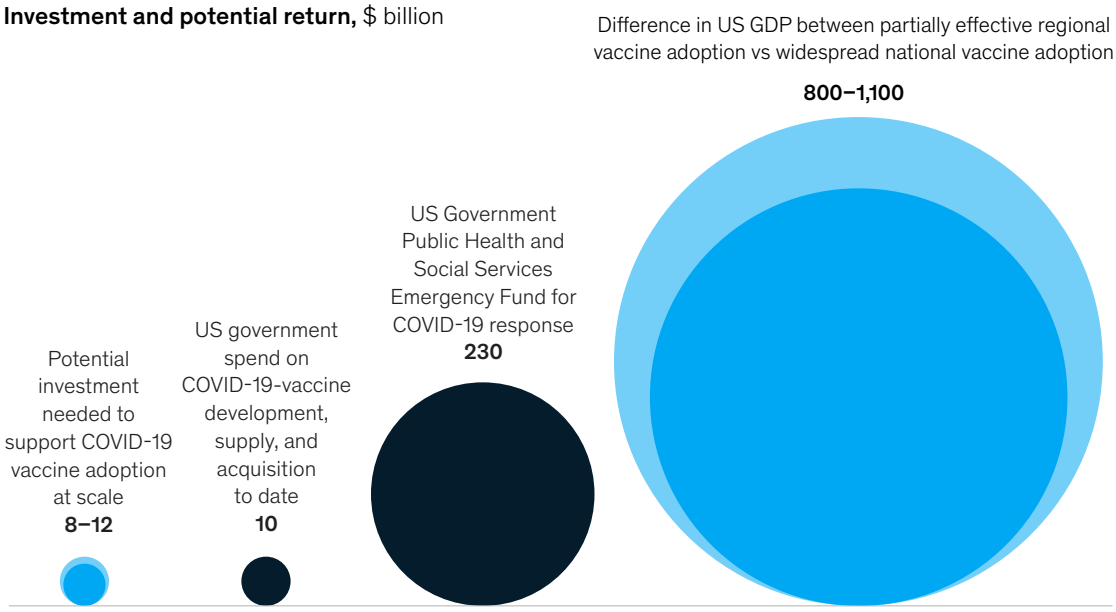
Investing for maximum effect

Although no analogue is perfect, and it is difficult to predict exactly how much investment could be needed to build conviction, offer convenience, and achieve costlessness for 100 uncertain Americans, the analogues in Exhibit 4 do offer reference points. If we make the assumption that each uncertain person will require some support (be it on conviction, convenience, or cost), and we take the lower end of the analogues, we estimate the lower end of the investment range to be $80 per person. Given the scale of the COVID-19 vaccination context, we took a conservative estimate of the upper end of the investment of $120 per person, as there are likely to be scale efficiencies relative to the analogues. This upper end, which is equivalent to the $120 per visit cost of the convenience analogues, assumes that some but not all people would benefit from investments in convenience, (eg, 50 percent of people prefer to receive their two vaccine doses at alternative sites of care). These assumptions lead us to a top-down estimate of an incremental investment of $80 to $120 (and possibly more) per uncertain person, or about $8 billion to $12 billion to support adoption among 100 million uncertain Americans (Exhibit 5).

Exhibit 5

Investing to support COVID-19-vaccine adoption could have outsize economic impact.

Investment and potential return, $ billion



Source: Oxford University; US Department of Health and Human Services; US Government Accountability Office; McKinsey

This approximately $10 billion-plus amount in potential societal investment could be deployed to encourage favorable private-sector behaviors and to fund government-led actions. Some examples include the following:

— Increase and possibly make variable the administration fee to providers to improve patient convenience (such as more staff to reduce wait times, more flexible hours, and at-home offerings) and to encourage them to educate and engage their patients proactively. The government or health insurers could create performance bonuses based on operational metrics (for example, wait times) and patient-vaccination rates.

— Offer payers support to educate and engage members and support employers in patient engagement. Payers have the most scaled at-home capability to drive convenience for those who prefer to be vaccinated at home. Possible performance incentives could be, for example, in the form of higher Star Ratings to Medicare Advantage plans with higher vaccine-adoption rates.

— Support pharmacies to scale convenient COVID-19-vaccine services to the remaining 40 percent of operators, likely more independent pharmacies. This could be pursued through upfront funding to increase pharmacist capacity but also supplemented with performance-based funding for pharmacies that have relatively higher vaccination rates. A logical focus would be pharmacies that serve traditionally underserved populations.

— Fund private community-based organizations to do outreach and education at a local level. Such outreach could be especially effective in engaging underserved communities that may have less exposure to broad public-health campaigns.

— Additional investment could also be used to underwrite the creation of the actions and interventions that governments are exclusively able to perform described in the previous section (such as state-specific registries, "vaccine accreditation," and high-volume sites).

This incremental investment must be considered in the context of the impact on lives and livelihoods. As we noted earlier, achieving herd immunity through vaccine adoption at scale could mean the difference between a partially effective or regionalized response to the COVID-19 pandemic and a highly effective control. The latter economic scenario would bring forward the return of GDP to where we were at the end of 2019 by three to six months, amounting to approximately $800 billion to $1.1 trillion in additional GDP by the end of 2022. It is worthwhile to invest now to increase the probability of a confident and rapid economic recovery and to simultaneously build the infrastructure to support broader adult vaccination.

It's easy to contend that, with the recent clinical-trial results, Americans will adopt COVID-19 vaccines at scale. However, many facts suggest otherwise. Now is the moment of truth for leaders across public and private sectors to work together—and invest—to support vaccine adoption at a scale that puts the United States quickly and firmly on the path to societal and economic recovery.

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