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Beyond Politics — Promoting Covid-19 Vaccination in the United States

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The United States has invested more than $10 billion in Operation Warp Speed to fast-track SARS-CoV-2 vaccines from conception to market in 1 year. The result is 11 candidates reaching the final stage of Food and Drug Administration testing — a phenomenal improvement over past development timelines. Indeed, two SARS-CoV-2 vaccines are already available to Americans.

Given this level of investment, skill, and good fortune in developing a vaccine, it will be tragic if we fail to curtail the virus because Americans refuse to be vaccinated. Despite widespread suffering from Covid-19, credible surveys indicate that the proportion of the U.S. population willing to be vaccinated has fluctuated from 72% in May to 51% in September and 60% in November; of the 39% of respondents who indicated that they probably or definitely would *not* get the vaccine, only 46% said they might be open to vaccination once others start getting it and more information becomes available.[1]

These findings underscore the tremendous undertaking facing vaccine communication teams, who must persuade many of these people to be vaccinated if we're to achieve the vaccination rate — as high as 80%[2] — needed to return to normalcy. Even then, 100% of people who said they would "definitely or probably" get vaccinated must follow through, and 100% of people who said they didn't plan to but could change their mind must be persuaded and motivated to act. Vaccine promoters will have to be creative in marshaling their resources and broad-minded in considering tools for addressing this enormous challenge.[3]

The slow adoption of even the most beneficial new product is unsurprising to researchers who study the diffusion of innovation.[4,5] From electrifying homes to developing personal computers, history has shown that "if you build it, they will come" makes a terrible marketing plan.

As with many disruptive trends and the innovations they spawn, Americans' attitudes toward Covid-19 and related health behaviors have been shaped by a complex combination of information, relative benefits, and social identity.[6,7] Consider that although the use of face masks was promoted on the basis of strong relative benefits (high efficacy of slowing viral spread and low cost), what predominated in many peoples' decisions about masking was its symbolic relationship to political identity.[8]

So how should we promote vaccination? The data surrounding vaccination are still evolving, and different vaccines may come to market. The likely mixed messages about these products' safety and efficacy (even if they reflect small relative differences arising from clinical trial design) may exacerbate the challenge of vaccine adoption. Add to this the interaction of attitudes toward the virus and vaccines, and it's clear that we will need myriad communication strategies to ensure widespread vaccine uptake.

Any successful marketing strategy will be multifaceted.[9,10] Consumer research and behavioral economics suggest 12 key strategies for an effective vaccine-promotion effort (Table 1). Not all strategies are equally actionable for all health agents, who range from leaders of federal agencies to leaders of local clinics; different actions are best suited for different players (Table 2). But by combining relevant strategies for various persuasive tasks, we can develop a comprehensive plan, incorporating multiple actions and tactics to promote vaccine adoption. The tactics used can be prioritized according to each population's degree of vaccine hesitancy (Fig. 1). We believe that

Table 1. Strategies for Promoting Covid-19 Vaccination.*

Strategy	Needed Action	Sample Tactics
Segment public according to identity barriers	Qualitative research or text mining of social media to determine why patients feel vaccination runs counter to their identity.	Create targeted messaging based on relevant barriers, such as a "Go out with a bang, but don't die *this* death" campaign for groups with a Covid-defiant identity.
Find a common enemy	Message testing to determine what common enemies resonate across two polarized groups. Look for an enemy that prompts more animosity than the opposite group does.	If a common enemy is poverty or recession: "This economy needs a shot in the arm. We can do that." If a common enemy is those who don't believe in America: "Think we can't vaccinate 300 million people in 3 months? Watch us."
Use analogy	Develop a list of appropriate analogies for critical facts, processes, or statistics and share them through health care channels. Encourage trusted medical providers to prepare their own analogies for common vaccine questions. Use analogies to augment more complicated discussions of fact.	Use process analogies (e.g., if asked how the vaccine works, say "mRNA is like a teacher that shows the body how to make the antibodies that fight off Covid.") Use statistical analogies (e.g., "You'd be more likely to get hit by lightning than to die from Covid after getting vaccinated.")
Increase observability	Make it easy to see, in person or online, who has been vaccinated.	Offer a wearable token — a bracelet, sticker, or pin — that can be observed by others. Offer social media frames and banners (e.g., "I'm a First Responder and I'm Vaccinated"). Partner with celebrities, respected local leaders, and members of all parties to show them, on old and new media, being vaccinated.
Leverage natural scarcity	Use a national or state referendum to decide who gains access to the vaccine first, or request community input through surveys.	Frame the chosen "first receivers" — whether the elderly, first responders, teachers, or essential workers — as nationally valued and honored.
Predict and address negative attributions	Monitor media to quickly identify negative attributions. For segment-specific attributions, partner with community leaders or influencers to identify and counter negative attributions.	If delays in vaccine accessibility are being attributed to government incompetence, use daily briefings to show a complicated "air traffic control map" tracking freezer trucks. If prioritized deployment of vaccines in historically disadvantaged neighborhoods is being attributed to a belief that these populations are expendable "lab rats," include these communities' trusted local leaders in prioritization discussions.
Prompt anticipated regret	Develop and use communications to remind people of a low-probability but high-stakes outcomes and the resulting strong emotions.	Train family practice staff to use questions and statements such as: "What would change in your family if you became a Covid long-hauler and had permanent lung or heart damage?" "I've seen the crushing guilt of families that lose someone to Covid after not being quite careful enough — don't do that to yourself."
Avoid conveying piecemeal risk information	Coordinate press releases with stakeholders to avoid letting bad news trickle out and making it seem worse than it is.	If a delay seems likely, wait until you have a clear sense of the new situation and present any bad news up front and, ideally, just once.
Promote compromise options	Find ways to promote a sense of control by offering multiple vaccination choices; introduce other actions to frame vaccination as a middle or normal choice.	Train cold-call promoters or survey takers to ask people if they will get the vaccine later, get it now, or get it now and sign up to donate plasma.
Create FOMO motivations	Frame vaccination as a desirable opportunity not to be missed. Find and provide rewards for vaccine completion.	Partner with employers to give employees a day off to be vaccinated. Create a campaign to promote the idea that families should stagger vaccinations so that each "hero" gets a day in bed with snacks and binge-watching movies. Use monetary incentives (tax deductions or insurance refunds). Encourage celebrities to hold future free events for vaccinated fans.
Combat uniqueness neglect	Work with health care providers to identify patient groups that might feel they have special conditions unlike "ordinary" people.	Train medical personal to identify uniqueness neglect (e.g., patients might say, "The vaccine is fine, but it won't work for *me*.") Offer safe (even if largely unnecessary) modifications to standard vaccine delivery (e.g., topical analgesics before injection; getting the shot late in the day).
Neutralize the case versus base-rate heuristic	Communicate with clinicians and other front-line health personnel about the base-rate fallacy. Build and use collection of positive anecdotes.	Encourage clinicians to counter patients' anecdotal "bad reaction" stories with "good reaction" stories rather than statistics. Ensure that DHHS briefings and websites include a continuous collection of real people's stories about good vaccination experiences.

* DHHS denotes Department of Health and Human Services, and FOMO fear of missing out.

Table 2. Key Actions for Players in Various Health Care Roles.*

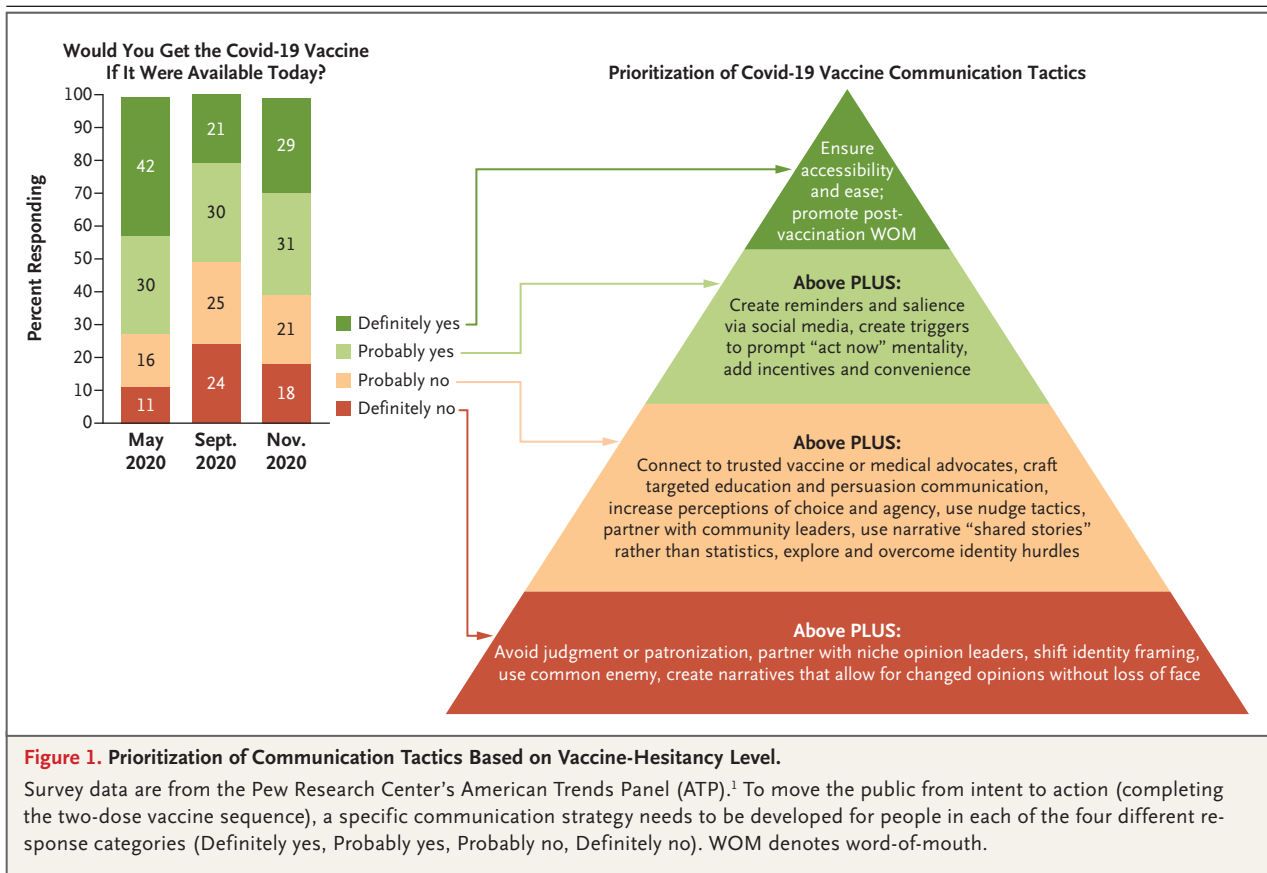| Health Care Player	Key Actions
Local clinicians and practices; care facilities (e.g., nursing homes)	1. Prepare list of common vaccine questions. 2. Investigate specific concerns of your various segments of patients. 3. Develop list of effective responses. 4. Practice and train staff for responses. 5. Add incentives (free sports exams, prizes). 6. Develop prompts to persuade vaccine-hesitant patients and offer compromises. 7. Make vaccination status observable in your community.
Hospital management	1. Determine campaign themes and messaging for local community. 2. Train medical personnel on responses to common questions and concerns. 3. Select statistical analogies for use by staff. 4. Add incentives for employees (even if vaccination is mandated). 5. Train PR office personnel for coordinated responses to new events. 6. Develop special vaccine protocols for unique cases.
Insurance and benefits management	1. Determine campaign themes and messaging for client base. 2. Select analogies for use in messaging. 3. Add incentives for clients. 4. Train PR office personnel for coordinated responses to new events. 5. Develop mailing for client segments.
State and county health agencies	1. Prepare list of common vaccine questions. 2. Investigate specific concerns from different segments of patients locally. 3. Develop list of effective responses. 4. Determine campaign themes and messaging for regional or local community. 5. Create materials for medical personnel for responding to common questions and concerns. 6. Find local analogies for use in public announcements and messaging. 7. Create a multifaceted social media network strategy. 8. Partner with companies and organizations to create incentives. 9. Train PR office personnel for coordinated responses to new events. 10. Determine and coordinate order of vaccine access and communicate rationales. 11. Partner with local celebrities and trusted community leaders to promote vaccination.
Federal agencies (e.g., DHHS, CDC)	1. Investigate specific concerns from nationally critical segments (e.g., health care workers). 2. Develop list of effective responses. 3. Determine campaign themes and messaging for national and targeted segments. 4. Create materials for large organizations, logistics, and health care systems. 5. Select analogies for use in public announcements and messaging. 6. Create a multifaceted social media network strategy. 7. Partner with companies and organizations to create vaccine incentives. 8. Explore federal incentives (tax). 9. Train PR office personnel on coordinated responses to new events. 10. Offer advice on order of vaccine access and communicate rationales. 11. Partner with national celebrities and trusted leaders to promote vaccination.
Advocacy groups (e.g., AARP, NAACP)	1. Determine campaign themes and messaging for client base. 2. Select analogies for use in messaging. 3. Train PR office personnel for coordinated responses to new events. 4. Develop mailing for client segments.

* AARP was formerly the American Association of Retired Persons. CDC denotes Centers for Disease Control and Prevention, DHHS Department of Health and Human Services, NAACP National Association for the Advancement of Colored People, and PR public relations.

the following elements should be considered in a national strategy and reinforced by local public health officials and individual clinicians.

SEGMENT PUBLIC ACCORDING TO IDENTITY BARRIERS

Medicine frequently segments patients by demographic or socioeconomic traits, but a striking aspect of the public response to the pandemic has been the association of anti-Covid efforts with personal identity, especially political identity.[11] Some groups have incorporated masks into their self-image as a symbol of community responsibility and respect, while others see wearing masks as a sign of weakness or cowardice. Some mask-protest leaders represent masks as an attack on freedom and thus democracy. Yet we must be

Figure 1. Prioritization of Communication Tactics Based on Vaccine-Hesitancy Level.

Survey data are from the Pew Research Center's American Trends Panel (ATP).[1] To move the public from intent to action (completing the two-dose vaccine sequence), a specific communication strategy needs to be developed for people in each of the four different response categories (Definitely yes, Probably yes, Probably no, Definitely no). WOM denotes word-of-mouth.

careful not to inadvertently reinforce the identity drivers behind mask wearing; for example, labeling vaccine-hesitant people as "conservative" or "Covid-hoaxers" tells political conservatives that vaccines are a liberal concept and open to skepticism. And it tells people who are vaccine-hesitant for other identity-related reasons (e.g., distrust of medical research by some people of color) that their concerns are not being heard or respected by the medical community.

This is not a simple case of red-state/blue-state duality. Some elderly Republicans, for example, are quietly worried by their party's failure to take the pandemic seriously, but are afraid to rock the boat; other elderly Republicans are defiant in their assertion of fearlessness. No common persuasive message will work for both groups: highlighting the virus's danger would scare the former group but might reinforce the latter's defiance. Such segmentation suggests that we need different messages targeted not according to such demographic characteristics as age, but according to barriers created by self-identity, in-groups,

or social beliefs.[12] In this case, campaigns could address the first group's fear of social censure and promote the idea that the best good works are done quietly, known only to oneself, while assuring the second group that their legacy of rebellion should include dying on some fearless adventure, not alone, locked in tubes, wheezing through a plastic straw.

FIND A COMMON ENEMY

Uniting two polarized groups often depends on finding a third, more hated common enemy that can be used to build community across differences.[13] The obvious common enemy here is the virus, but demonizing it will work only if both groups see it as real and dangerous. Currently, some groups view the virus threat as inflated or a hoax,[12] though uncontrolled spread across communities may make it harder to dismiss as the winter progresses. For now, appropriate common enemies may be downstream effects: we can focus on "battling" poverty by getting people back

to work or on "racing" other countries to return to normal.

USE ANALOGY

Analogies used in communication harness understanding of some familiar concept to elucidate a complex new concept.[14] Many attitudes toward the pandemic are responses to complex medical information being communicated at a troubled time. Analogies can communicate rich information in a single image or phrase. For example, "the war against Covid" may connote coming together, making sacrifices, doing tough things, and emerging on the other side with new improvements and inventions in hand.

Or consider the difficulty of conveying statistical information. According to the National Center for Educational Statistics, more than half of Americans score 2 or lower on the 5-point numeracy scale developed by the Program for the International Assessment of Adult Competencies, and even highly educated people can make errors in understanding risk. People may ask whether the vaccine "guarantees" that they won't get Covid-19, and of course it can't, but an analogy to some extremely rare event may help: we can say, "The likelihood is about the same as being killed in a car crash," rather than simply "no."

INCREASE OBSERVABILITY

The introduction of the Apple iPod was one of the most successful product launches ever. Although there were other MP3 players, the iPod dominated the market and the mental schemas of consumers. One reason was its white earphones: even if the device itself was hidden in a pocket, observers knew that the wearer had an iPod. iPod owners became walking advertisements. An innovation known as Rogers' concept of observability suggests that consumers' ability to observe others' choices can increase an innovation's rate of adoption.[15]

Imagine how vaccination status could be made observable. Perhaps wearable tokens, such as Livestrong-style bracelets or stickers or pins similar to those given to voters, would work for in-person environments. Digital badges (such as frames or banners for one's social media profile photo) are easy to create and effective in virtual environments.

LEVERAGE NATURAL SCARCITY

In consumer markets, scarcity often signals exclusivity and prompts greater interest or desirability.[16] Because of a natural attentiveness to negative outcomes, we're attuned to goods that might run out or opportunities we might miss.[17] Although it would be wrong to create an artificial scarcity of vaccines to boost the attractiveness of securing one, we should not ignore natural scarcity's effect on attitudes toward vaccines as they're rolled out. We should frame early access to vaccines as a mark of honor or respect for people we want to protect, whether they're older Americans or people with chronic illnesses, first responders (police, firefighters, and emergency medical technicians), medical staff, schoolteachers, or essential workers. For healthy people who identify as "tough" (such as first responders), we can frame priority access as a sign of respect "awarded" to them. Leveraging scarcity may help counteract guinea pig metaphors and hesitancy to "go first." At the same time, the unexpected initial scarcity and early demand for the vaccine should not provide a false sense of security that we will not need to address resistance as we strive to achieve our population vaccination goals.

PREDICT AND ADDRESS NEGATIVE ATTRIBUTIONS

"Attribution theory," from social psychology, explores how people confronted with something unexpected or troublesome develop explanations for it.[18] For new products, consumers' attributions can help or hurt adoption. For example, if a product launch occurs later than initially announced, people might attribute the delay to a problem with the product (even if the delay was caused by bad weather slowing a shipment). If a product runs out quickly, people might assume it's highly desirable and popular (even if, really, poor supply-chain planning led to a stock-out).

The need for trust and transparency demands that vaccine promoters not fabricate positive attributions. But given attributions' power (and the ability of unconfirmed information to spread on social media), effective promotion will involve predicting negative attributions and combating them directly. For example, policymakers may choose to make vaccines available first in historically disadvantaged neighborhoods, aiming to get protec-

tion early to people who can least afford a setback. But a possible negative attribution is that these people are being treated as "lab rats" to test the vaccine's safety before it's given to wealthier people. Anticipating and combating negative attributions requires listening openly to the vaccine-hesitant, building trust, and addressing false attributions directly and consistently. There is also a clear need to work with social media platforms to limit dissemination of false information.[19]

PROMPT ANTICIPATED REGRET

Research on insurance suggests that many people overinsure themselves for highly unlikely occurrences such as flooding in areas that are not floodplains.[20] One major reason is anticipated regret: emotions, such as regret, are powerful motivators of decisions, and they can motivate us even before they're experienced.[21] Vaccination can prevent a specific anticipated regret: the fear that someone we love will die from the illness. People may be especially persuaded by a fear for their loved ones. We may also be motivated by others' anticipated regret (e.g., "Do it so your mother can stop worrying and get some sleep.")

AVOID CONVEYING PIECEMEAL RISK INFORMATION

One challenge for the pandemic response is the slow release of information about the scientific milestones in vaccine development. Although this information flow is a well-intentioned effort to improve transparency for the scientific community, it could backfire with the public. Again, consider how our evolving knowledge of the benefits of masks has sown confusion when it appears that experts are not clear on the issue.

Current research[22] suggests that piecemeal risk — risk information that trickles out over time — can be especially dangerous for uptake of pharmaceutical innovations. People are more sensitive to the risk of side effects and significantly less likely to try a new drug when risk information is presented piecemeal over time than when a single news source presents a final risk assessment. Though the efficacy and safety of Covid-19 vaccines are highly newsworthy, policymakers should recognize that negative trends that "trickle out" can disproportionately influence the public. Vaccine news cannot be covered up, but it can be presented in total, rather than with incremental updates.

PROMOTE COMPROMISE OPTIONS

Coffee shops' practice of offering three serving sizes builds on consumer research suggesting that people seek easy rules of thumb in making uncertain decisions like how much coffee we need; one robust example is our tendency to look for normal or nonextreme choices and thus choose middle, or compromise, options.[23] At the coffee shop, a tally of drink-size selections would probably follow a bell-shaped distribution, with most customers choosing the middle option.

In medicine, patients are often offered only two choices — to get or not get some recommended treatment. But the compromise effect suggests that we can nudge people to a desired choice and increase their confidence about it by making it the compromise option. To make vaccination decisions a three-option rather than two-option choice, we could allow people to get the shot now, sign up for a later date, or not get it at all. Or all three options could include the vaccine (get the shot now and donate plasma, just get the shot now, or get the shot later). The key is to avoid depicting vaccination as the most extreme action in a range of choices.

CREATE FOMO (FEAR OF MISSING OUT) MOTIVATIONS

People dislike missing out on fun things, but vaccination is not normally a fun experience — we get an injection and may incur unpleasant side effects, and some Covid vaccines require a second shot weeks after the first. Though the public health benefits are clear, there is no immediate individual reward for completing the vaccination sequence — nothing to miss out on. One possibility is to create a desirable reward so people feel an urgency to act lest they miss out on a limited opportunity.[24]

Immediate rewards could be tied to getting vaccinated and even to the potential for greater side effects of the second shot in a two-dose sequence.[19] For example, employers could offer a day off to reward an employee's contribution to a safe workplace. A public messaging campaign could create a narrative about families staggering their vaccinations so one "vaccine hero" at a

time can stay on the sofa and be coddled with snacks and movies. Universities could offer students and staff tickets to future sports or cultural events. Financial incentives such as insurance rebates and tax benefits could also be considered.

COMBAT UNIQUENESS NEGLECT

Uniqueness neglect is a phenomenon recently conceptualized as one reason patients are resistant to having artificial intelligence diagnose or treat them.[25] Some people believe they are unique or different from the average person (e.g., more sensitive, more prone to side effects). They may see vaccines as one-size-fits-all options for the average person — but not for them. Clinics may be wise to develop some variations in vaccine delivery (e.g., topical numbing of the injection site for sensitive patients) that cater to such patients. As more vaccines are approved and specific indications, such as pediatric labeling, are developed, we can address this tendency with more specific matching of patients to characteristics of different vaccines.

NEUTRALIZE THE CASE VERSUS BASE-RATE HEURISTIC

Although medical school emphasizes communication using facts and statistics, people often underweight base-rate statistics and overweight anecdotal cases — stories — in judging probability, a decision heuristic known as the base-rate fallacy or case versus base-rate effect.[26]

The first patient with a rare side effect from a vaccine, anaphylaxis from the Pfizer-BioNTech vaccine,[27] was heavily profiled in the media. Such a story is more emotionally evocative and will go more "viral" than a numerical statistic. Unfortunately, experts will probably respond by citing statistics showing that such cases are rare. But when a vaccine-hesitant patient repeats side-effect stories, clinicians can counter with their own stories, rather than elaborate statistical explanations. Furthermore, vaccine communications teams should proactively spread their own "cases" in addition to statistics. News briefings or websites could include real individual success stories — a Georgia family going out for ice cream after being vaccinated, perhaps, or Indiana retirees joyfully visiting neighbors 10 days after receiving the vaccine. Such stories, however banal, can help counteract the shock value of a few bad-effect stories.

The development of Covid-19 vaccines is an amazing scientific achievement. Adoption of vaccines by the U.S. public will require a similar level of achievement. Vaccine promotion demands a multifaceted behavioral approach if it is to succeed.

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