

AMERICAN PUBLIC HEALTH ASSOCIATION

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COVID-19 CONVERSATIONS

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COVID-19 VACCINES: THE REALITIES OF
THE NEXT STEPS

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WEDNESDAY
DECEMBER 9, 2020

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The COVID-19 Vaccines: the Realities of the Next Steps webinar met via Video Teleconference, at 5:00 p.m. EST, Jewel Mullen, Moderator, presiding.

PRESENT

JEWEL MULLEN, MD, MPH, Associate Dean for Health Equity, University of Texas at Austin Dell Medical School; Moderator

NOAH BREWER, PhD, Professor, Department of Health Behavior, University of North Carolina Gillings School of Global Public Health

KATIE GREEN, Visiting Policy Associate, Duke-Margolis Center for Health Policy

PAUL OFFIT, MD, Director, Vaccine Education Center, Children's Hospital of Philadelphia

JULIE SWANN, PhD, Department Head, Edward P. Fitts Department of Industrial and Systems Engineering, North Carolina State University

ALSO PRESENT

SUSAN POLAN, PhD, Associate Executive Director for Public Affairs and Advocacy, American Public Health Association

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5:00 p.m.

DR. POLAN: Brought to you by APHA and the National Academy of Medicine. Today's webinar is entitled COVID-19 Vaccines: the Realities of the Next Steps.

Today's webinar has been approved for 1.5 continuing education credits for CHES, CME, CNE, and CPH. None of the speakers have been involved in financial relationships to disclose.

Please note that if you want continuing education credit, you should have registered with your first and last name. Everyone who wants credit must have their own registration and watch today's event in its entirety.

All of the participants today will receive an email within a few days from cpd@confex.com with information on claiming credit. Online evaluations must be submitted by January 20, 2021 to receive continuing education credit.

If you have any topics you'd like us to address today or in future webinars, please email us at apha@apha.org. If you experience technical

difficulties during the webinar, please enter it into the Q&A and someone will be in contact with you shortly.

This webinar will be recorded and the recording and transcript will be available on COVID19conversation.org within the next day or two.

More information on this series and recordings of past webinars are also available at that link.

Now I would like to introduce our moderator for today, Dr. Jewel Mullen. Dr. Mullen is an Associate Dean for Health Equity at the University of Texas at Austin Dell Medical School, as well as an Associate Professor in the school's Population Health and Internal Medicine Departments.

Dr. Mullen is an internist, epidemiologist, public health expert, and the former principal assistant secretary for health in the United States Department of Health and Human Services.

While at HHS, she also served as the acting assistant secretary for health and acting director of the National Vaccine Program Office.

Previously, she served as commissioner of the Connecticut Department of Public Health.

Her career has spanned clinical, research, teaching, and administrative roles focused on improving the health of all people, especially those who are underserved.

A former president of the Association of State and Territorial Health Officials, Dr. Mullen is a current part of the Centers for Disease and Prevention's Morbidity --

(Simultaneous speaking.)

DR. POLAN: Please put yourself on mute.

(Simultaneous speaking.)

DR. POLAN: Please put yourself on mute.

Thank you. And she was a member of the study committee on allocation of COVID-19 vaccines at the National Academies of Medicine. Dr. Mullen, I --

(Simultaneous speaking.)

DR. MULLEN: Thank you, Susan. I hope I'm not breaking up, because you were. Welcome, everyone, to the webinar. Today, as we discuss --

(Simultaneous speaking.)

DR. OFFIT: Dr. Lurie, you need to put yourself on mute.

PARTICIPANT: Nicky?

DR. LURIE: Hang on.

DR. MULLEN: Thanks, Susan, and welcome, everyone. Today, as we discuss updated information on COVID-19 vaccine development, distribution, and allocation, I can share that the questions I hear repeatedly are how is this going to happen and how is this going to work?

I don't stress when responding. Instead, I smile, which I often do, and say this is public health. Public health is accustomed to being in the mode of prepare, hurry up, wait, and always prepare as we apply lessons from past experience.

So, I'm privileged to moderate this APHA and National Academy of Medicine conversation today.

We're moving away from theory about vaccine distribution and allocation to actual practice.

Having been a member of the National Academy's study committee that created the framework

for equitable allocation of COVID-19 vaccines, my goal is to bring the imprint of that framework into today's conversation. Equity and ethics can inform every element of vaccine distribution across our communities.

I'd like to now formally introduce today's presenters, Dr. Paul Offit, Katie Greene, Dr. Julie Swann, and Dr. Noel Brewer.

Dr. Offit is the Director of the Vaccine Education Center at the Children's Hospital of Philadelphia, as well as the Maurice R. Hilleman Professor of Vaccinology and a Professor of Pediatrics at the Perelman School of Medicine at the University of Pennsylvania.

Dr. Offit has published more than 160 papers in medical and scientific journals in the areas of rotavirus specific immune responses and vaccine safety.

The recipient of many awards and honors, Dr. Offit was a member of the Advisory Committee on Immunization Practices to the Centers for Disease Control and Prevention, is currently a member of the FDA's Vaccine Advisory Committee, and is a

founding advisory board member of the Autism Science Foundation and the Foundation for Vaccine Research.

He's also the author of nine medical narratives and books, including his most recent, *Overkill: When Modern Medicine Goes too Far*, and *You Bet Your Life, From Blood Transfusions to Mass Vaccinations, the Long and Risky History of Medical Innovations*.

Katie Greene is a visiting policy professor at the Duke-Margolis Center for Health Policy where she focuses on issues related to the COVID-19 response, vaccine policy, opioids and substance use disorders, and other public health issues.

Prior to joining Duke-Margolis, Ms. Greene served as a program director for the National Governors Association where she supported governors in the public health response to the COVID-19 pandemic, issues relating to data driven reopening strategies, and public health infrastructure.

In addition, Katie was the NGA's co-lead of a joint health and public safety opioid response team for governors, governors' staff, and states

on addiction and substance abuse.

Previously, Katie served as senior policy advisor and associate director of the Office of Intergovernmental and Public Liaison at the White House Office of the National Drug Control Policy, and deputy director of federal relations for Arizona Governor Janet Napolitano.

She holds a master's degree in public policy from the Princeton School of Public and International Affairs and a bachelor's degree from Duke University.

Dr. Julie Swann is the A. Doug Allison Distinguished Professor and Department Head of the Fitts Department of Industrial and Systems Engineering at North Carolina State University.

She is an affiliate faculty of the Department of Biomedical Engineering, which is joint with North Carolina State and the University of North Carolina at Chapel Hill.

Prior to joining North Carolina State, she was the Harold R. and Mary Anne Nash Professor in the Stewart School of Industrial and Systems Engineering at the Georgia Institute of Technology

where she co-founded and co-directed the Center for Health and Humanitarian Systems, one of the first interdisciplinary research centers on the Georgia Tech campus.

In her work with CHSS and following, Dr. Swann has conducted research, outreach, and education to improve the void that health and humanitarian systems operate domestically, in the U.S., and internationally.

She has been conducting analysis of the epidemiology and public health impacts of the disease spread of a pandemic, including influenza, 2007 to current, and COVID-19, 2020 to current, with colleagues from Georgia Tech and North Carolina State.

In 2009 to '10, she was on loan to the CDC as a senior advisor for the H1N1 pandemic response.

Currently, she's leading a team selected by the CDC and Council of State and Territorial Epidemiologists to develop forecasts and decision models to support state decision making during the COVID-19 pandemic in the U.S.

Dr. Noel T. Brewer is a professor of health behavior at the Gillings Schools of Public Health at the University of North Carolina. He studies health behaviors that prevent cancer.

Dr. Brewer's current work focuses on increasing HPV vaccination, improving tobacco warnings, and encouraging appropriate use of medical screening tests.

He chairs the U.S. National HPV Vaccination Roundtable and participates in several international collaborations related to vaccination research and practice.

Dr. Brewer co-edited the U.S. FDA's book, *Communicating Risks and Benefits: An Evidence-Based User's Guide*.

We're going to hear from each presenter in turn, then have time for questions from all of you in the audience. As a quick reminder, if you have questions, please type them into the Q&A.

Dr. Offit, over to you to kick things off.

DR. OFFIT: Thank you very much, Dr. Mullen. What I was asked to do was to speak briefly

about sort of vaccine skepticism as these SARS-CoV-2 vaccines are about to be released, so here's what I would say.

In October, there was a poll conducted by STAT-Harris asking the question of Americans would you receive a COVID-19 vaccine if offered, and about 50 percent of people said no.

This worried a lot of people, that we wouldn't ever be able to get to herd immunity inducted by vaccination if that many people weren't going to get it, but I don't think that's the right question.

I think what you were really asking when you asked that question in October was would you get a theoretical COVID-19 vaccine because there was no COVID-19 vaccine at the time.

The better question is would you get these current mRNA vaccines given what we know so far? I mean, I'm on the FDA's Vaccine Advisory Committee. We will be sitting down tomorrow to make a decision about Pfizer's vaccine. Next Thursday, we're going to be making a decision about Moderna's vaccine, but here's what we know.

We know that these vaccines appear to be 95 percent protective against disease, meaning mild, moderate, to severe disease, appears to be 90 to 100 percent protective against severe disease, and in the Moderna trial, there were 30 cases of severe disease, all in the placebo group.

It also appears to be between 90 and 95 percent protective for people who are over 65 years of age. It is remarkable actually, that within a year of first identifying and sequencing this virus, that we've had two large-scale clinical trials with 30,000 and 44,000 people that have shown a remarkable level of efficacy.

Regarding safety, we know that at least all of these patients, well, not all, but half of the patients in the vaccine group have been followed for two months after dose two and there doesn't appear to be any at least relatively uncommon severe side effects.

So, I think it's reasonable to be skeptical of anything you put in your body, including vaccines, but I think that if you're given those kinds of data, that kind of information, that should

calm fears. Now, that said, I think that it's going to be a rough road.

You had already in the UK -- I don't know if you follow this story. Yesterday, the United Kingdom found that there were two cases of severe allergic reactions in patients who had previously had severe allergic reactions, and so then they said that really everyone who has ever had a severe allergic reaction should not get this vaccine.

If you actually look at the number of people in the United States who carry EpiPens, that's about 50 million people, so that, I think, was an unfortunate move on the UK's part because I think it just scared people and scared them unnecessarily.

It would have been more, I think, reasonable to actually look a little more carefully at those two patients to see what component, if any, in that vaccine that was the cause of an allergic reaction.

So, I think that's just step one. If you look at the Pfizer data which is published, both by the Pfizer submission as well as the FDA's

review of that submission, there were four cases of Bell's palsy in the vaccine group, but none in the placebo group.

And so thus, we have the kind of tyranny of small numbers out of a large database, and that's going to be something we're going to have to deal with too, but in both cases, there's going to be pharmacovigilance studies when these vaccines launch to see whether or not these, at least initial problems, hold up.

I think that there's a difference between skepticism and cynicism. I think while it's reasonable to be skeptical, it's not reasonable to be cynical.

The anti-vaccine activists basically are conspiracy theorists. They don't believe any data that is generated by the pharmaceutical industry or the government. They just believe there's a conspiracy to hide the truth, and so there is no convincing them, and they had a disproportionately loud voice given their numbers.

I think that as Neil deGrasse Tyson says, if you come to your conclusions without using reason

or logic, reason or logic is not going to talk you out of them, so that's not a group I think that you'll ever be able to influence.

But I think it's reasonable to be skeptical. I think everybody that's going to sit around that table at the FDA Vaccine Advisory Committee meeting tomorrow is a vaccine skeptic. We want to see the data.

And I think the challenge for us, I think, as this vaccine rolls out is going to be to make it clear to people what we know and what we don't know, for the things that we don't know in terms of long term efficacy, meaning, you know, six months, a year, two years, in terms of whether there is a serious side effect problem when we go from 10,000 or 20,000 people to 20 million people, that we will be looking, that there is a humility that has to be associated with this endeavor because messenger RNA vaccines are a novel vaccine strategy. There is no commercial equivalent.

So, that would be my advice. I just think we have to be transparent about what we know and what we don't know, and make sure people

understand that when you launch a medical product, it's not because you know everything.

You have to answer the question do you know enough? Do you know enough to say that this product appears to be safe and effective as far as we know?

So, thanks for your attention, and I turn it back to you, Dr. Mullen.

DR. MULLEN: Thank you, Dr. Offit, for taking us from theoretical vaccine to where we are with real vaccine now. I'm going to go to Katie Greene and ask you to please tell us about the report you released today on state vaccination plans.

MS. GREENE: Great, thank you, Dr. Mullen. Hi, everyone. My name is Katie Greene and I'm a visiting policy associate at the Duke-Margolis Center for Health Policy.

I'm so pleased to be participating in this conversation at such an exciting time in the fight against the COVID-19 pandemic. We can go to the first slide. Can we go to the next slide? Next slide? Great.

So, with recent news indicating that

wemightbe seeingvaccinesbeing approvedand shipped even as early as next week, I want to talk about how states are planning for and addressing critical issues around allocation, distribution, and administration of the COVID-19 vaccine, but before I really dive in, I want to touch on what exactly is the state role in COVID-19 distribution.

So, states, territories, and a handful of large cities that will receive their vaccine allocations directly from the federal government are responsible for what we call the last mile of vaccine distribution.

For COVID-19 vaccine, that will mean allocating vaccines received by Operation Warp Speed partners, managing systems for ordering, distributing, and monitoring vaccine administration, working with a variety of providers, health systems, and other partners to support widespread access and uptake, and finally, communicating with the public about issues like availability, efficacy, and safety.

All jurisdictions were required to submit detailed vaccination plans addressing these

issues to CDC in October. Can we go to the next slide?

As Dr. Mullen mentioned, hot off the presses today, to understand how states were addressing some of these key challenges and share promising practices across the country, Duke-Margolis partners with the National Governors Association and the COVID Collaborative to undertake a qualitative analysis of all publicly available state and territorial vaccination plans.

By taking a look across all plans, we hope to identify common themes and challenges, highlight innovative approaches that states are using to address these challenges, and offer considerations for governors and other state leaders to guide ongoing planning.

One thing I do want to mention is that this is a fast-moving environment, and states are constantly updating these plans based on new information.

We recognize that what we looked at were interim drafts that will continue to be updated and refined, and not all planning details may be

reflected in these public documents, but we do think a point in time snapshot can really give us some insights into how states are addressing critical issues. Next slide?

The first thing I want to talk about are really some common challenges that we observed across state plans. Some are more cross-cutting.

Others might be more limited to regions or specific to unique state populations, conditions, or infrastructure.

One of the major challenges we really observed is in capacity and funding to execute a mass vaccination effort of this size and complexity.

To date, states have received about \$200 million to support these activities, and recently, public health leaders from the Association of Immunization Managers and ASTHO estimated that approximately \$8.4 billion would be needed to support program activities like building data systems, supporting mass vaccination clinics, ensuring appropriate cold storage and transportation, procuring PPE, funding communication efforts,

hiring additional workforce, and other needs.

And while funding is a really critical need, a number of states really highlighted the need for ongoing federal guidance, information, and resources to support these ongoing challenges that I mentioned above.

We also took -- I'm still on the previous slide, thanks. Within the plans themselves, states highlighted a couple of really unique challenges that we saw across many states or just a few.

The first is limited public health and provider capacity. That's really been strained through the pandemic. A lot of states highlighted really persistent technology concerns related to information sharing, privacy, and the implementation of new, sometimes untested federal systems, limited ultra-cold storage and other logistical challenges.

A number of states highlighted a lack of public confidence in the vaccine approval process or vaccine hesitancy, and then a couple of ones that were really a little bit unique to certain conditions.

A number of rural states mentioned the additional cost and complexity of reaching hard to reach populations in rural areas, border states that share a major metropolitan area with other states, and how do you deal with things like allocation or tracking if you live in one jurisdiction and work in another, and lastly, weather and how do you support adequate social distancing when you're not as readily able to do things like drive-thru testing?

So, in terms of how states are addressing key challenges, I know one that's really at the top of everyone's minds right now is how states are thinking about allocating initially limited allocations to critical populations.

At this point, and Dr. Offit mentioned, ACIP has recommended that initial allocations will be prioritized for healthcare personnel and long term care facilities.

We can expect that essential workers and adults with high-risk conditions will also be prioritized in phase one, but states really do have significant authority in adapting these

recommendations to their own states and how to sub-prioritize when vaccine is limited.

There are over 100 million adults with high-risk medical conditions, for instance, so states are going to have to make some tough decisions when it comes to how to prioritize limited vaccine.

According to their plans, we observed that states have developed really a variety of approaches. At least 12 of them have developed specific committees to help make these allocation decisions.

A number of states are leveraging other vaccine implementation committees or seeking stakeholder input to inform these decisions. Other states really within their plans set out somewhat detailed priorities or methodologies for how they're going to prioritize some of these populations.

I know one state said that they would be prioritizing high-risk populations within each category, or some states have decided to prioritize first responders in that first batch of vaccines.

Lastly, a number of states are using data to further prioritize where they allocate

limited vaccines, so directing vaccines to areas with high rates of transmission or where there are identified areas with significant health disparities.

So, all of this being said, this is a really rapidly changing information environment as additional recommendations come in, so states are trying to remain as flexible as possible to new information as information on efficacy, supply, and demand come into play. Next slide?

So, I think we're all aware of some of the complexities and challenges that may be unique to these particular vaccines. I think Dr. Swann is going to touch on some of this, but I did want to focus on how states are really dealing with shifting distribution strategies as more and more people are eligible to receive the vaccine.

The CDC has projected what we might expect to see in terms of supply here on the left, with a period of initial limited availability, followed by really substantially increased supply in 2021.

In phase one, the vast majority of distribution will occur in closed points of

dispensing, primarily in healthcare settings, long term care facilities, and a limited number of mobile distribution points.

But as availability and the number of eligible people increases substantially in later phases, states have outlined strategies to push vaccine and really engage hand in hand with a wide variety of partners to ensure that vaccines can get out to populations that might be harder to reach.

State plans have outlined some really creative and unique strategies for using mobile distribution, leveraging drive-thru testing infrastructure, and partnering with community organizations, really incorporating a number of lessons learned from H1N1 and recent hepatitis A outbreaks. Next slide?

So, I won't get into this in-depth, but a really critical challenge that states addressed at length in their plans is the need to scale or augment the immunization data infrastructure required to manage, track, and report vaccine information.

States already have existing

immunization information systems to track seasonal and routine vaccine administration, but many of the systems may need to be scaled or augmented to support critical tasks like provider enrollment, vaccine ordering and inventory management, second dose reminders, as well as tracking administration and reporting to federal systems.

Across plans, states identified challenges around the implementation of new, untested technologies and reporting systems, and are also working to address a number of state level legal or regulatory barriers that may prevent, for instance, the sharing of the types of identifiable data that is required by the CDC.

To help bolster these capabilities and provide tools for providers or mass vaccination clinics that might not have access to immunization registries, states are utilizing technologies like VAMS and PrepMod, as well as connecting to the IZ Gateway, which is a federally supported platform to share data with the CDC or other jurisdictions.

In addition, the states really outlined pretty detailed plans for sharing publicly available

data, dashboards to track and share vaccine administration data with the public, including critical demographic data that can help track vaccination uptake among critical populations. Next slide?

So, the last thing I want to touch on is the role of states in promoting equity in the vaccine distribution process through meaningful engagement of at-risk communities.

We know that the COVID-19 pandemic has had a disproportionate burden on communities of color, many of whom may face additional barriers to vaccine access or demonstrate significant hesitancy toward a COVID-19 vaccine, really reflecting historical and ongoing discrimination in the healthcare system and beyond.

Across state plans, we saw a range of approaches and strategies for supporting equity.

A number of states made equity a guiding principle of their planning efforts and outlined plans to work with state equity task forces or other bodies in the state engaged in this work.

Others identified strategies for

programmatic monitoring to assess and remove barriers related to accessibility such as transportation or wait times.

Lastly, states really detailed the different ways in which they're working to partner with trusted community leaders, as well as community and faith-based organizations to minimize misinformation and increase public acceptance, particularly among communities of color.

In some cases, this has occurred in a variety of ways. Some states have allocated grants to community-based organizations. Others are focusing on listening sessions and development of linguistically and culturally appropriate materials.

Others are really advancing collaborative partnerships and planning to ensure that voices are heard and incorporated into decision making.

So, while strategies to engage unique populations within states are going to be extremely localized by definition, ensuring collaborative planning will really be essential to reaching these

critical populations and addressing challenges that arise. Next slide?

So, again, thank you for having me here today. In terms of key takeaways, I just want to emphasize the importance moving forward of adequate resources and support, the need to identify criteria for allocations that are based on federal recommendations while still being responsive to state needs, ensuring that critical coordination structures are in place to adapt and shift strategies, the importance of deploying and testing data and reporting systems, and lastly, the importance of really meaningful engagement and partnership with at-risk communities and planning partners. So, that's it for me. Thank you.

DR. MULLEN: Thank you so much, Katie.

I think you went a long way to help answer some of that question about how things are going to happen and how they can work.

And with that, I'd like to turn to Dr. Swann who can talk to us about the supply chain and what we can expect as the vaccine becomes available in our country.

DR. SWANN: Thank you so much, Dr. Mullen, and Ms. Greene just set it up perfectly.

Next slide, please?

I'm going to talk a little bit about the logistics and supply chain. And I've joked this year that when everybody knows what the supply chain is, that means it's because we've had a problem.

And you've seen it with our personal protective equipment, this whole system from the beginning, where the raw materials start, to the end where the demand is.

As you'll see in the next image, what we're really talking about today for the vaccine is primarily that last mile as it's allocated from the federal government to the state, and local, and other jurisdictions, who then are determining where it's going to go within their organization, and eventually all of these different populations access that vaccine.

Now, supply chains are interconnected.

You have lots of decision makers and you've got all of these things flowing across the system. The product is moving. The information is moving.

You've got people, finances, all of it.

Typically, supply chains are oriented around getting the right product to the right place at the right time, the right customer, at the right cost.

Of course, in public health, there's some additional considerations such as maximizing the impact and preventing lives lost, and reducing disparities, and these kinds of things that are coming into play in the system. Next slide, please.

This is a little bit of information from the H1N1 distribution of vaccine. This picture is the distribution of the uptake vaccine that occurred across states early in the pandemic. I say early. This is about October through December or January.

And you can see that there is a lot of variability in how many people each state were able to immunize in that period of time even though they all had access to the same amount of vaccine proportional to their population.

And recall for H1N1, some of the high-risk groups included children and high-risk adults, and

so those are pulled out separately.

When we looked at each one of the plans for distributing vaccine and what happened on the ground in the state and local jurisdictions, we found several factors that were associated with increased uptake of vaccine.

One of those were a shorter lead time, and specifically the lead time of the time period from when vaccine was allocated from the federal government to the jurisdiction, to when it was actually ordered and shipped from the distribution center.

States have different processes for doing this, and in some cases, that time took about a week, not the first round of vaccine. I think what we'll see if the Pfizer vaccine is approved, if the Moderna vaccine is approved, we'll see those first orders going out the door very quickly because we know exactly where those are going.

But over time, as that decision becomes more complex, some of the states have different processes for working with their providers in determining who gets it next, but if we can do what

we can to shorten that time, that it could increase the number of people who are vaccinated in time to protect them.

One of the other things we saw is that states that sent vaccine to locations that had very broad access, so I include in that pharmacies as well as community clinics, those states also had higher vaccination uptake, for example, among high-risk adults.

So, I think of this as one element of access, whether you can get vaccine after 5:00 or on weekends, and that kind of access can be important for some people to get to the vaccine. Move forward, please.

And one of the other things that we found is that if there's information visibility across the system, which is really hard in our public system because we have a very decentralized system with different decision makers, but if you can have inventory visibility on where that is, then you can make better decisions. Next slide, please.

So, of course, as we've seen coming out of ACIP and the related groups, there are several

principles around the vaccine distribution, and then there are some groups that have been outlined for priority.

So, as you'll see, I will make the link, in this next image, I'll make the link between some of these elements of the plan and the logistics and supply chain distribution.

We can quickly see these arrows that are coming, so inequities. One factor is geographical, race, ethnicity, income, and so when vaccine is being distributed, that's one thing to think about.

Transparency, there we've got the element both of the allocation to states and then the allocation within states. The initial 6.4 million coming out of Operation Warp Speed is being allocated to states on a population basis, but after this set of doses are allocated, it may be allocated in other ways driven also by disease prevalence, demand, et cetera, but ensuring that we have transparency to the American public is an important principle.

Looking at those different groups, you

can see that states are determining where to send vaccine. And so healthcare personnel, they can be reached at hospitals or provider offices.

Essential workers may be able to be reached through employers, and these essential workers can vary a little bit across different states.

Adults with a high-risk medical condition or of older ages, pharmacies is one place to reach them, but there can be others as well. Next slide, please.

And you can show the image as well. So, I estimated the supply of vaccine over the next few months, and this is an estimate. What we're using here is the commitment that the United States has made to each one of the vaccines, and I assumed that a given vaccine, that particular commitment say of 100 million doses, would be distributed over six months.

Now, in the next slide, I also overlay that with the estimates of the size of different priority group populations. So, way down at the bottom, the healthcare workers, that's about 21

million, and then you add in long term care, essential workforce.

If you assume they take the vaccine at a 50 percent rate, then you've got the line there that I'm highlighting with that text. If you add in the population who are 65 and above, then now I'm starting to assume a higher uptake, 75 percent and so forth.

You can see that if all of these vaccines come forward, then we start to have enough vaccine to reach out beyond these first priority groups several months into the vaccine distribution.

So, you know, with this projection and under these assumptions, we'd really start to see that supply loosen up around April. Next slide, please?

This is a picture that illustrates some of this link between the focus on inequities in distributing the vaccine and the geographical allocation that will occur within jurisdictions to individual providers.

This particular map is showing diabetes prevalence by county. It's from the CDC and

published by the U.S. News in this case. There's a wide range at the individual county level from around one percent to over 30 percent, and you can see that there are some areas of the country that in particular have higher rates, so over much of the southeast, for example.

I would also not be surprised if vaccine hesitancy is high in some of these same areas, so a lot of work will really have to go into making sure that vaccine can reach these locations, address that last mile, and address the vaccine hesitancy. Next slide, please.

Here I'm providing some of the specifics that relate to the Pfizer and Moderna vaccine, as well as a couple of the others. You may have heard a lot about the cold chain that's required for the Pfizer vaccine.

In storage, it would need to be kept at -70 Celsius. That is quite cold. That's deep freeze. It's something we don't have at all of our healthcare provider locations.

Pfizer has recently said that they've extended the amount of time the vaccine remains

in good shape in their thermal shipper, which has dry ice associated with it, so it can stay up to 30 days with appropriate resupply of the dry ice on that.

It holds a minimum of 1,000 doses because of the structure of that. So, you can see that it may perhaps be more appropriate for urban locations than rural.

In contrast, Moderna has 100 doses are the minimum for shipment and Moderna recently announced that the vaccine can be refrigerated for up to 30 days.

And so this is one of the things that makes this supply chain more complex. It's more complex than the one for H1N1, although the good thing is that during 2009 and '10, we were able to test all of these systems and delivering more 100 million doses in the first few months of the campaign. Next slide, please.

And moving forward, there are several different supply chain types of strategies that states are using. One is to push supply out, and I'm thinking especially about the Pfizer with some

of the concerns around it, and the size of the box and how many doses it holds.

But one is to have the vaccine arrive at a hospital or regional distribution center and then push out -- that's my timer thing. I need to wrap up -- push out to other points of distribution.

If you can go ahead and show all of the images on this slide?

The second picture at the bottom is using mobile vans. The third one is bringing the vaccine to a centralized location and pulling people in, and the last one is partnering with commercial pharmacies with their infrastructure and utilizing their locations. Next slide?

There is a website if you'd like to contact us for more information on this or the modeling that we're doing on the pandemic and interventions. Thank you very much.

DR. MULLEN: Thank you, Dr. Swann, for helping us envision how vaccine will move and actually make its way to people in communities. Next, I'd like to ask Dr. Brewer to tell us what to expect in vaccine uptake and where there might be issues.

DR. BREWER: So, we've heard a lot about how to get vaccine out there from a supply side, but let's talk about the demand side. What can we do to think about communities, diverse communities, and encouraging them to get vaccines? Next slide.

So, I'll be presenting a model that was originally published in the Journal of Psychological Science for the Public Interest. This model is currently used by the World Health Organization, as well as several key health nonprofits and other government organizations globally. Next slide.

The model is pretty simple. It says there are three buckets of things to consider, what people think and feel, the social world that they live in or social processes, that's in green, and then direct behavior change.

That is trying to change people's behavior without even really trying to change what they think and feel, not trying to persuade them and also not trying to change their social world.

That's the blue box.

So, let's go through each of these and

try to figure out which is going to be most effective as an approach for states to adopt in their efforts.

Next slide.

This is evidence I'm presenting from randomized control trials. So, what people think and feel is not all that effective, at least not in changing what people think and feel along the way to changing their behavior.

So, messages that increase their disease risk appraisal likely have almost no impact. We have a couple of meta-analyses showing little or no impact of that approach. It's surprising, and I think we should probably see the same with COVID-19.

There's no mystery that this virus is out there and that it's deadly, so that's not going to surprise anyone. A bunch of risk communication about that is not going to go very far. Educational campaigns that focus on vaccine competence may not be it either. Decision aids and motivational interviewing, the data are not convincing to me that these are the primary ways to increase vaccine uptake. Next slide.

Now, social processes are indeed

promising. We can develop more messages describing what other people are doing or what powerful people around you want you to do. This is what your parents would want you to do, or this is what your grandparents would want you to do, or this is what a religious or community leader might want.

Social network interventions that build on contagion, contagion being the spread of information among people around you, those are also promising, but have not really been fully vetted in the context of vaccination. Next slide.

So, now let's talk about direct behavior change, and notice all of these dots here are either solid or that sort of medium modest level of evidence, so there's a lot of optimism in this slide.

Healthcare provider recommendations by far are the most important influence on anything going on with vaccines. It trumps everything else.

Presumptive healthcare provider recommendations can also be particularly powerful.

Those are ones where we just sort of assume you're moving forward with vaccination, and then if you

have questions, we pause and slow things down and answer those questions, potentially using reflective listening approaches and so on.

Reminders and recalls, those are effective. They are rarely used well, so they are effective when they're used, but primary practice doesn't tend to actually implement them, so centralized reminder and recall is actually pretty effective.

Implementation intention interventions is just asking people who have already vaccinated in the past if they want to do it in the future.

It makes them more likely by a percent or two. It's small, but that's actually pretty meaningful and very easy to do.

Onsite vaccination, well known to be effective and well developed. Default appointment, I'll talk about in a second, and of course we know about incentives, paying people or reducing the cost, as well as vaccination requirements. Next slide.

So, overall here, we're seeing that the what people think and feel, that persuasion type

interventions are probably not the way to go, and the social process ones are, they're interesting. We don't really have a choice about communicating.

We're going to be communicating as organizations anyways, but where should we spend our time, definitely with this direct behavior change stuff. That's where we should be spending most of our organizational resources to increase demand for the vaccine. Next slide.

So, I'm going to go through this final one just a little more. The idea is that you build on this, is that the idea is that you take people's intentions to vaccinate where they are, the hesitancy that Dr. Offit was talking about.

You take them where they are and then you try to either build on the favorable intentions that people already have by keeping it on their minds with reminders, prompts, and primes, or you try to reduce barriers with logistics or behavioral defaults.

If that's not possible or if you have people who really are just grumpy about it and you

need them to get vaccinated, that's a time when you could consider using incentives, or sanctions, or potentially requiring vaccination, although in the context of COVID-19, it's not something that I'm really excited about, except maybe for healthcare workers. I think the requirements would be very complicated. So, next slide.

So, here's some really interesting data from Dr. Chapman, Dr. Gretchen Chapman, showing that when people are assigned to get an appointment ahead of time, out of the blue, they're just set up for an appointment for a seasonal flu vaccine, their rates are much higher, and that's on the far left, than if they are told that it's available and they have to opt-in to get an appointment or if they get no letter at all.

So, that is an increase in uptake of seasonal influenza vaccination by just scheduling people automatically for appointments. So, the idea of default appointment could pair very well with, for example, worksite vaccination. Next slide.

Now, I wanted to put a big caveat on

this and that is that what people think and feel is not a direct influence on vaccination in any typical sense, in a correlational study. There's lots of correlational studies that show it, but as an intervention approach, it's not the key place to spend our time.

That said, everything that comes out of the mouth of leaders is going to affect confidence, and that confidence in vaccination and the vaccination system will materially influence our ability to do all of the policies and programs that are in the blue box.

We can only do the things that really work if we have high confidence in vaccination, so confidence is essential, and it's essential that we have it not just in some general sense, in actual and specific communities. Next slide.

So, one question that people asked me as I was preparing was whether vaccination will lead people to take additional risks. It's called risk compensation, probably not.

And we don't have a lot of time here, but on the upper right here is a paper from a while

ago with Lyme disease vaccination, showing whether people who get the Lyme disease vaccine are less likely to have (audio interference) and other protective behaviors like using tick repellent and so on, and it's just not really there. If you torture the data, maybe one of the five behaviors shows it.

There's also some recent data in BMJ on mask wearing and looking at how that affects hand hygiene, and there's no negative effect. It might even be a positive effect.

There's also studies in helmet use, and HPV vaccine, and so on, and all of them pretty much tell the same story. Risk compensation really isn't a thing, and with a partially effective vaccine, you worry about it, but with a highly effective vaccine like this, you don't really need to worry so much. The whole point of the vaccine is so that people can begin to take what we now consider to be risks in living their lives as they would like to. Next slide.

So, finally, it is a hope of mine that we can get back to our lives by having family

gatherings, by being together with our communities.

That said, we have to prioritize Black and Indigenous people of color and their communities in order to make this an equitable intervention approach.

So, as we start to develop our communication plans, as we start to think about who our communicators are, it is important we ask these communities who do you trust right now, and those are the people that we should have involved in our communication planning and execution.

We can no longer have only Dr. Fauci up there or Dr. Birx up there. It has to -- the people communicating about the vaccine have to be diverse and meaningfully representative of diverse communities. Thank you.

DR. MULLEN: Thank you, Dr. Brewer. Your closing message actually made me think about how to apply what the evidence has shown might be the best practices with empathy to really make sure that those best practices are as successful as they need to be.

I know we have a number of questions, so I'm just going to ask my first one because one

of the things that I've been thinking about is how many times we have heard for months we need a coordinated national plan. We need national leadership.

And we've been talking today about the challenges, what's going to happen, how it's really going to happen, and every now and then, the messages that our presenters have said are so important don't necessarily come through to the public, which worries me if the public starts to think there isn't a plan and starts to worry about the fact that states have flexibility, but that is the reality for how our government works.

So, everything that we do in this and any other conversation that reminds us that part of that coordination from the national level actually has unfolded over months through the collaboration of CDC, through the way in which the National Academy of Medicine's equitable allocation framework was developed, with discussions with Operation Warp Speed and the ACIP is really, really key because all of that collaboration has created a playbook that doesn't have to disappear now because states

have their own flexibility.

So, for all of our presenters, and I'll put this to all of you, as you think about communication, and supply chain, and state plans, and the vaccines, how do we make sure that that framework that the National Academy and ACIP embedded in equity, and equal regard, and maximizing benefit, and fairness, and transparency doesn't get lost once all of this work goes from the hands of the state officials to hospitals, employers, and others, to local directors? Because that's what our communities are going to feel and that's what they're going to wonder about at the end of the day.

And because you all actually finished in time because I know you want this to be a conversation, I'll go back to Dr. Offit and see whether or not you would like to respond first. If not, you call on somebody else.

DR. OFFIT: I think the two best people to answer that question are Julie and Katie, so I defer. I'm phoning a friend, Julie?

MS. GREENE: This is Katie. I'm happy to jump in first. So, you know, and I talked about

the challenges and I talked about what states were really looking for in terms of resources, and guidance, and continued information.

So, the federal government has played a really critical role in entities like NAM and ACIP really in setting and moving Operation Warp Speed, and setting guardrails around what some of those priority recommendations would be in setting up data infrastructure and reporting systems, and really resources are needed to make all of this work.

I think states are really where the rubber hits the road, and it's all about implementation as we said at the beginning. Part of state plans that I didn't get into all that much is some of the coordination structure that states have really put together, external advisory committees.

I think one thing I harped on quite a bit is the extent to which local health departments, providers, health systems, at-risk communities and providers that serve them really need to be a part of those planning operations to really make sure --

I think the benefit of having different state approaches is that they are able to craft solutions that make sense based on their own infrastructure, and resources, and relationships that are already there, but, you know, certainly some variation that could cause some distrust or concern with the public.

DR. MULLEN: Thanks.

DR. SWANN: I'll add onto this question.

I love this idea of phoning in a friend on the panel when you think someone else should answer.

There are a couple of ways that these frameworks around equity and fairness get codified into processes. One is that you start to see it in these state plans if you were to go and read it.

A second is that when vaccine is chosen at a point in time to be sent to a particular provider, often that provider may have greater access for a population.

So, employers and unions is a great example. When you're trying to reach essential workers, you can send to the utility company and

work with those organizations and you're reaching essential workers.

It gets harder as you move into categories that are harder to identify like people with high-risk conditions. You know, I think that in many states, providers have been asked to do what they can to do that screening and ask people to participate in that way, and, you know, if you fall into whatever priority group it is.

I don't think that somebody is going to go to jail, you know, in this kind of scenario, but we previously have had priorities on vaccine and there may have been some isolated cases where it didn't work out, but we did see in 2009 that this vaccine was directed to these people with high-risk conditions and that they were getting vaccinated at much higher rates than others.

So, the system has shown that it can work and it has several different elements across these different stakeholders and decision makers where that happens.

DR. BREWER: If I can add something, I have heard from colleagues a concern that the

healthcare system that we currently have systematically excludes some groups of people. Those include rural people, and Black and Indigenous people of color, and because they're excluded, and it's not universally and not all people, but they are less likely to have access, and when they do get access, they may also be treated with less respect or treated in ways that make them feel like they don't want to continue engaging with this particular healthcare system.

So, we're going to have to work with the system that we currently have. There's no question about that. I think it's also important for states, as they develop these plans, to ask themselves the question are these equitable rails that we're riding on?

The communities that we most need to reach, are they truly going to be able to be served by these resources that we have? So, for example, pharmacies are seen as being a panacea, and I agree.

They will do a lot, but pharmacies specifically exclude certain rural areas and certain

Black communities. They are less well served, and so there is an opportunity to interrogate some of these systems that we have right now as a way to ensure equity across the United States.

DR. MULLEN: Thanks, and I know that for the National Academies, during our public meetings, we heard explicitly from leaders from the National Medical Association, the National Hispanic Medical Association, and a number of other national physician organizations not to forget that there are lots of doctors out there in communities who are exactly the kinds of communicators, trusted communicators and vaccinators that ought to be considered as partners, and there is work going on.

I've also heard from state health officials about how they are being even more intentional using maps and data, and understanding vulnerability in communities similar to the map that Dr. Swann showed using indices like social vulnerability to be able to also say we won't ask people to come to us. Let's make sure, with a good supply chain, that we can actually take vaccine

to where it's truly accessible.

And we do have a number of questions, so I'm going to then take this one from the audience that is somewhat related. Tribes should be recognized as government entities who have the authority to create their own distribution plan regardless of what state they live in.

This is their legal right, however, and many state plans do not explicitly state this, creating misconception that Tribes should be treated as high-risk minority groups instead of -- which is not an equitable practice.

How to ensure that Tribes are properly represented in their government to government relationship with vaccine distribution plans? This includes how they are or not referenced in discussions about this issue.

So, I was reading the question, so, Katie, you probably couldn't see me looking at you as I was reading it.

MS. GREENE: Yeah, and I'm so glad that that issue was raised. You know, the state vaccination reports were very lengthy, as was our

report, and I had a lot to jam in, but this was an issue that we did address within our report.

And, you know, obviously states addressed it in a variety of different ways depending on what Tribes they have in the state and how they interact with them.

It is worth stating that as sovereign tribal governments, Tribes have the option to receive their own allocation directly from the government, so that is sort of question number one when the state is having a conversation or consultation with those Tribes about how they prefer to receive that vaccine, but states really did sort of outline a variety of different ways that they were working with and engaging Tribes.

Also, I should note that Tribes that are not federally recognized may not be receiving those vaccines, so it's very important that they have those conversations about how to reach communities at their usual source of care, at places that are convenient, and that includes urban areas that might not be served by IHS facilities.

Sort of beyond that, I would just harken

back to the point about, you know, meaningful engagement and incorporation into decision making.

We had and highlighted a couple of really great ways that states were incorporating Tribal representation into some of those committees, and Alaska in particular is doing some really interesting and great work in building resources and toolkits for Tribal communities, as well as working with the health consortium to ensure access in the more rural areas.

DR. MULLEN: Thanks. Does anyone else want to weigh in or -- that's a great answer. Thank you. And I just want to clarify, I've been able to find plans for every state I've looked for online.

Is that true for every state, they're all accessible?

MS. GREENE: Yes, and I dropped a link to our report, but in the back of our report, we have -- as I said, they're being updated all of the time, but I think we had 48, as of last I checked, states that had published their full reports, and then the CDC has executive summaries for all states and other jurisdictions that might not have published their full report.

DR. MULLEN: Okay, so, thank you. Okay, so I'm going to phone Dr. Offit. You've already touched on this in part in your remarks, but it was the first question that came in asking about the likely common side effects associated with the vaccines, how we communicate them to people, that there will be some side effects, and potentially adverse effects?

DR. OFFIT: Right, so there are definitely side effects associated with this vaccine, more so after the second dose than the first, more so in people less than 65 than over 65.

The side effects include fever, including occasionally high fever in about 10 or 15 percent of people, but then as many as 40 to 50 percent can have fatigue, headache, chills, muscle aches, enough that they could possibly miss a day from work.

So, the CDC has advised and our hospital is following that we wouldn't, for example, immunize the entire emergency department staff on one day for fear that they all may miss work the next day,

so that is true.

I do think though that you need to see this for what it is. I think that the immune response needs a better public relations team because this is just what happens when you respond to, in this case, a foreign protein, the SARS-CoV-2 spike protein, which is essentially translated from that messenger RNA.

When you respond to a natural infection or you respond to immunization, your immune system makes a series of proteins like cytokines that cause side effects. That means you're having a vigorous immune response.

I have a friend -- I'll finish with this story. I have a friend in North Carolina who volunteered for the Pfizer trial, so he didn't know whether he got vaccine or placebo. After the second dose, the next morning, he woke up and had fatigue, headache, looked to his wife and said, yes, I got the vaccine.

I think that should be more people's attitude, that this is just your immune response working is all that is. The terms that always

surround it bother me a little bit, adverse events, side effects. It's just symptoms associated with an immune response.

DR. MULLEN: Thanks.

DR. BREWER: I'll add that I agree that there are not really side effects in the way that we typically think about them.

People will often equate the term side effects with serious adverse reactions. Something that's lifelong. Something that could even be life threatening.

These are routine reactions that your body has. And that are in some -- maybe they're indicative of the vaccine working. I like that way of thinking about it, and it does match people's way of thinking about vaccines.

But regardless, the language that the North Carolina plan is starting to use is reactions.

DR. MULLEN: Thank you. So, I'll ask this follow up question then for anyone.

As we think about the most effective strategies for addressing skepticism and helping people move from their considerations about

vaccination, any other -- any other messages that we should put in there?

Or, is there any use as we talk about the normal reactions that people have to vaccinations that we just need to help people hear?

And from a public health perspective, I'm thinking about this for COVID and all the other vaccines that we wish people would get more readily anyway.

DR. OFFIT: So, I'll start, I guess. The -- I think the health requirement here in part is the use of the term emergency use authorization.

This vaccine is going to be approved in the same manner that hydroxychloroquine was approved, which not only didn't work to treat or prevent the disease, but in fact, had a dangerous side effect, which is to say, cardiac toxicity.

And the same thing with convalescent plasma, which had not been shown to work. At the time that it was clear that sort of the FDA seemed to be ceding to the whim of the Administration.

So, this is going to be approved through the same methods then. The irony though, is these

are very well studied products.

I mean, the 30 thousand to 44 thousand person phase three trial is typical of any pediatric vaccine. I mean, human papillomavirus was a 30 thousand person trial. The pneumococcal vaccine was a 35 thousand person trial.

So, it's a typical size. The only difference is length of study. That's the only difference.

Following people for two months after dose two, will pick up any major serious side effect.

The difference is, you're only going to know this vaccine is effective for a few months.

So, that's really the difference. And I think that's what we need to get over. We need to try and explain to people that although this was developed very quickly, the one thing that wasn't done, that wasn't truncated was that phase three trial.

The proof is in the pudding. That's the pudding. And I think we need to say that over and over again.

But, it's a hill to climb. To be

perfectly honest with you, I probably shouldn't say anything political, but I keep thinking to myself, I hope that President Trump doesn't say anything about this vaccine.

Just don't tout this vaccine, because I think people don't see him as the science President. I'll put it that way.

DR. MULLEN: Thanks.

DR. BREWER: In terms of how to communicate with skeptics, it's complicated. The best person to do this is the healthcare providers.

Someone you already have a healthcare relationship with. If that person's unavailable, then it's going to be someone else, someone else who you go to see.

But, if you're a healthcare provider, one of the most important things to do is ask people, what's your main concern?

What is your main concern? Often the patient won't know, or will have something vague. So, regardless of what they say, what's your concern, right?

You say, is that your main, you know,

what's your main concern? So, come back to them that second time to really get the worst thing on the table.

Because until you can answer and address that whatever nightmare scenario that's in that patient's head, things aren't going to get better in the conversation.

And once you knock that thing down, and once you start to set their mind at ease, then they can move forward. So, that's the first thing to do.

The second thing is to show you listen.

So you ask them the question and you actually listen.

And you show that you listen by saying back to them what you just heard. I see, so you're concerned because you heard that there were allergic reactions that a couple of people had.

All right. Well, here's what we know.

And that's when you go into the science. But notice there's a long period of time there where you're not talking.

You're listening and reflecting back before you even get to answering questions. At

that point then, you probably can get back to saying, I'd like you to get this vaccine, because it's going to protect you and your family.

DR. MULLEN: Great. Thanks. So, I have two follow ups prompted by questions from our audience.

And so one of those is the follow up discussion that you have with the person who did okay with the first administration and needs to come back for two, number two.

How do you get them back? And you know, I understand that for young adults who get their first HPV vaccination for example, not all of them return for their second.

So, that's the first question. Strategies for making sure that people come back.

But beyond the information technology and monitoring piece, but also that communication.

And then I'll go to the next question that came up.

DR. BREWER: Do what dentists do. Just make an appointment before they walk out the door.

So, they need to already be scheduled.

That's the most straightforward thing. It's also not the main concern with HPV vaccine. A lot else is going on by getting people to the door.

But, most people do come back. If it's not in the short term, it's some point later on.

Reminder, we all can also lead to take various forms of reminding to come back honestly.

Just bake into the system so they don't get out the door. Maybe they don't even get the vaccine until they're scheduled for their next appointment.

DR. MULLEN: Thanks. Okay. And then flipping the focus to the vaccine administrator.

Any comments on addressing the potential skepticism of the providers that we're also hoping would be the great communicators providing the incentives for people to come in?

DR. OFFIT: Yeah. I think that's a little bit of a surprise. That, you know, there are certain polls of doctors and nurses that there clearly is a fair amount of skepticism.

The way I see this playing out is that -- that as Katie said earlier, the first tier group

is going to involve 21 million roughly, healthcare workers.

And then another three million people who live or work in long term care facilities. That's a huge base of safety. That's a huge portfolio of safety.

And I think people when they see that millions of people hopefully, have gotten this vaccine without any sort of rare or serious side effect, it's going to be a lot easier moving forward.

That's my sense.

So, this is a -- it's like the Beanie Baby phenomenon. This is a limited edition vaccine initially. And I think that may make it perceived to be more valuable.

DR. MULLEN: Thanks.

DR. BREWER: And it's true that physicians listen to other physicians. So, we need to get AMA and A -- well, AAP, I guess, isn't part of it yet.

But, get the American Medical Association and some of the specialist organizations out there and talking. That's one thing.

A second is, we need to be able to tell stories. People, medical professionals don't always pay attention to all of the details of some of the impacts these diseases are having.

It's probably not subtle for them. But, this is the second approach to be used with HPV vaccination, to be sharing stories of patients. So, those too.

Having experts, and if it's physicians to physicians, it could also be nurses to nurses, or other healthcare professionals, for example, pharmacists to pharmacists.

DR. MULLEN: Okay. Thank you. We have some other supply chain related questions.

First is, how much of a concern is supply chain security in terms of transportation and extreme temperatures? Especially for rural areas this seems to be a big concern.

DR. SWANN: Great question. I know that all of the major industry players are certainly looking at this.

And I consider, you know, you've got the commercial pharmacies, UPS, FedEx, McKesson

Distribution Center, manufacturer. States have the option of working with their National Guard if they think that it's necessary.

I've not seen a lot of evidence that I think a lot of people are going to go to that level on the security side.

What I'm expecting if Pfizer and Moderna are both approved, I think that Pfizer could get sent to urban areas more often, Moderna more often too rural because of the size.

And that will help alleviate some of the infrastructure needs on the rural side since Moderna can be refrigerated for up to 30 days.

If there's a supply of dry ice available, that is also an option to use the Pfizer vaccine in rural areas.

And I wouldn't be surprised if we see some mobile clinics operate to try to make sure that we're reaching everybody we can.

Because certainly, you know, all of the states and local jurisdictions and others are quite aware of the infrastructure differences, and the concern to make sure that we're not driving additional

inequities by thinking about the cold chain.

DR. MULLEN: Thanks. Okay. Talk about not wanting to drive additional inequities. There are some con -- I'm not making this up. The questions are coming in this way.

There really are -- there are concerns that we're hearing at the state level about sharing detailed personal information for those who are getting vaccinated.

And so, do you have, any of you, have thoughts about how to balance the need to ensure equitable allocation and distribution against the protection of personal privacy?

DR. BREWER: Every state, I think except maybe New Hampshire, has an immunization system, an immunization information system.

And these IISs are well planned. They're well executed. And they support the backbone of adolescent and childhood vaccination in America.

We can use those and rely on them. There's other ways we -- other information systems we're going to rely on.

But, that's the primary one that could

be partic -- that will be particularly useful here.

Those are great systems. They're well protected.

And they serve us well.

MS. GREENE: I would agree with everything Dr. Brewer said. These are well-tested systems that have been used for decades.

I mentioned earlier in my remarks that the CDC is requiring identifiable data. There are a number of states that have specific laws or regulations that prevent sharing of that data either with the CDC, or place conditions around how they're able to share with other jurisdictions.

I think that's a really thorny issue right now that states are trying to deal with, and are asking for some additional information about how that data is managed and stored at a federal level.

It's my understanding that CDC is not storing that data ultimately in what they call the data lake. But, it's going to be used to deconflict information streams that might be coming in from different systems.

If one comes in through a pharmacy chain,

it will be -- it might be a different system than a state immunization registry.

But, there are a lot of issues to be worked out, I think.

DR. MULLEN: Thanks.

DR. BREWER: And maybe it's worth saying that the immunization registries we have, are great, these IISs. But they don't always fully talk to electronic health records that are part of large healthcare systems.

And so there's multiple places where information gets stored. And when there's duplication, that can lead to all sorts of problems.

So we're not at the point of having a single system across the U.S. And even within any one state, there can be a dozen systems.

And having those systems all funnel up to a national organization and not have that turn into utter chaos, it's helpful to have identifying information.

DR. MULLEN: Thank you. Thank you. So, early on we talked about supply and demand, and the mismatch.

And we know that there is the potential for sort of what I'll call a two dimensional on paper plan for getting the vaccine to people. But, people don't necessarily show up in sequence in the way in which we expect.

And sometimes those who might be a 1A or 1B persons shall I say, in a phase, might not be ready until some of the phase three folks are getting vaccinated.

Do, any other thoughts about the ways in which states and communities can continue to let this be a dynamic and not just a sequential process?

Because in my mind, I see this system's dynamic map that's all over the place as opposed to something very linear. And that could either be a challenge, or just the kind of complexity that public health connotes all the time.

DR. SWANN: I think you will see that there will be dynamic changes. And they won't occur at the same time in every state.

Some states have a larger population of adults with high risk conditions. And I view

it as anybody who has been on the list before, let's say a healthcare worker, would be able to come back in the next round.

But, if I'm a young adult who is college age, who has no high risk conditions, I might be asked to continue to wait. And this would be communicated through a variety of messaging coming out of that jurisdiction.

DR. MULLEN: Thanks.

MS. GREENE: I'd say it also bears repeating that there's a lot of overlap in these groups as well. Obviously communities of color are over-represented in essential workers and healthcare workers.

And this is, I think, going to be an ongoing challenge. And I think one of the things that states have really explicitly tried to plan for is what they call different demand scenarios.

So, you know, there's going to have to be some critical decision making about when you move from one phase to another. Or when you make that next group eligible.

So, I think it's just a matter of being

flexible and responsive in responding to challenges as they come up.

DR. BREWER: And maybe I could take up on a little piece of the question. Which is that, not everyone has a tidy life.

Some people have complicated lives. Very complicated lives that COVID has made even still more complicated. Working multiple jobs, having children in the home without maybe -- with only maybe one parent there. Or maybe having community members helping out.

And it could be overwhelming to think about having a doctor's appointment for this thing that they don't really fully understand.

So, sort of expecting to turn on a switch and having everyone lining up, is not how it's going to work. For many people, especially -- for many people.

So, I do like the idea of multiple redundancy. The idea that we have multiple opportunities to get the vaccine.

That it's not just, here's your one chance. And you get it or you don't. But, if you

don't get it now, then please come back at this other time.

Or there are three opportunities. If this doesn't work, we're going to have to try this opportunity. And if that doesn't work, we're going to try this opportunity.

I -- my -- I'm not close enough to the supply side thing to understand how this is playing out. But, my understanding is, is that that sort of spirit is present here.

DR. MULLEN: Thank you. And in the same way that it seems so nice and ordered on -- in the two dimensional paper, or onscreen plans, the other -- the other piece that I think about is, how right now, as we tell people don't worry, because we're going to have a vaccine.

Maybe not we, but this message is coming out, as our questioner put it, the cavalry is on the way. How do we -- how do we -- and this can be for all of you, because there are multiple stakeholders who need to be excited, and as I'll put it, wait. Or curb their enthusiasm.

So, how do we message that and keep

everybody onboard for this whole continuum of vaccine administration that we're talking about?

DR. SWANN: Dr. Mullen, you are exactly right. We have to be patient. It's not only that the supply may come out slower than what I showed in my picture, but we also have to be willing to continue wearing masks and do some distancing.

We can't just think the vaccine is going to be here and it's going to work. We've been running simulations on that. And that would be a huge mistake if we immediately started lifting all of those interventions.

DR. MULLEN: Thanks.

MS. GREENE: I would just echo the point about the need to continue to emphasize the importance of masks. We know this is going to be a long haul.

You know, one thing that we -- I don't think we spent a lot of time talking about, is just the public information campaigns that are going to happen.

And I think communications is really going to have to be a multifaceted front. So, we're seeing a lot of investment and probably much more

needed in terms of public information campaigns, especially those that might be targeted at particular groups.

There is a need to really engage and provide current timely good, easy to understand information to trusted messengers.

And then there is the role of state leaders and policy makers in communicating with the public the way that they have, in clear, transparent, and understandable terms. Really the way they had to throughout the entire pandemic.

This is a -- this is going to be an ongoing project.

DR. MULLEN: Thank you.

DR. OFFIT: Can I --

DR. MULLEN: Yes.

DR. OFFIT: I just want -- is the two trials that are done, the Pfizer and Moderna trials, were designed to determine whether or not the vaccine prevented disease.

They weren't designed to determine whether or not the vaccine prevented asymptomatic infection. Or said another way, contagiousness

in people who don't have symptoms.

Those studies will be done early next year. They're already being planned. But really, even if you've gotten the vaccine for now, you probably still should wear a mask and social distance, because you may not be protected against asymptomatic showing.

DR. MULLEN: Oh, so please don't turn off your mic Dr. Offit. This question is directed to you.

Many questions have come in about the messenger RNA vaccine. Can Dr. Offit explain how the mRNA vaccine is different from existing vaccine formulas?

And if you have best practices for talking about MRA -- MRNA, since it seems to be the source of a lot of misinformation?

DR. OFFIT: Yeah. The difference between an MRNA vaccine and the other vaccines that we've been using, is you don't give in this case, the protein you're interested in.

And the protein you're interested in is the SARS Cov-2 spike protein. That's the protein

that binds the virus. The cells or antibodies to that protein will prevent infection.

So, other strategies whether it's a live attenuated viral vaccine, or an inactivated viral vaccine, or a subunit vaccine, you give the protein at some level. Here you don't.

You give the gene that codes for the protein. So, because messenger RNA is an incredibly labile molecule, and if you just injected people with messenger RNA, it would be disintegrated quickly by the raphe nucleus in our body.

What you do, is you put it in a little lipid nanoparticle. That protects the messenger RNA.

It also allows cells to take it up. So when the cell then takes up the messenger RNA, it goes into the cytoplasm, it enters the so-called ribosomal system, where it is translated to a protein.

And so your body makes the SARS Cov-2 spike protein. And your body makes antibodies from the protein.

The thing that worries people the most, I think messaging wise, is you're giving a gene.

And so when people hear that, they think, I'm going to alter my genome.

But remember, your genome, the DNA is in the nucleus of the cell. It's not in the cytoplasm of the cell. And it's virtually impossible for the messenger RNA to get into the nucleus.

I mean, when you look at the DNA vaccines, where again, you're giving sort of a naked piece of DNA, those are given by a so-called electrophoretic gun. You know, where you basically give a shock to the muscle in order to open up that sort of nuclear cell.

And it's hard to get things into the DNA. But that's what people hear. They think that they're going to be genetically altered. And somehow that's going to be awful.

Although nobody ever thinks that their genes are being altered and that they would like to get X-ray vision or become Spiderman. Even though that's just as likely.

DR. MULLEN: Thank you. Please don't turn off your mic yet. But maybe you'll want to answer this too.

If someone has had COVID-19, can they get the vaccine? And when should they get it?

DR. OFFIT: Yes. Well, programmatically, there's going to be no attempt to distinguish people who were previously infected or not. Number one.

Number two is these trials include people who were previously infected. So, we have the theoretical concern that I've been infected, will the vaccine in some way be -- cause me to have an altered or abhorrent response?

So, there are data on that. And it doesn't look like that's true. All you're going to do is get a boost in your immunity.

So, there's no reason to separate that. Programmatically it adds another layer to what already is going to be a complex program.

DR. MULLEN: Thank you. So, I was going to use moderator's privilege to ask this question. But now I don't have to call it mine, because somebody else has also posed it.

I was the medical director of a community health center. And the question is, community

health centers are trusted by the community, but are often overlooked by plans and allocation strategies.

How can community health centers be involved in vaccine allocation and help build trust?

MS. GREENE: So, I'm happy to jump in on this one. And I was a little slow on the last question, but can jump in there as well.

And say that as Dr. Offit said, I don't think there's any widespread way to apply any decision making related to immunity.

But for, you know, for instance that first -- that first round of healthcare workers, I have heard discussion of health systems prioritizing, because they need to prioritize people that have not gotten sick within the last three months for instance.

So, it is a way for, I think, on a much smaller scale, individual health systems to think about how to prioritize limited vaccine.

Moving to the community health center question, which I love, I think they are critical.

They will be critical particularly in those later,

those later phases.

You know, I think it's very -- there's a lot of variability in the extent to which they were specifically called out. Or -- and more practically maybe involved in some of those planning committees.

But, you know, I think through every state plan I've read, there's a lot of recognition about how community health centers are really going to be essential in terms of reaching out to these communities. In terms of having deep wells of trust and establish relationships.

And being able to communicate with the types of communities that we know are at high risk. And we also know that they serve populations that are extremely vulnerable when it comes to having the high risk conditions.

So, you know, I think I could name a couple of plans off the top of my head that I know really emphasize this. Massachusetts is one.

But, I think they are going to be a really strong and important partners. And I think states have really been focusing on sort of the initial

closed pod health system distribution initially.

But, they're going to become more and more important as this goes on.

DR. MULLEN: Thanks. And what the questioner reminds me, is that one of the ways to consider equitable planning, is to ask yourself after you think you're done, or when you think you're almost finished with your plan, is who are we leaving out?

Too just really keep scouring your mind and your communities about who else needs to be at the table. And sometimes the less so-called expert it seems maybe the closer you're getting to who the other experts are that could sometimes be omitted.

And that's one way to really ensure the kind of inclusion that's necessary to reach people in the way which we're talking about. And to leave as few people behind as possible.

And to help us learn how well we're doing so we can continue to improve going forward.

One of the things I really had hoped for today, that I want to share as I thank our excellent

experts for their time thoughtfulness, is how much I wanted anybody who walked away from this conversation to feel confident that there's more organized thought and action than they might believe.

And if it doesn't seem that way, then as a public health leader, what I'll say is, this is really what it looks like. Because after a certain point, the state flexibility that we're hearing about, actually is still informed by guidance that was created by not just people inside bureaucratic agencies, but by all of the partners who work with them from academia and communities and others anyway.

And, I mean, that's the broadest and sort of most beautiful, and I don't want to wax too much. But, essence of the way in which we need to achieve public health leadership and practice.

So, I appreciate hearing about the challenges, because I just understand them to be the complexities that people have been anticipating, planning for, working towards, and will continue to address as we learn every day.

And with that, what I hope is that those who do believe that there is organization and planning

and fairness baked into what people are thinking about and doing at the national level and at the state level, if they hear that, that they don't drop the ball.

Because the real work continues to get done as it goes all the way down into the hands of hospital administrators, and mayors, and business leaders, employers and others in their organizations.

And so we all have frameworks that we can follow that are embedded and informed by the excellent science, planning, understanding, of the logistics of it all. But rooted very much in the evidence and building new evidence along the way.

And so that if we hold all of that across the continuum in the same way that we think about the way in which the supply chain needs to work, if we can think about these principles going all the way through as well.

Maybe that will reassure all of us, and get us where we need to be as we also ask people to keep wearing their masks. Even as they have to say through their mask, I got my vaccination,

but I'm still wearing my mask.

And I'll still keep my distance and do all of the other things that we know are still important along the way.

I thank all of you for being with us today. I once again thank all of our presenters.

And then end with these reminders, that everyone who is registered for today's webinar will receive an invitation to our next webinar.

This one has been recorded. And the recording, a transcript, and slide presentations will be available on covid19conversations.org.

Once again, thank you to all of our panelists, to the American Public Health Association, and the National Academy of Medicine for sponsoring this webinar series.

This is the last webinar of 2020. I've heard some people say they're glad 2020 is ending.

But, I'm sure a lot of people will be glad to hear more webinars in 2021.

And thanks to our listeners for joining us today. Please stay safe and healthy, and happy holidays. Thank you.

(Whereupon, the above-entitled matter
went off the record at 6:29 p.m.)