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## Everything You Need to Know about COVID-19 Vaccines in the U.S.

In this report, we outline the latest statistics on vaccine availability, distribution, and administration at this snapshot in time. We share our views on the different vaccine candidates on the horizon and projections for vaccine availability. Additionally, we outline President Biden's strategies for carrying out his goal of 100M+ vaccines during his first 100 days in office, thoughts on his response, and big pharmacies' roles in bringing vaccines to the people. In general, the U.S. has been quick to coordinate the research and discovery of COVID vaccines, but has had challenges getting these vaccines into the arms of the public. Things appear to be improving as vaccinations are slowly ramping up.

Based on the information outlined in the slides, we have made five key observations:

- **"100 million doses in 100 days" seems more than attainable.** With 1.25 million doses per day administered over the past week alone, Biden's long-stated goal that initially seemed ambitious now seems well within our grasp.
- **We caution against forecasting herd immunity in the next few months.** For example, we still do not have vaccines approved for individuals under the age of 16, thus meaning nearly everyone over age 16 would have to agree to get the vaccine. Public polling of Americans shows that is unlikely.
- **New SARS-CoV-2 Variants persist and grow more concerning.** We are becoming more concerned about the long-term efficacy prospects for COVID-19 vaccines/candidates given new evidence of reduced NAb titer against newly emerging strains with several Spike protein mutations. New vaccine variants may need to be developed regularly in the long-term.
- **Vaccine production projections explained.** According to their estimates, mRNA and PFE alone will be able to deliver enough vaccine to immunize the entire U.S. population by October; by late-July if a single-shot JNJ vaccine is authorized in early 2Q21.
- **Second Wave vaccine candidates could substantially increase production.** JNJ, NVAX, and AZ will have 1H21 readouts, which could lead to authorization in the U.S. Our NAb-based analysis suggests that NVAX will be the only vaccine developer to potentially have a new >90% efficacy vaccine in the U.S. by 3Q21.

## VACCINE UPDATE SUMMARY

In this report, we outline the latest statistics on vaccine availability, distribution, and administration at this snapshot in time. We share our views on the different vaccine candidates on the horizon and projections for vaccine availability. Additionally, we outline President Biden’s strategies for carrying out his goal of 100M+ vaccines during his first 100 days in office, thoughts on his response, and big pharmacies’ roles in bringing vaccines to the people.

### Impact of new SARS-CoV-2 Variants

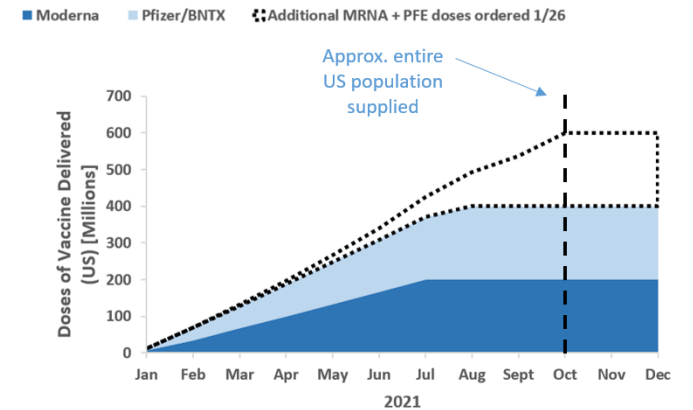
- ❖ Given it took only ~1yr for a variant to emerge that reduces NABs 6-fold, we may need new candidates in order to maintain high VE; potentially favoring RNA vaccines that have shorter development cycles.
- ❖ Could present negative readthrough for clinical-stage vaccine candidates w/ NAb titer levels lower than convalescent controls (i.e., AZ, Sinovac, ARCT, JNJ single-shot).

### Expectations for 2nd Wave Vaccines

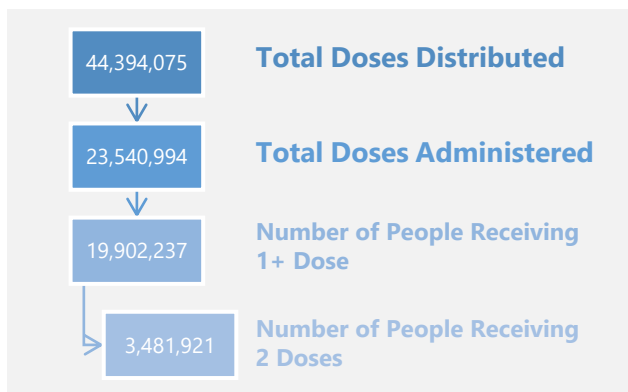
Using our regression analysis, we predicted efficacy for:

- **JNJ** (~60% for single shot, closer to 80% for prime-boost; data this month)
- **NVAX** (>90%, data 1Q21 Ex U.S. from South Africa and U.K. studies and 2Q21 from U.S. study)
- **ARCT** (~55%; data potentially late 2021/early 2022).

### Projections for Vaccines in 2021



### Latest Vaccine Statistics



### Challenges with Vaccines Thus Far

-  1 Communications
-  2 Restrictions
-  3 Inexperience

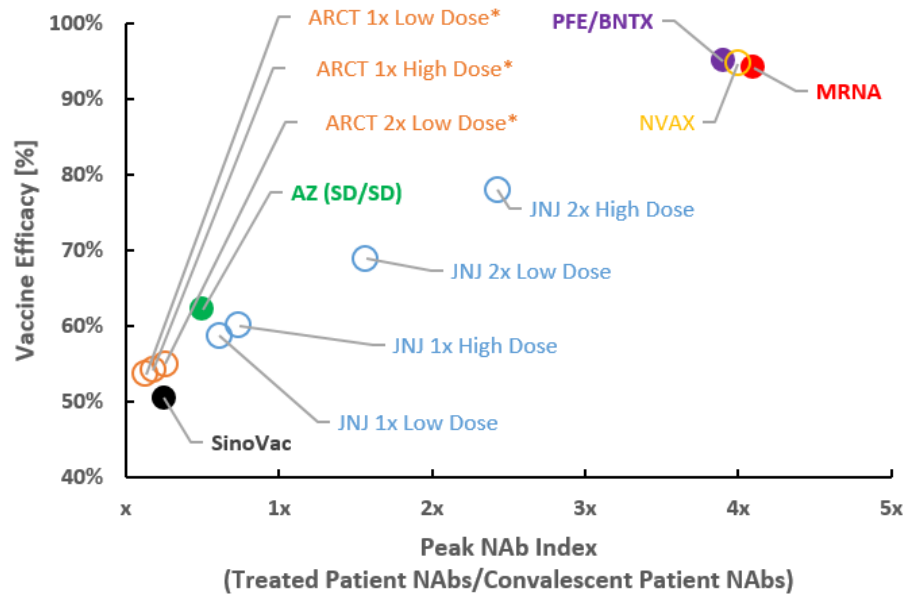
### Walgreens and CVS: Vaccine Assistance

- If supply were readily available, both WBA and CVS believe they have the capacity to administer **20-25M vaccines per month (40-50M/mo total)**.
- Walgreens and CVS Health are playing a key role in the distribution of vaccines to at-risk individuals in skilled nursing and other long-term care facilities and **have already administered 2.8M+ doses**.

### EXPECTATIONS FOR NEXT VACCINE WAVE

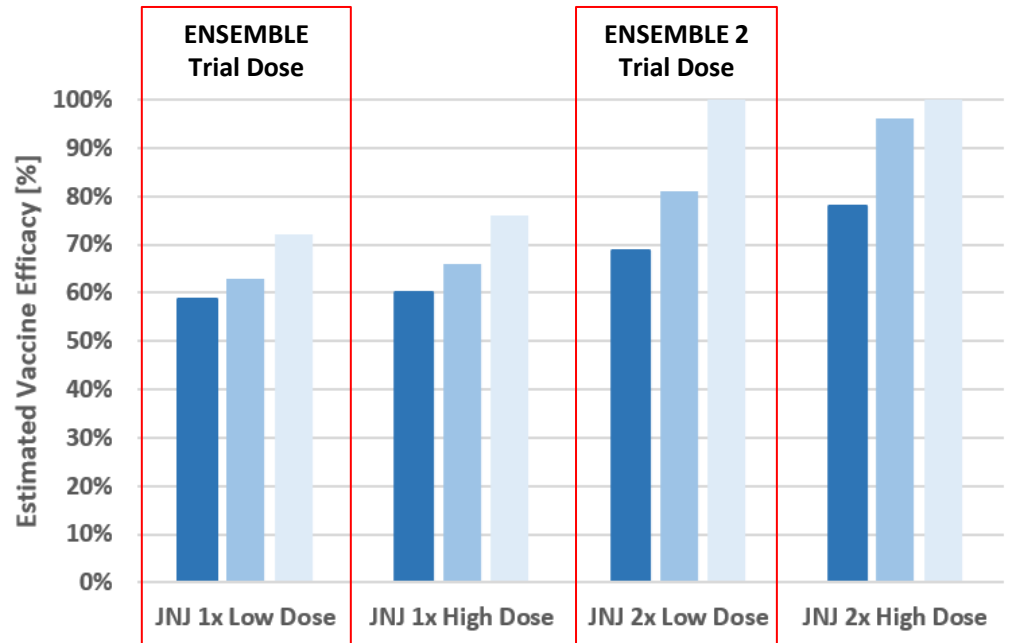
#### “Base case” vaccine efficacy (VE) estimates:

- ❖ Using a regression analysis based on our thesis that neutralizing antibody (NAb) response is the primary correlate of protection for COVID-19, we predicted VE for JNJ (~60% for single-shot, ~70-80% for prime-boost), NVAX (>90%), and ARCT (~55%).



Source: Various company presentations and publications, Raymond James research

Readout expected 1<sup>st</sup> week of Feb.



■ Base Case #1 (our original analysis) ■ Alternative base case ■ Extreme bull case

Source: Raymond James research

#### Alternate method for estimating “extreme bull case”:

- ❖ Disease severities for convalescent controls for each vaccine are different and we know NAb titer correlates with disease severity (implies greater VE for JNJ vs. our estimate given their convalescent controls for mostly severe patients).
- ❖ Tweaking our base case to generate “alternative base” and “extreme bull” cases that compensate for severe convalescent controls still predicts max efficacy for JNJ’s single-shot <80%.

## NEW SARS-COV-2 VARIANTS DRIVING CONCERN FOR LONG-TERM VACCINE EFFICACY

**Pfizer/BioNTech:** Sera from patients vaccinated with Comirnaty showed equivalent neutralizing antibody (NAb) titers in both a Wuhan reference strain and the B.1.1.7 (“UK”) SARS-CoV-2 variant. The B.1.351 (“SA”) variant was not evaluated.

**Moderna:** Moderna showed similar results for mRNA-1273 against the UK variant, however a 6x reduction in NAb titer was seen against the SA variant. MRNA now planning preclinical/clinical studies for vaccine candidate “mRNA-1273.351” to address high-mutation SARS-CoV-2 variants, as well as an mRNA-1273 boost study.

Variant Name	Approximate # of Spike mutations	Variant found in US?	Will mRNA-1273/Comirnaty provide protection?
"D614G" variants	2	Yes	Yes- High prevalence in Phase 3 studies
"Mink cluster 5" variant	5	Yes	Very likely- High NAb titers shown in preliminary studies for mRNA-1273
B.1.1.7 "UK" variant	9	Yes	Very likely- High NAb titers shown in preliminary studies for mRNA-1273 and Comirnaty
B.1.351 "SA" variant	10	No	Unclear- 6x reduction in NABs based on MRNA data; potentially reduced VE
P.1 "Brazil" or "Japan" variant	11	Yes	Unclear- no data
CAL.20C "California" variant	4	Yes	Unclear- no data

### Key Takeaways

- ❖ Given it took only ~1yr for a variant to emerge that is associated with a 6x NAb reduction, vaccine developers may need to generate new candidates in order to maintain high VE; potentially favoring RNA-based vaccines that have shorter development cycles.
- ❖ Could present negative readthrough for clinical-stage vaccine candidates with Phase 1/2 NAb titer levels near/lower than convalescent controls (i.e., AZ, Sinovac, ARCT, JNJ single-shot).

## THE NEXT WAVE OF COVID-19 VACCINE CANDIDATES

### Upcoming Phase 3 Readouts

- **JNJ/Janssen:** Phase 3 readout for single shot (ENSEMBLE trial) expected 1<sup>st</sup> week of February (according to CFO at 4Q20 eps). ENSEMBLE 2 trial (prime-boost dosing) to read out later in 2021. Ad26.COVS.S (viral vector-based) is reportedly stable for two years at -4F and three months in a standard refrigerator (35-46F).
- **AstraZeneca:** Authorized in the U.K., AZ is running a Phase 3 trial of AZD1222 (viral vector-based) in the U.S with data expected by end of 1Q21.
- **Novavax:** Data from Phase 3 (U.K.) and Phase 2b (S. Africa) studies of NVAX-CoV2373 (protein subunit-based) expected in 1Q21. US/Mexico-based Phase 3 data expected 2Q21
- **Curevac (no US-based trial):** The Europe and Latin America-based Phase 2/3 efficacy trial for CVnCoV (RNA-based) initiated 12/14/2020 with primary completion expected June 2021.

### Other Operation Warp Speed Vaccine Candidates

- **Merck:** Ended COVID-19 vaccine programs (1/25/2021) for 2 (potentially single-shot) replicating viral vector candidates due to inferior lack of humoral (NAb) immune response.
- **Sanofi/GSK:** Development delay for two adjuvanted recombinant protein-based vaccine candidates announced based on insufficient response in older adult populations. “Product availability now expected in Q4 2021.” Agreed to produce >100M doses of Comirnaty (PFE/BNTX) by YE2021.

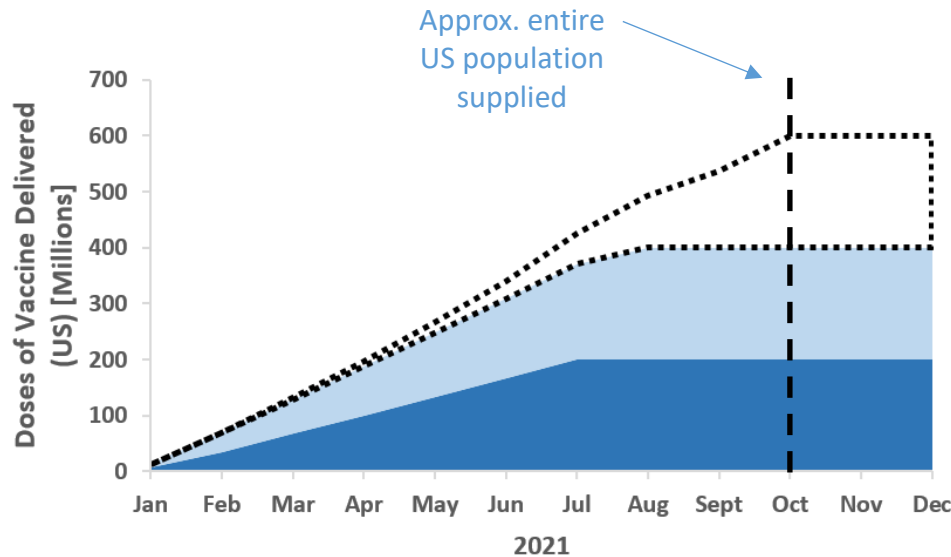
### Earlier-Stage Clinical

- **Inovio:** INO expects to complete a Phase 2 study of INO-4800 (DNA plasmid-based, includes electronic administration device) in 1Q21 and to initiate Phase 3 in 2Q21.
- **Arcturus:** Approved to begin Phase 2 studies on ARCT-021 (RNA-based) in Singapore and the U.S. (FDA) with expected data readouts in early 2021. Global Phase 3 trial targeting initiation in 2Q21 which could allow application for EUA as early as 2H21.
- **Vaxart:** Topline data for oral, room temperature stable VXA-COV2-1 (viral vector-based) is expected the first week of Feb. 2021. VXT plans to initiate a Phase 2 study in 1Q21.

## VACCINE PRODUCTION PROJECTIONS

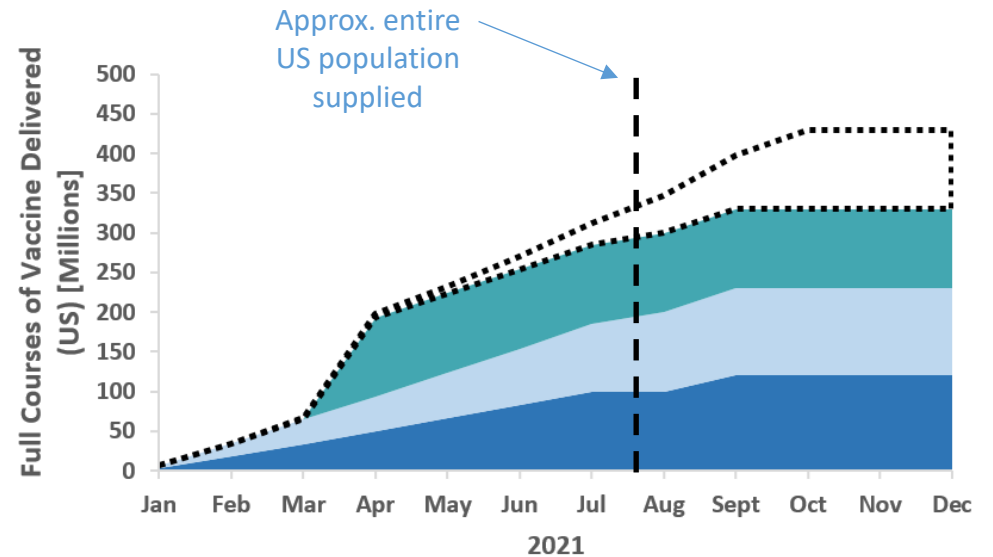
**Case #1: PFE/BNTX and MRNA EUAs only**

■ Moderna ■ Pfizer/BNTX ■ Additional MRNA + PFE doses ordered 1/26



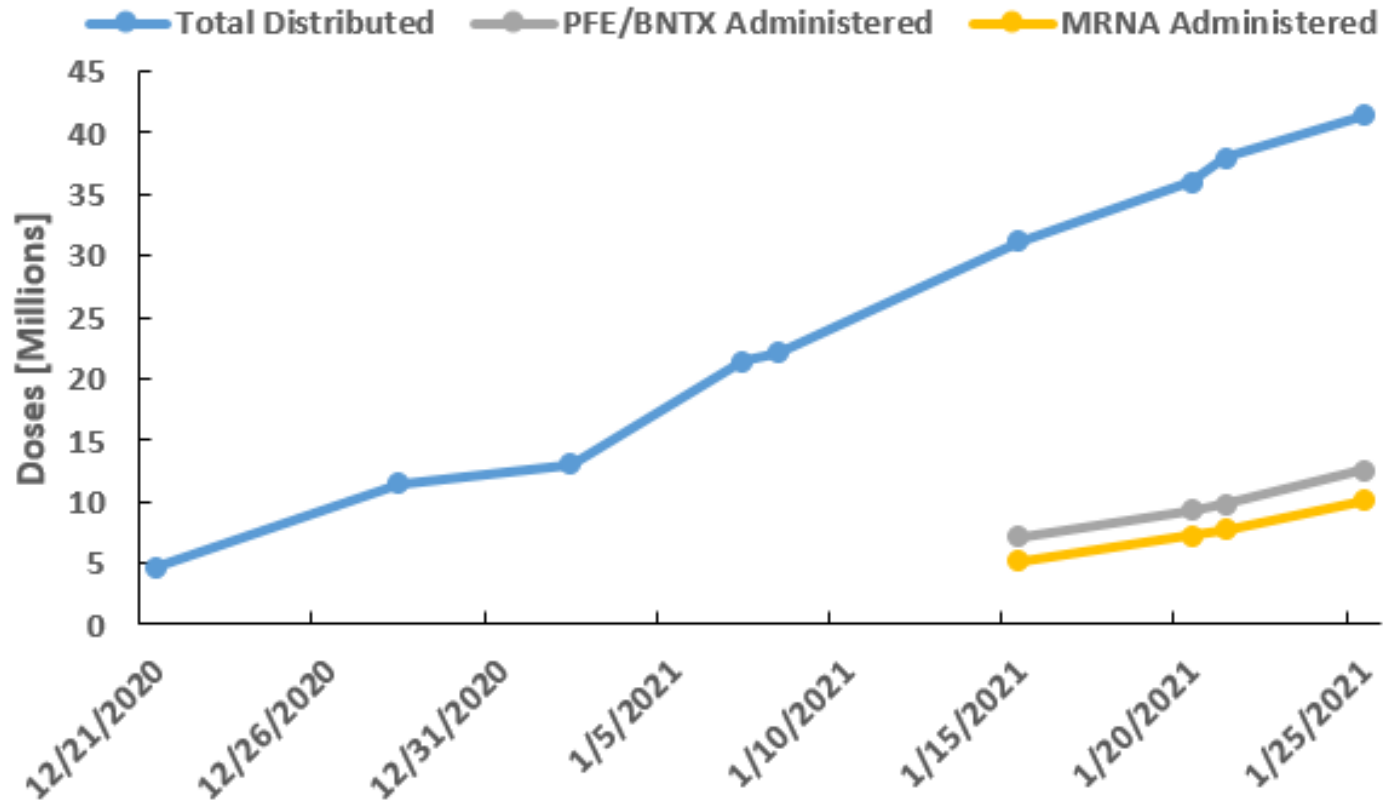
**Case #2: PFE/BNT, MRNA, and JNJ (single-dose) EUAs**

■ Moderna ■ Pfizer/BNTX ■ JNJ ■ Additional MRNA + PFE doses ordered 1/26



- 12/11/2020** OWS increases supply contract to 200M doses of mRNA-1273 (**MRNA**). OWS has option to acquire an additional 300M doses.
- 12/23/2020** **PFE** announces additional 100M dose order from US government. Indicates they expect to deliver 170M doses by June 30 and 200M doses by July 31, 2021. The U.S. has option to acquire up to an additional 400M doses.
- 12/23/2020** **HHS Secretary Alex Azar** (re: PFE supply contract): “This new federal purchase can give Americans even more confidence that we will have enough supply to vaccinate every American who wants it by June 2021.”
- 1/21/2021** **JNJ** board member McClellan: “I do know that J&J is making a very large supply, going all out with its production, both here in the U.S. and elsewhere around the world, with the goal of having perhaps enough vaccines for 100M Americans by spring, by this April or so.”
- 1/26/2021** **MRNA** provides update on U.S. distribution: they have already sent 30.4M doses to the U.S., and are on track to deliver 100M doses by end of March and 200M doses by end of June 2021. Just over 30M doses/month production would get MRNA to their US targets.
- 1/26/2021** **Sanofi** announces plans to produce 100M doses of **PFE’s** Comirnaty in their European facility in 2021. We estimate <10M/month boost to PFE’s global vaccine production (and even less to PFE’s estimated ~35M dose/month U.S. production) beginning in ~March.
- 1/26/2021** President Biden announces plan to purchase additional 100M doses of vaccine each from **MRNA** and **PFE/BNTX** to be delivered by end of Summer. *This plan is included in our models as a dashed line.*

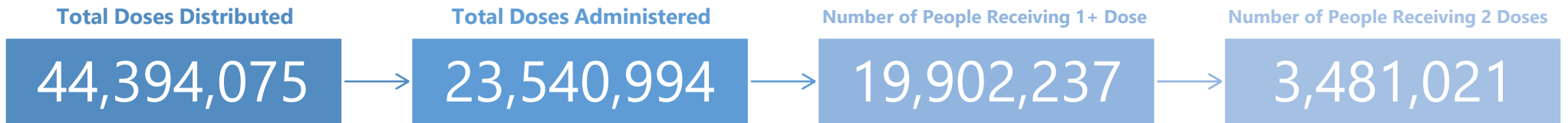
## CURRENT U.S. DELIVERY/DOSING SNAPSHOT TO DATE



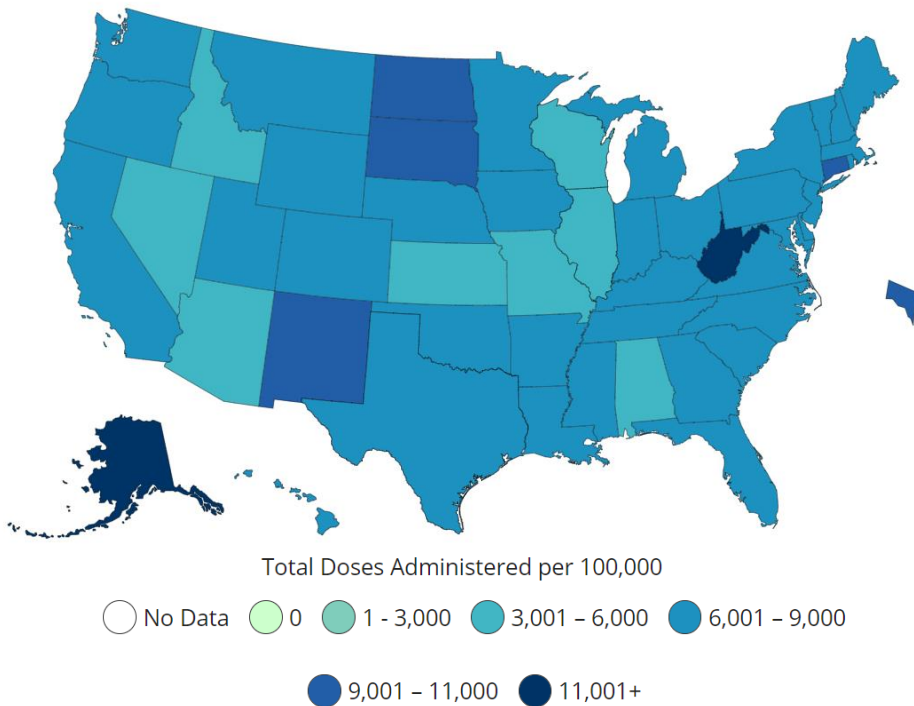
- ❖ The snapshot of deliveries to date, combined with company guidance on vaccine manufacturing amount and timing going forward were used as inputs to inform our model on the prior page.
- ❖ Distribution of total vaccine doses in the U.S. is following a roughly linear ramp-up at this stage.
- ❖ Pfizer and Moderna will need to maintain production of >30M doses/month beginning in Feb. to meet their targets.
- ❖ The ratio of administered-to-distributed doses surpassed 50% (55%) for the first time this week, indicating that vaccine is being more efficiently administered to patients after delivery.

## STATE OF VACCINATIONS

### Vaccinations in the U.S.: Summary Breakdown



Total Doses Administered Reported to the CDC by State/Territory and for Selected Federal Entities per 100,000



Average Daily Number of Doses Administered Over the Past Week:

1.25 Million

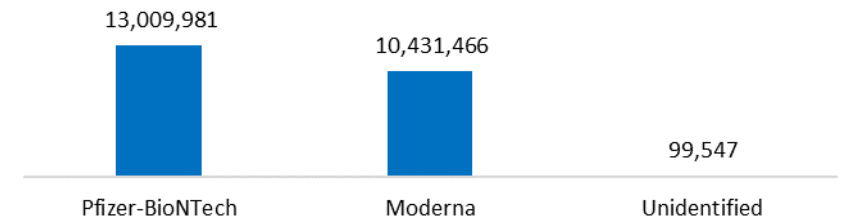
#### Distribution Update

The Biden Administration is upping the weekly distribution rate to **10 million vaccines per week** on average, up from 8.6 million vaccines on average.

#### Our View

Although Operation Warp Speed (OWS) was successful in supporting research, development, and distribution of COVID vaccines in record time, the "last mile" appears to be the slowest. States have had a slow start getting shots distributed into people's arms. Although the strategic hierarchy for vaccine recipients varies slightly by state, it has expanded over the past couple of weeks to include primarily healthcare workers, long-term care facility residents, people over age 65, and individuals with pre-existing conditions.

#### Administered Doses by Company

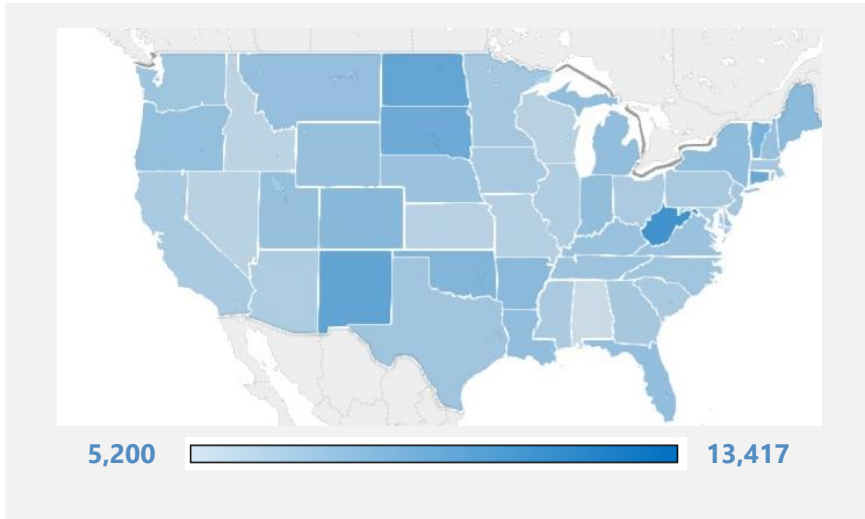


Sources: Raymond James Research, Bloomberg, and CDC

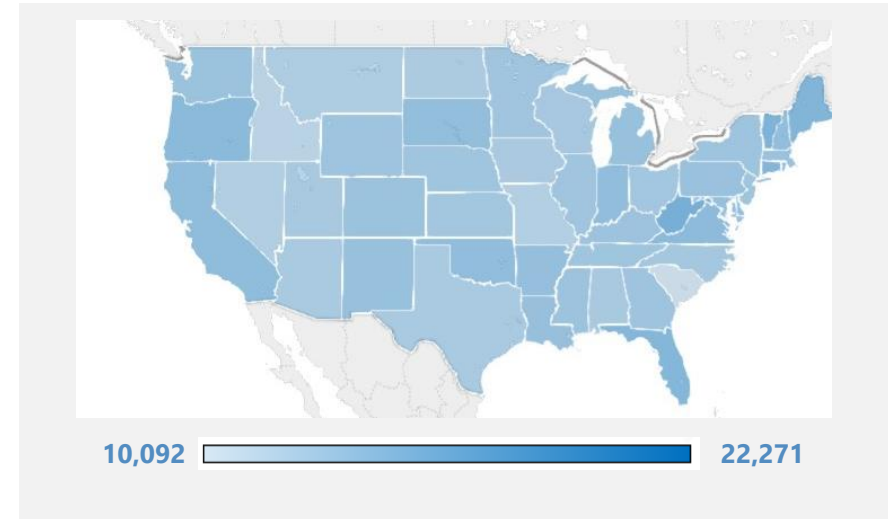


## STATE OF VACCINATIONS

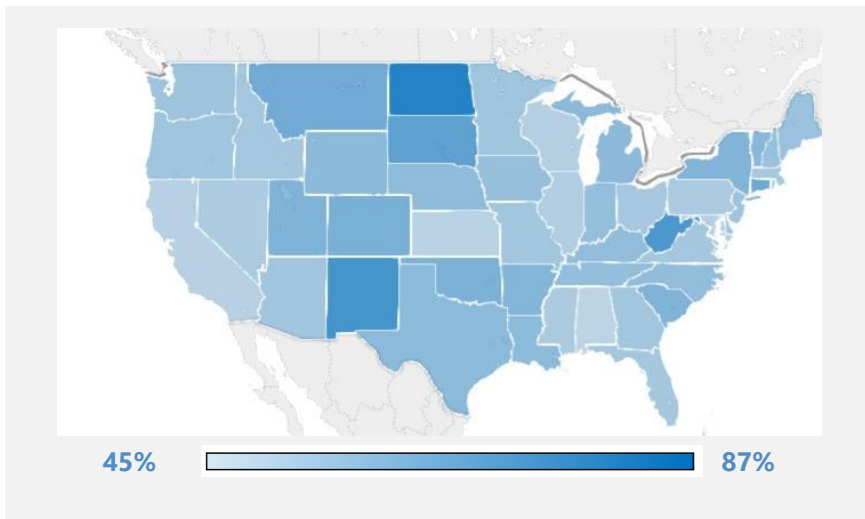
**Distributed per 100k**



**Administered per 100k**



**Total Administered/Total Distributed**



**States with Highest Administered/Distributed Rates**

North Dakota: 87.0%  
 New Mexico: 77.6%  
 West Virginia: 75.6%

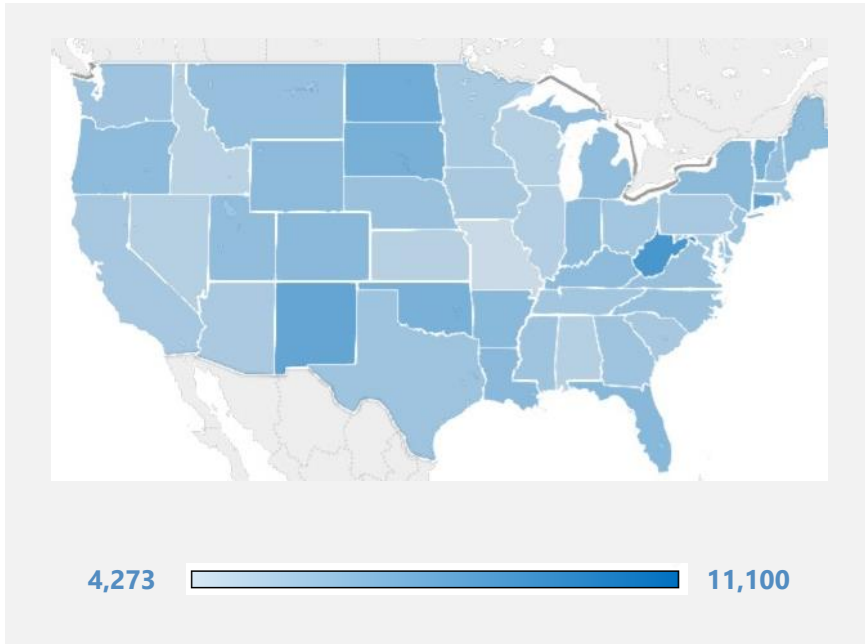
**States with Lowest Administered/Distributed Rates**

Hawaii: 44.6%  
 Alabama: 44.8%  
 Kansas: 45.6%

Sources: Raymond James Research and [CDC](#)

## STATE OF VACCINATIONS

Number of People with First Dose per 100k



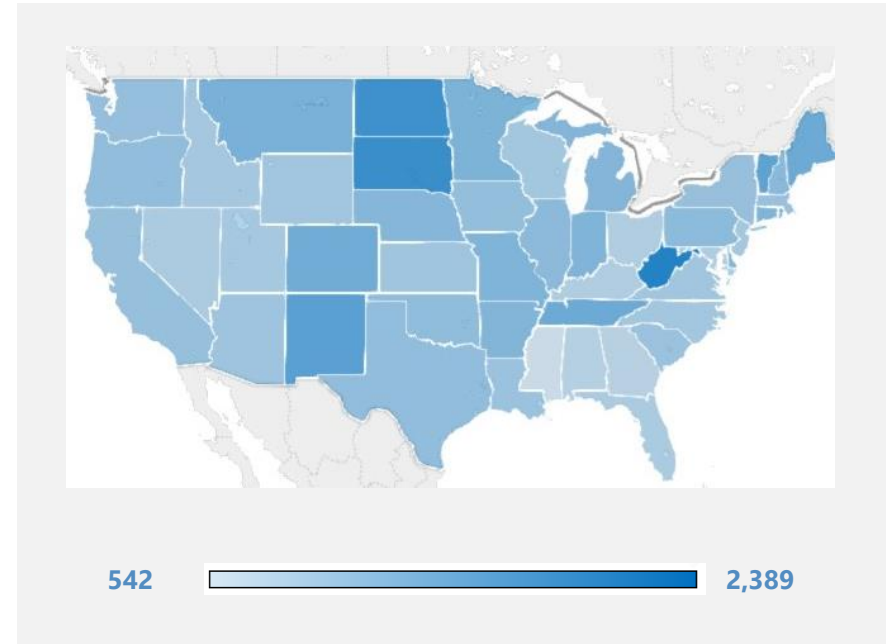
States Leading in People with First Dose per 100k

Alaska: 11,100  
 West Virginia: 9,355  
 New Mexico: 8,183

States Lagging in People with First Dose per 100k

Missouri: 4,273  
 Idaho: 4,392  
 Kansas: 4,536

Number of People with Second Dose per 100k



States Leading in People with Both Doses per 100k

West Virginia: 2,389  
 Alaska: 2,299  
 South Dakota: 2,120

States Lagging in People with Both Doses per 100k

Mississippi: 542  
 Georgia: 612  
 Alabama: 631

Sources: Raymond James Research and [CDC](#)

## CHALLENGES WITH VACCINES SO FAR

Despite speed of development and emergency use authorizations for two vaccines, the "last mile" (a term used for getting a vaccine delivery in a state into the arms of those needing it) progressed far slower initially than required for the nation to turn the corner, with millions of doses still sitting on the shelves. **There are numerous factors that have contributed to the slow ramp up in actual vaccinations, but we will focus on three areas:**

**① communications, ② restrictions, and ③ inexperience.**



### ① Communications

There was clearly a failure of communication between the federal, state, and local governments regarding when vaccines would arrive, how many vaccines would be allocated in the coming weeks, and concerning how to execute the vaccination campaign. These failures in communications led some state and local governments to stockpile supplies to ensure they had enough for the second doses, therefore, they limited how many people could get the first dose. There were also issues with the communications between Walgreens and CVS, who were nationally contracted to vaccinate nursing homes, and long-term care facilities, and therefore certain paperwork was done for residents thus delaying vaccinations.



### ② Restrictions

State and local governments became very prescriptive over who could and could not get the vaccinations and threatened major penalties for anyone who gave a vaccination to someone not in the priority group. This resulted in additional bureaucracy thus taking time away from vaccinations. It also resulted in vaccine going to waste as they couldn't find individuals at the end of the day to use it that fit in the categories. If they had been less restrictive, more vaccines would have been used more quickly.



### ③ Inexperience

Instead of relying on entities accustomed to giving vaccinations in large quantities at their locations like pharmacies and physician offices (8.5m per week during seasonal influenza), the initial goal used hospitals and public health departments. This required new systems to be created by people without much experience in this area.

Source: Raymond James Research

## KNOWN UNKNOWNNS

*While we see a pretty straightforward roadmap for how things should unfold in the months ahead, there are certain things we know we do not know, such as...*



- The portion of the population that will choose not to get vaccinated
- Whether the virus will mutate to the point of making vaccines ineffective



- The duration of immunity to the vaccine – will the vaccine protect for six months, a year, two years?



- The possibility of production delays to occur and lead to fewer vaccines available than expected



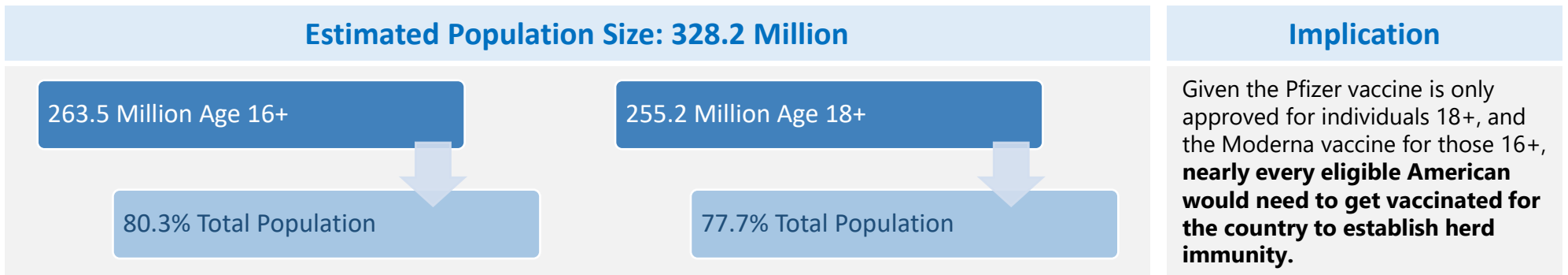
- The impact of potential lawsuits about how businesses handle care of their employees and businesses' willingness to return to normal

*While there are many things that could delay the return to normal, we think these are relatively low probability events.*

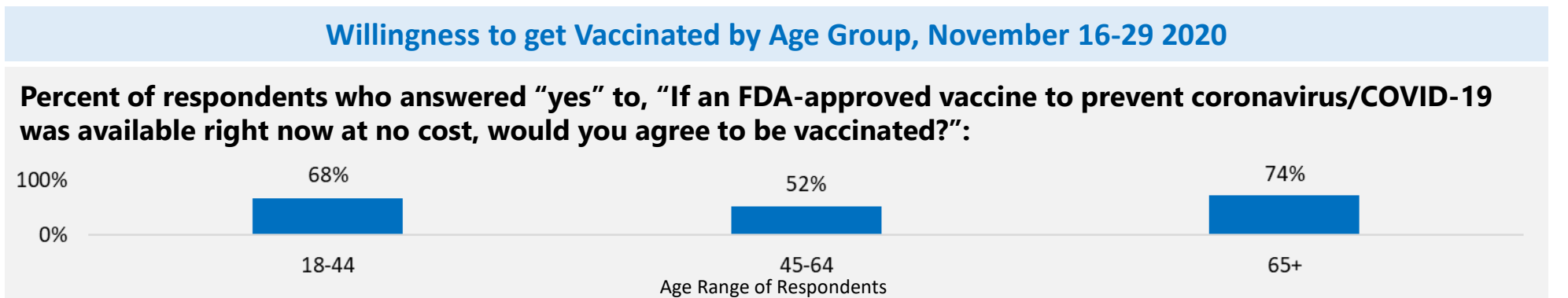
Source: Raymond James Research

## DEMOGRAPHIC CHALLENGES TO HERD IMMUNITY

- Vaccines have brought hope that the U.S. (and more broadly the world) could reach “herd immunity” to effectively eliminate the spread of the virus. However, given the demographic breakdown of our country and age restrictions on vaccines thus far, this may be more difficult to achieve than many anticipate.
- Experts predict that **70-80%** (~230M – 263M) of the American population would need to be immune to the virus in order to reach herd immunity. Dr. Anthony Fauci has estimated we may need as many as **90%** immune to reach herd immunity.



- Skepticism about the vaccine and reluctance to get vaccinated poses an additional challenge to herd immunity. A large portion of Americans have expressed unwillingness to get receive the vaccine even once offered.



Sources: Raymond James Research, 2019 U.S. Census, [Gallup Polling](#)

## OUR PROJECTION: COVID-19 IN 2021

Reopenings and a return largely to normal likely to occur PRIOR to reaching herd immunity.

2Q21

### Vaccines Ramp Up and Restrictions Slow Down

- Likely ramp-up of vaccinations and consequent loosening of restrictions
- More individuals returning to normal activities
- Vaccines likely available to all willing adult Americans by Memorial Day (May 31)
- More vaccinations should lead to notably less cases, hospitalizations, and fatalities
- Increasing numbers of Americans returning to pre-COVID activities, such as travel
- Businesses unlikely to require employees to return to the office

### Heightened Messaging as Vaccinations Continue

- Similar to today, but likely with looser restrictions as vaccinations continue
- Ramped-up messaging from the Biden Administration
- Biden likely to urge mask-wearing for 100 days
- Emphasis on safety and efficacy of vaccines
- Continued variability and political polarization of restrictions by state
- By the end of 1Q21, over 125 million Americans should have had access to vaccines

1Q21

### Returning to Largely Normal and Releasing Pent-Up Demand for Social Interaction

- Likely to lead largely to a return to normal
- Every adult American who wants a vaccine should have received both doses
- Mask-wearing mandates, restricted crowd sizes, and other restrictions likely alleviated
- Pent-up demand for social interaction released
- COVID likely to be largely in the rearview mirror for most Americans and businesses
- Proof of vaccinations could become a prerequisite for business-related meetings in-person and conference attendance

2H21

Source: Raymond James Research

## HEIGHTENED MESSAGING AS VACCINATIONS CONTINUE

1Q21

### 1Q21 should look similar to what we see today, but loosening of restrictions is likely.

- The incoming Biden Administration is likely to ramp up public health messaging.
- As we expected, Biden has asked every American to wear a mask for 100 days. This sets up an artificial deadline in the mind of Americans that all restrictions should be able to be lifted by early May. The strategy behind the 100-day request is that by that time a large portion of the population should have access to vaccines.
- The messaging will also focus heavily on reassuring the public that the vaccines are safe and effective. We expect in the 1Q21, states to continue to make their own decisions on how to proceed with restrictions and reopenings.
- While there may be requests from the Biden Administration for the nation to impose greater restrictions depending on just how bad things have gotten after the holidays, Republican governors can largely ignore what the federal government is requesting. We expect most Republican governors to do just that. Democratic governors are likely to align themselves with what the Biden Administration requests. One benefit of this is that the Democratic governors are more likely to trust what the Biden Administration requests and could be more likely to reopen sooner than they would be under a Trump Administration.
- By the end of the 1Q21, vaccines should be available for more than 125 million Americans. This can cover the most at-risk populations and therefore lead to dramatically lower hospitalizations and fatalities. Concern over hospitals being overwhelmed has led to most restrictions by local and state leaders. Releasing some of the pressure from hospitals will likely help lead to more individuals being willing to return to normal activities.

Source: Raymond James Research

## VACCINES RAMP UP AND RESTRICTIONS SLOW DOWN

2Q21

**The 2Q21 will likely continue what we are seeing at the end of the 1Q with a ramp up of vaccinations leading to loosening of restrictions at the state and local level and more individuals returning to normal activities.**

- By Memorial Day, we anticipate a vaccines being available for every American adult who is willing to get one.
- While reaching herd immunity likely will require at least 70% of the population to receive the vaccine (or have been infected), we believe life can return to normal prior to reaching that point.
- As more people get vaccinated, cases, hospitalizations, and fatalities should drop precipitously.
- The decrease will take COVID-19 off the front page and we anticipate will lead to increasing numbers of Americans returning to pre-COVID activities.
- In fact, we would anticipate a significant increase in vacation travel by the end of 2Q21 .
- However, we think businesses will be reluctant to have their employees return to the office too quickly.
- In 2Q, we expect an increasing number of businesses to let employees return in greater numbers, although, in our view, it is unlikely a majority will require return to office.

*Source: Raymond James Research*



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## RETURNING TO LARGELY NORMAL AND RELEASING PENT-UP DEMAND FOR SOCIAL INTERACTION

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2H21



**The second half of 2021 is likely to lead largely to a return to normal.**

- Every American adult who wants a vaccine should have received both doses by this point.
- We expect most American adults will no longer feel the need to wear masks and governments will not be mandating them.
- While some restrictions on crowd sizes could remain, the vast majority will likely be removed.
- We also anticipate a large pent-up demand for interacting with others to be released.
- We would expect COVID to largely be in the rearview mirror for most Americans and businesses.
- Proof of vaccinations could become a prerequisite for business-related meetings in-person and conference attendance.

*Source: Raymond James Research*

## BIDEN'S VACCINE AGENDA

### 1. Get more people vaccinated

- Encourage states to allow more people to be vaccinated including individuals 65 and older as well as frontline workers.
- Ensure equity throughout the vaccination process to reach those in hard-to-reach, marginalized communities.

### 2. Create more vaccination sites

- Stand up new, federally-supported community vaccination centers across the country.
- Fully reimburse state deployment of the National Guard to support vaccinations and provide additional FEMA assistance.
- Launch mobile vaccination clinics and provider partnerships to reach underserved urban areas and rural communities.
- Make vaccines available in pharmacies.
- Launch a new partnership with Federally Qualified Health Centers nationwide.
- Launch new models to serve high-risk individuals.

### 3. Increase supply and get it out the door as quickly as possible

- Ensure a robust vaccine supply and spur manufacturing.
- Be a reliable partner for states by providing actionable data on vaccine allocation timelines and delivery.
- Increase vaccine availability while maintaining a commitment to the two-dose schedule.

### 4. Mobilize more personnel to get shots in arms.

- Surge the public health workforce to support the vaccination effort.
- Mobilize a public health jobs program to support COVID-19 response.

### 5. Ensure the American people have the information and confidence they need to get vaccinated

- Launch a federally led, locally focused public education campaign.

**[See Our Note:](#)** Biden's proposed "American Rescue Plan" includes \$20B to carry out his vaccine goals.

Source: Raymond James Research, BuildBackBetter.gov

**BIDEN’S VACCINE AGENDA – MEEKINS’ RESPONSE**

[See Our Note: Open Letter to Pres-Elect Biden and His Team](#)

**Our Response to Biden’s Plan**

*Key Quotes Overall*

*The goal should be to build on what is working, fix what is broken, but the last thing we need is for the good that is happening to slow down while these adjustments are being made.*

*The federal, state, and local public health staff have already run a marathon and now you are asking them to turn it into an ironman.*

<b>On Communications...</b>	<b>On Vaccinations...</b>	<b>On Testing...</b>	<b>On Funding...</b>
<ul style="list-style-type: none"> <li>I suggest you partner with celebrities who are national treasures and viewed as apolitical like Betty White (Happy belated 98th birthday Betty), Dolly Parton (she did help fund the thing), and Mr. T (Laurence Tureaud) "I pity the fool who doesn't get vaccinated" to get them vaccinated.</li> </ul>	<ul style="list-style-type: none"> <li>We know that every year pharmacies and primary care physician offices are able to vaccinate more than 8.5 million Americans per week for seasonal influenza without breaking a sweat.</li> <li>Partnering with chain and independent pharmacies is likely the easiest and most important thing you can do to end this pandemic and I urge it to be priority number 1 on the vaccination front.</li> <li>When speaking to leadership in public health departments across the nation, it is clear they do not want this responsibility. Let’s focus on things we know that work rather than trying to reinvent the wheel.</li> </ul>	<ul style="list-style-type: none"> <li>Increasing testing will be an important tool to combat the pandemic, but is probably a lower priority than vaccinations and getting more therapeutics developed as a result of the limitations described above.</li> <li>The plan to increase genetic sequencing of the virus is long overdue.</li> </ul>	<ul style="list-style-type: none"> <li>Hiring 100,000 public health officials sounds like a laudable goal, but it seems like more of a headline grabbing announcement than something that will actually move the needle in the near term. In fact, it may set the effort in the near-term back.</li> </ul>

Source: Raymond James Research, BuildBackBetter.gov

## WALGREENS AND CVS: ROLE IN VACCINE DISTRIBUTION



- If supply were readily available, both Walgreens (WBA) and CVS believe they have the capacity to administer **20-25M vaccines per month (40-50M/mo total)**.



- Walgreens and CVS Health are playing a key role in the distribution of vaccines to at risk individuals in skilled nursing and other long-term care facilities and have **already administered 2.8M+ doses**.

### Skilled Nursing Facilities

Together, CVS and WBA have been selected to administer vaccines to 13k+ skilled nursing facilities across the U.S. As of 1/25 both companies had administered the first dose at almost 100% of these clinics and have begun working on the distribution of the second dose.

### Assisted Living Facilities

~60k assisted living and other long-term care facilities have partnered with WBA and CVS for vaccine distribution. Combined both companies have administered the first dose to just under 50% of these facilities. Another 14k facilities are scheduled to begin their vaccinations within the next week, which would bring the total to ~70% of total facilities that the two are responsible for.

Both companies release daily updates on facilities and vaccines administered: CVS ([here](#)) and WBA ([here](#)).

## Recent Commentary from Management at Conferences

### WBA:

- “Expect the U.S. will administer ~300M doses in 2021.”
- “Expect to have 50k people trained in vaccination by February, so when vaccines become available to the masses – which we believe will be in March or April – we will be ready”

### CVS:

- “We will have 90k+ employees that can administer doses.”
- “When we get to the retail stage, when the vaccine is readily available, we’ll do almost 1M vaccines a day”

## OUR CONCLUSIONS

*In general, The U.S. has been quick to coordinate the research and discovery of COVID vaccines, but has had challenges getting these vaccines into the arms of the public. Things appear to be improving as vaccinations are slowly ramping up in number.*

### **“100 million doses in 100 days” seems more than attainable.**

With 1.25 million doses per day administered over the past week alone, Biden’s long-stated goal that initially seemed ambitious now seems well within our grasp.

### **We caution against forecasting herd immunity in the next few months.**

Although our country’s vaccine effort is making noteworthy progress, challenges persist that could keep 70-80% of the population from obtaining immunity in the near future. For example, we still do not have vaccines approved for individuals under the age of 16, thus meaning nearly everyone over age 16 would have to agree to get the vaccine. Public polling of Americans show that is unlikely.

### **New SARS-CoV-2 variants persist.**

We are becoming more concerned about the long-term efficacy prospects for COVID-19 vaccines/candidates given new evidence of reduced NAb titer against newly emerging strains with several Spike protein mutations. New vaccine variants may need to be developed regularly in the long-term.

### **Vaccine production projections explained.**

According to their estimates, mRNA and PFE alone will be able to deliver enough vaccine to immunize the entire U.S. population by October; by late-July if a single-shot JNJ vaccine is authorized in early 2Q21.

### **2<sup>nd</sup> Wave vaccine candidates could substantially increase production.**

JNJ, NVAX, and AZ will have 1H21 readouts, which could lead to authorization in the U.S. as well as substantially increased vaccine production. Our NAb-based analysis suggests that NVAX will be the only vaccine developer to potentially have a new >90% efficacy vaccine in the U.S. by 3Q21.

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