Preparing for a COVID-19 vaccine
Insights from CVS Health

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Chief Medical Officer,
CVS Caremark

CVS Health.
## COVID-19 vaccine
An unprecedented global response

### Number of candidates in trials

<table>
<thead>
<tr>
<th>Disease</th>
<th>Candidates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ebola</td>
<td>55</td>
</tr>
<tr>
<td>Dengue</td>
<td>56</td>
</tr>
<tr>
<td>Polio</td>
<td>95</td>
</tr>
<tr>
<td>Tuberculosis</td>
<td>108</td>
</tr>
<tr>
<td>Malaria</td>
<td>126</td>
</tr>
<tr>
<td>COVID-19</td>
<td>213</td>
</tr>
</tbody>
</table>

Multiple vaccines will be available, each with different efficacy and safety profiles and eligible populations.

Ensuring the right patients get the right vaccine at the right time will be critical as more candidates enter the market.

Source: Chart: Copyright © 2020 by Boston Consulting Group. All rights reserved. Updated 25 August 2020. COVID-19 number – October 22, 2020. [https://covid-19tracker.milkeninstitute.org/](https://covid-19tracker.milkeninstitute.org/). The source for data in this presentation is CVS Health Enterprise Analytics unless otherwise noted. Please see the disclaimer page at the end of this presentation for more information.
The goal of the COVID-19 vaccine

To train the immune system to identify coronavirus and create an army of memory cells that provide immunity.

There are several vaccine technologies in play.

SARS-CoV-2 structure:
- Membrane protein
- Spike glycoprotein
- Nucleocapsid
- Envelope
- RNA
- Hemagglutinin esterase-dimer

S protein
Highly stable
Prime target for creating vaccine
Traditional approaches

**Whole virus**
Inactivated form of the whole virus

10+ candidates in trials

Prior vaccines: Dengue, Polio, TB, etc.

**Protein sub-unit**
Immune-stimulating component of the virus

90+ candidates in trials

Prior vaccines: Hepatitis B, etc.

Operation Warp Speed manufacturers:

Source: https://www.nature.com/articles/d41586-020-01221-y
Novel technologies

**Viral vector**
- Replicating and non-replicating approaches
- 40+ candidates in trials
- Prior vaccines: Ebola

**Operation Warp Speed manufacturers:**
- AstraZeneca
- Johnson & Johnson
- Merck
- Vaxart

**Nucleic acid**
- Either DNA or RNA – derived from the virus into cells
- 40+ candidates in trials
- Prior vaccines: None

**Operation Warp Speed manufacturers:**
- Biontech/Pfizer
- Inovio
- Moderna
- Vaxart

Source: https://www.nature.com/articles/d41586-020-01221-y
The road to vaccine approval
Fast tracking the development of a COVID-19 vaccine

**Head start**
Initial step of exploratory vaccine design shortened due to data from SARS-CoV-1 and MERS CoV vaccine development

**Government investment**
Emergency authorities invoked to enable manufacturing to start alongside clinical trials

**Pandemic recruitment**
Ability to show efficacy quicker due to higher rate of infections, more participants

**Cutting-edge approaches**
New manufacturing technologies accelerating vaccine production
The FDA provided guidance for emergency use authorization

**Efficacy**
- At least 50% more effective than placebo
- 30K+ participants in trials

**Safety**
- Median follow-up duration of at least 2 months
- 3K vaccine recipients followed for adverse events
- Phase 1 and 2 safety data required

**Manufacturing**
- Sufficient data to ensure the quality and consistency of the vaccine

Source: https://www.fda.gov/media/142749/download
Nine leading vaccine candidates with Pfizer granted and Moderna pending for emergency use authorization

Not comprehensive. Preliminary – Not meant to communicate clinical, legal, or regulatory advice.
Sources: BioCentury, ClinicalTrials.gov, Milken Institute COVID-19 Treatment and Vaccine Tracker. 
Select evaluation criteria for COVID-19 vaccines

- Efficacy
- Safety
- Age of vaccine recipient
- Route of administration
- Distribution/Storage requirements
- Dosing frequency
## Distribution and administration requirements

<table>
<thead>
<tr>
<th>Logistics of cold chain shipping</th>
<th>Avoiding waste with multi-dose vials</th>
<th>Dosing, scheduling and tracking</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network of dry ice, ultra cold freezers and optimized logistics required</td>
<td>Capable of holding 5 to 15 doses</td>
<td>Booster shot required 21 to 28 days after first vaccination*</td>
</tr>
<tr>
<td></td>
<td>Given cold chain considerations, the operational workflow must minimize waste</td>
<td>Tracking to ensure each patient gets required dosing in appropriate time frame</td>
</tr>
</tbody>
</table>

*Timeframe for different vaccines may vary*
Potential prioritization of critical populations across phases

Phase 1* (~261M+)

Phase 1a
Health care personnel: ~21M
Long-term care facility residents and workers: ~3M

Phase 1b
Essential workers (non-healthcare): ~87M

Phase 1c
Adults with high-risk medical conditions: >100M
Adults ≥ 65 years**: ~50M

Additional prioritization to be determined in later phases

Staff and residents of other congregate living facilities
People of all ages with conditions that put them at moderately higher risk
Prisoners, detainees and staff
Young adults
Children
Everyone residing in the United States who did not have access to the vaccine in previous phases

*CDC ACIP Dec 2020 Meeting Presentation
**Excluding older adults in LTCFs
CVS Health initiated a broad, nationwide survey* to understand which populations are more or less willing to receive a COVID-19 vaccine, and why they have those particular sentiments.

Survey conducted November 10-15, 2020
5K+ participants
Survey findings showed significant hesitancy across multiple populations

28% were interested in a vaccine as soon as it is available

35% would wait until others had been vaccinated

20% were uncertain about receiving a vaccination

17% did not plan on being vaccinated
Culturally competent education will be key to addressing vaccine hesitancy

<table>
<thead>
<tr>
<th></th>
<th>White</th>
<th>Black</th>
<th>Native American</th>
<th>Asian</th>
<th>Hispanic, English as primary language</th>
<th>Hispanic, Spanish as primary language</th>
</tr>
</thead>
<tbody>
<tr>
<td>I plan on receiving the new COVID-19 vaccine and I would like to get it soon after it becomes available to the public</td>
<td>31%</td>
<td>16%</td>
<td>22%</td>
<td>21%</td>
<td>28%</td>
<td>36%</td>
</tr>
<tr>
<td>I plan on receiving the new COVID-19 vaccine but I would like to wait until after a decent number of people have already gotten it</td>
<td>35%</td>
<td>29%</td>
<td>30%</td>
<td>51%</td>
<td>34%</td>
<td>42%</td>
</tr>
<tr>
<td>I am uncertain whether or not I would receive the new COVID-19 vaccine</td>
<td>18%</td>
<td>29%</td>
<td>25%</td>
<td>21%</td>
<td>22%</td>
<td>16%</td>
</tr>
<tr>
<td>I do not plan to receive the vaccine for COVID-19</td>
<td>16%</td>
<td>26%</td>
<td>23%</td>
<td>7%</td>
<td>17%</td>
<td>6%</td>
</tr>
</tbody>
</table>

N=3,030 N=808 N=134 N=340 N=991 N=150
Clinicians and health authorities are key influencers

<table>
<thead>
<tr>
<th></th>
<th>Total N=5153</th>
<th>White N=3030</th>
<th>Black N=808</th>
<th>Native American N=134</th>
<th>Asian N=340</th>
<th>English-speaking Hispanic N=991</th>
<th>Spanish speaking Hispanic N=150</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Your own doctor</strong></td>
<td>54%</td>
<td>56%</td>
<td>48%</td>
<td>51%</td>
<td>62%</td>
<td>53%</td>
<td>36%</td>
</tr>
<tr>
<td><strong>Dr. Anthony Fauci</strong></td>
<td>29%</td>
<td>29%</td>
<td>28%</td>
<td>22%</td>
<td>45%</td>
<td>29%</td>
<td>18%</td>
</tr>
<tr>
<td><strong>Someone from the CDC</strong></td>
<td>28%</td>
<td>26%</td>
<td>29%</td>
<td>38%</td>
<td>42%</td>
<td>32%</td>
<td>26%</td>
</tr>
<tr>
<td><strong>Someone from the FDA</strong></td>
<td>23%</td>
<td>21%</td>
<td>21%</td>
<td>21%</td>
<td>35%</td>
<td>27%</td>
<td>21%</td>
</tr>
<tr>
<td><strong>Joe Biden's Coronavirus Task Force</strong></td>
<td>18%</td>
<td>17%</td>
<td>18%</td>
<td>17%</td>
<td>21%</td>
<td>22%</td>
<td>20%</td>
</tr>
<tr>
<td><strong>Joe Biden</strong></td>
<td>14%</td>
<td>13%</td>
<td>16%</td>
<td>15%</td>
<td>16%</td>
<td>19%</td>
<td>21%</td>
</tr>
<tr>
<td><strong>A publication you respect</strong></td>
<td>9%</td>
<td>8%</td>
<td>7%</td>
<td>8%</td>
<td>17%</td>
<td>11%</td>
<td>7%</td>
</tr>
<tr>
<td><strong>A celebrity you admire and respect</strong></td>
<td>3%</td>
<td>3%</td>
<td>4%</td>
<td>6%</td>
<td>3%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td><strong>An athlete you admire and respect</strong></td>
<td>3%</td>
<td>3%</td>
<td>4%</td>
<td>3%</td>
<td>2%</td>
<td>4%</td>
<td>5%</td>
</tr>
<tr>
<td><strong>Other — Please specify</strong></td>
<td>14%</td>
<td>15%</td>
<td>17%</td>
<td>19%</td>
<td>7%</td>
<td>13%</td>
<td>9%</td>
</tr>
</tbody>
</table>

Nearly all respondents who replied “Other” stated that there was no one whose opinion would influence whether they would get vaccinated.
How CVS Health plans to address vaccine hesitancy and access

Data and reporting

Providers and other influencers as educators

Targeted messaging

Convenient access to vaccination services
CVS Pharmacy offers convenient locations to meet the needs of vulnerable populations

<table>
<thead>
<tr>
<th>Social vulnerability index</th>
<th>Number of stores</th>
<th>% of total US population within store radius</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 mile</td>
<td>2 miles</td>
</tr>
<tr>
<td>Very high (0.75-1.00)</td>
<td>2,095</td>
<td>8%</td>
</tr>
<tr>
<td>High (0.50-0.75)</td>
<td>2,462</td>
<td>8%</td>
</tr>
<tr>
<td>Moderate (0.25-0.50)</td>
<td>2,697</td>
<td>7%</td>
</tr>
<tr>
<td>Low (0-0.25)</td>
<td>2,692</td>
<td>7%</td>
</tr>
<tr>
<td>Total</td>
<td>9,946</td>
<td>30%</td>
</tr>
</tbody>
</table>
Potential prioritization of critical populations across phases

**Phase 1** (~261M+)

- **Phase 1a**
  - Health care personnel: ~21M
  - Long-term care facility residents: ~3M

- **Phase 1b**
  - Essential workers (non-healthcare): ~87M

- **Phase 1c**
  - Adults with high-risk medical conditions: >100M
  - Adults ≥ 65 years**: ~50M

**Additional prioritization to be determined in later phases**

- Staff and residents of other congregate living facilities
- People of all ages with conditions that put them at moderately higher risk
- Prisoners, detainees and staff
- Young adults
- Children
- Everyone residing in the United States who did not have access to the vaccine in previous phases

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*CDC ACIP Dec 2020 Meeting Presentation
**Excluding older adults in LTCFs
Our ongoing partnership with the federal government

CVS Health leadership meets regularly with members of Operation Warp Speed and the CDC to discuss:

**Supporting** distribution and administration of COVID-19 vaccine in LTC facilities and CVS Pharmacy locations at no cost to the patient—31K facilities have selected CVS Health

**Providing** community access through our national footprint

**Sharing** administrative information

**CVS Health made important enhancements** to our technology, infrastructure and processes to ensure we can be a trusted partner for payors, providers and the American people

Note: administration fee will be billed to patient’s insurance or the federal program for the uninsured
COVID-19 vaccine administration at long-term care (LTC) facilities:

We’re playing a critical role to ensure these vulnerable patients are protected
Ready to vaccinate LTC residents and staff

44,150
LTC facilities selected CVS Pharmacy with minimum 2 clinics per site

54%
of surveyed facilities selected CVS Pharmacy

~8M
Number of vaccines to be administered through this effort*

*reflects 2 doses per person
Leveraging depot stores for distribution to LTC facilities

Immunizing pharmacists pick up vaccines from the depot store on day of clinic

Key operational procedures

- Single depot store will manage inventory for multiple LTC facilities
- All product will be returned to the depot store at the end of the day for continued storage or waste handling
- Product will be transported using refrigerated storage totes
- Centralized Rapid Response team will monitor temperature excursions and guide on product handling

Reducing the number of locations managing vaccine will minimize inventory complexities and limit risk.
Clinic Model

1. CDC survey completed to request clinic from CVS
2. CVS selects clinic dates and times for each facility
3. Consent forms will be shipped directly to facility
4. Email notification of clinic assigned clinic dates
5. Confirmation phone calls to facility contact, confirming clinic dates and details
6. Confirmation email
7. Consent forms completion and copies of insurance cards for each participant
8. Multi Patient Upload form completed and submitted
9. Pharmacy team arrives on-site the day of the clinic, brings all supplies, and administers vaccines
10. Vaccination documentation provided to patient and facility
Long-term care on-site clinical logistics

Product and supplies are picked up at depot store

Clinic team arrives on site 30 minutes prior to the clinic

Set-up areas for registration table and immunization

Long-term care facility provides all patient consent forms and appointment schedule

Clinic technician processes Rx on laptop at the time of patient’s appointment

Pharmacist/immunizer verifies the Rx, consults with patient, and administers vaccine

After clinic product and supplies returned to depot store
CVS Health is well positioned to support COVID-19 vaccine administration and education
Using our nationwide footprint and experience to support vaccine administration

**Convenient access**
- Digital scheduling
- Nearly 10K retail locations nationwide
- 85%+ of the population within 10 miles of a CVS Pharmacy

**Trusted clinicians**
- Up to 90K immunizers: pharmacists and pharmacy technicians

**Experience**
- Incorporate learnings from this year’s flu season and extensive COVID-19 testing:
  - 15M+ flu vaccines
  - ~40K clinics for flu vaccination
Investments to ensure safe storage of all vaccine candidates

Our existing and newly-procured freezers can accommodate a range of storage requirements — all equipped with temperature alert technology. We will upgrade equipment as needed to ensure we can safely store all vaccines.

<table>
<thead>
<tr>
<th>Storage requirements</th>
<th>-20°C or warmer</th>
<th>-70°C or colder*</th>
<th>Currently unknown</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccine candidates</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AstraZeneca</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Johnson &amp; Johnson</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moderna</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Novavax</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vaxart</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pfizer</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biontech</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inovio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Merck</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Themis</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inovio</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Merck</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sanofi</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CVS prepared to support</td>
<td>Yes</td>
<td>Yes</td>
<td>To be assessed once requirements are known</td>
</tr>
</tbody>
</table>

*Stored at CVS Pharmacy in specialized shipping containers
Our patient experience

Our operation

1. Allocation provided to CVS Health from CDC/OWS

2. Predictive analytics used to forecast demand for use in allocating inventory and appointment capacity across stores by NDC

3. 1st & 2nd dose timeslots by location are made available to customers online based on projected available inventory and staffing capacity

4. Weekly and daily allocations in support of 1st & 2nd dose appointment demand

5. Doses shipped to stores accordingly

6. BOH updates are synchronized across all inventory systems

7. Vaccine doses administered based on appointment schedule, decrementing BOH
Enhanced digital flow will enable high touch, safe and efficient experience for in-store COVID-19 vaccinations

Joe Smith

... goes to CVS app to schedule both vaccine appointments
... arrives at CVS location ‘checks in’ for 1st dose and receives vaccine
... receives email and SMS confirmation of appointments
... receives vaccine record from 1st dose and email reminder about date and time of return for 2nd dose
... receives series of text message reminders that include link to complete necessary information ahead of 2nd dose
... goes back to CVS store for administration of 2nd dose at appropriate time
... additional outreach performed if patient misses appointment or is late to complete series
CVS Health will be ready to support patients seeking out only their second dose

**Patient already received 1st dose**

- Patient inputs COVID-19 vaccine information from the vaccine record card of their 1st dose into CVS Pharmacy digital appointment scheduler tool

  - Only stores that have the product the patients received for their first dose in stock will appear as available for appointments

**OR**

- Patient brings card to pharmacy for validation

  - If patient doesn’t have their card, our RPh or call center can look it up in patient’s immunization profile that queries state registries or reach out to prior provider

**Patient receives 2nd dose**
CVS Health is mobilizing broad reaching efforts to support COVID-19 vaccine awareness and education

Retail
- Distribute educational materials in-store + drive thru
  - National scale with nearly 10K retail locations
  - 4.5M consumers visit per day

Leverage trusted healthcare colleagues to support education in thousands of communities
- ~30K Pharmacists
- ~60K Pharmacy techs and interns
- ~3K MinuteClinic NPs and PAs

Communications drive to in-store and online vaccination information, support and appointment scheduler
- Circular
- POS terminal messaging
- Register receipt messaging
- In-store radio / IVR
- Prescription bags
- Rx Delivery inserts

Digital
- Offer consumers convenient access to online vaccine information, support and appointment scheduler
  - CVS.com – Dedicated vaccine resources / scheduling tool
  - SMS – Reaching 90M consumers
  - App integration

- Email – Reaching 20M ExtraCare members

Source: https://cvshealth.com/about/facts-and-company-information
What can employers do in the interim?

Encourage your employees to:

- Get their flu vaccine and pneumococcal vaccine
- Follow CDC guidelines, including wearing a mask when in public, regular hand washing, etc.
- Stay up-to-date on routine health care and preventive services
- Ensure safety of worksite including consideration of a testing strategy
- Consider Covid-19 vaccine education and services
Thank you
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The source for data in this presentation is CVS Health Enterprise Analytics unless otherwise noted.

All data sharing complies with applicable law, our information firewall and any applicable contractual limitations.

Adherence results and savings projections are based on CVS Caremark data. Actual results may vary depending on benefit plan design, member demographics, programs implemented by the plan and other factors. Client-specific modeling available upon request.

The Maintenance Choice program is available to self-funded employer clients that are subject to ERISA. Non-ERISA plans such as fully insured health plans, plans for city, state or government employees and church plans need CVS Caremark legal approval prior to adopting the Maintenance Choice program. Prices may vary between mail service and CVS Pharmacy due to dispensing factors, such as applicable local or use taxes.

Specialty Expedite is available exclusively for providers who use compatible electronic health record (EHR) systems, including Epic Systems and others that participate in the Carequality Interoperability Framework.

Specialty delivery options are available where allowed by law. In-store pick up is currently not available in Oklahoma. Puerto Rico requires first-fill prescriptions to be transmitted directly to the dispensing specialty pharmacy. Products are dispensed by CVS Specialty and certain services are only accessed by calling CVS Specialty directly. Certain specialty medication may not qualify. Services are also available at Long’s Drugs locations.

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