COVID-19 Epi Update
ACIP Meeting Summary

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ACIP Work Group Co-Lead

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For more information: www.cdc.gov/COVID19
Overview of U.S. COVID-19 Epidemiology
United States COVID-19 Cases by County
January 21 to August 26, 2020

USA
5,752,653
TOTAL CASES
CDC | Updated: Aug 26 2020 12:21PM

Trends in Number of COVID-19 Cases in the US
January 21 to August 26, 2020

USA
5,752,653 TOTAL CASES
[CDC | Updated: Aug 26 2020 12:21 PM]

https://www.cdc.gov/covid-data-tracker/index.html#trends
Select Commercial Laboratories Reporting to CDC: 
Number of Specimens Tested and Percent Positive for SARS-CoV-2 
March 29, 2020 – August 15, 2020

NSSP: Percentage of Visits for Influenza-Like Illness (ILI) and COVID-19-Like Illness (CLI) to Emergency Departments
Weekly National Summary, September 29, 2019 – August 15, 2020

Percent of Visits for CLI
Percent of Visits for ILI
NCHS Mortality Reporting System: Pneumonia, Influenza and COVID-19 Mortality
Data through the week ending August 15, 2020, as of August 20, 2020

Week 33
7.8%

Seasonal Baseline
Epidemic Threshold

% of Deaths Due to Pneumonia, Influenza or COVID-19

Trends in Number of COVID-19 Deaths in the US
January 21 to August 26, 2020

177,759 TOTAL DEATHS

https://www.cdc.gov/covid-data-tracker/index.html#trends
COVID-19 Epidemiology among At-Risk Populations
Healthcare Personnel

Healthcare Personnel (HCP) are essential workers defined as paid and unpaid persons serving in healthcare settings who have the potential for direct or indirect exposure to patients or infectious materials.
Cases among Healthcare Personnel

- CDC reports and routinely updates cases and deaths among healthcare personnel on the CDC website
  - Likely an underestimate

As of August 26th

<table>
<thead>
<tr>
<th>Cases &amp; Deaths among Healthcare Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data were collected from 4,355,851 people, but healthcare personnel status was only available for 1,012,298 (23.2%) people. For the 144,799 cases of COVID-19 among healthcare personnel, death status was only available for 101,839 (70.3%).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CASES AMONG HCP</th>
<th>DEATHS AMONG HCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>144,799</td>
<td>661</td>
</tr>
</tbody>
</table>

Healthcare Personnel within COVID-NET
March 1 to July 11, 2020

- Healthcare Personnel Type: N=512
  - Respiratory Therapist: 3 (<1%)
  - Physician: 23 (5%)
  - Nurse: 125 (24%)
  - Other: 276 (54%)
  - Not specified: 85 (17%)

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital-based patient care support (e.g. nursing assistant)</td>
<td>73</td>
</tr>
<tr>
<td>Other patient care</td>
<td>21</td>
</tr>
<tr>
<td>Housekeeping/Environmental Services</td>
<td>20</td>
</tr>
<tr>
<td>Other nursing home/LTCF staff</td>
<td>17</td>
</tr>
<tr>
<td>Technicians</td>
<td>15</td>
</tr>
<tr>
<td>Management</td>
<td>12</td>
</tr>
<tr>
<td>Home health worker</td>
<td>12</td>
</tr>
<tr>
<td>Emergency medical personnel</td>
<td>10</td>
</tr>
<tr>
<td>Social work/counselor</td>
<td>10</td>
</tr>
<tr>
<td>Pharmacy</td>
<td>9</td>
</tr>
<tr>
<td>Food Services</td>
<td>8</td>
</tr>
<tr>
<td>Dentistry</td>
<td>6</td>
</tr>
<tr>
<td>Laboratory</td>
<td>6</td>
</tr>
<tr>
<td>Other</td>
<td>57</td>
</tr>
</tbody>
</table>
Long Term Care Facility Workforce

- Disproportionately lower-wage workers
- **39%** of workers are 50 years of age or older
- **82%** of workers are female, **26%** non-Hispanic Black persons
- Staff can be shared among multiple facilities
- In many instances, COVID-19 activity increases among LTCF **staff** first, and then residents

Data from NHSN LTCF module:
Workers in Food Processing and Agriculture

- Among 14 states reporting total number of workers in affected meat and poultry processing plants from April–May 2020, COVID-19 diagnosed in 9.1% of workers
  - Among cases with race and ethnicity reported, 87% occurred among racial or ethnic minorities

- Outbreaks have been reported in many food production/agriculture sectors
  - Multiple factors that increase workers’ risk for exposure to SARS-CoV-2:
    - Prolonged close workplace contact with coworkers
    - Shared transportation and/or congregate housing
    - Lack of paid sick leave
Workers in Correction and Detention Facilities

- **Correction and detention** staff members can introduce the virus through their daily movements between the facility and the community.

- In an analysis of 16 U.S. prisons and jails, more than half of the facilities identified their first case of COVID-19 among **staff** members\(^1\).

\(^1\)Hagan et al. MMWR – August 21, 2020. [https://www.cdc.gov/mmwr/volumes/69/wr/mm6933a3.htm?s_cid=mm6933a3_w](https://www.cdc.gov/mmwr/volumes/69/wr/mm6933a3.htm?s_cid=mm6933a3_w)
Adults with increased risk for severe COVID-19 disease

- Accounting for presence of individual underlying medical conditions, higher hospitalization rates were observed among adults ≥65 years.

- Higher hospitalization rates observed for adults with underlying medical conditions, after accounting for age, race and ethnicity, and sex:
  - Obesity
  - Chronic kidney disease
  - Diabetes
  - Hypertension

https://medrxiv.org/cgi/content/short/2020.07.27.20161810v1
Overview of ACIP Meeting
Information Reviewed by Work Group

- Phase I Immunogenicity data from 2 COVID-19 mRNA vaccines
- Phase I Safety data from 2 COVID-19 mRNA vaccines
- Overview/Plans for Phase II/III studies for 2 COVID-19 mRNA vaccines
Immunogenicity and Safety Information Reviewed by Work Group
mRNA1273 (Moderna) N=130

- **Immunogenicity**
  - Neutralizing antibodies (pseudovirus neutralization assay titers) and binding antibodies (ELISA) measured 7 days post-dose 2
  - Responses similar to or exceeded convalescent sera comparison
  - Th1-biased CD4+ T-cell response
  - **100µg** dose selected for Phase III clinical trials

- **Safety**
  - Local and systemic symptoms followed for 7 days post-vaccination
    - Pain, myalgia, fatigue most common symptoms reported
  - Reactogenicity symptoms higher after second dose
  - No vaccine-related serious adverse events (SAEs) reported
Immunogenicity and Safety Information Reviewed by Work Group
BNT162b2 (Pfizer/BioNTech) N=195

- **Immunogenicity**
  - Neutralizing antibodies (50% neutralization titers) measured 7 days post-dose 2
  - Responses similar to or exceeded human convalescent panel
  - CD4+ and CD8+ T cell response demonstrated
  - Th1-biased CD4+ T-cell response
  - 30µg dose of BNT162b2 selected for Phase III clinical trials

- **Safety**
  - Local and systemic symptoms followed after administration
    - Fatigue, headache and muscle pain most common
  - Reactogenicity symptoms lower in older population (65-85 years)
Plans for Phase III

- Both vaccine candidates currently enrolling large (~30,000 people) Phase III efficacy trials
- Primary endpoints: symptomatic, virologically confirmed COVID-19 disease
- Attempting to enroll diverse populations:
  - Race and ethnicity
  - Age (<65 years and ≥65 years of age)
  - Underlying medical conditions
# Proposed scenarios for planning for D&A initial phase (Q4 2020)

Does not represent decisions; preliminary scenarios for planning

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Cumulative Doses available</th>
<th>Distribution requirements</th>
<th>Administration</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Vaccine candidate A is the first to demonstrate safety &amp; efficacy</td>
<td>2M Oct Nov Dec</td>
<td><strong>Shipped direct at --70-80°C on dry ice, to be used within 10 days</strong></td>
<td>• Vaccine can be stored at 2-8°C for 24 hours</td>
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<tr>
<td></td>
<td>10-20M</td>
<td></td>
<td>• 6 hour shelf life at room temperature</td>
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<tr>
<td></td>
<td>20-30M</td>
<td></td>
<td>• Unique diluent / kit requirements</td>
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<td>• Only shippable to large admin sites</td>
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<tr>
<td>2. Vaccine candidate B is the first to demonstrate safety &amp; efficacy</td>
<td>2M Oct Nov Dec</td>
<td><strong>Central distro capacity at -20°C, may be stored for months at -20°C</strong></td>
<td>• Vaccine can be stored at 2-8°C for 7 days</td>
</tr>
<tr>
<td></td>
<td>10M</td>
<td></td>
<td>• 6 hour shelf life at room temperature</td>
</tr>
<tr>
<td></td>
<td>15M</td>
<td></td>
<td>• As above</td>
</tr>
<tr>
<td>3. Vaccine candidates A and B demonstrate safety &amp; efficacy</td>
<td>3M Oct Nov Dec</td>
<td></td>
<td>• Administration site considerations as above</td>
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<tr>
<td></td>
<td>10-20M</td>
<td></td>
<td>• Complexity increases significantly if sites are administering 2 products with different requirements and differing dose schedules</td>
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</tbody>
</table>
Summary: Groups for early phase vaccination

- Overlapping
- Significant heterogeneity
- Accounts for > half of U.S. adults
- Need for additional sub-grouping

- Healthcare personnel ~17-20M
- Essential workers ~60-80M
- High Risk Medical Conditions >100M
- Adults ≥ 65 years old ~53M