Phase 1 allocation COVID-19 vaccine: Work Group considerations

Kathleen Dooling, MD MPH
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Work Group Considerations:
Goals of the COVID-19 Vaccine Program

- Ensure safety and effectiveness of COVID-19 vaccines
- Reduce transmission, morbidity, mortality of COVID-19 disease
- Help minimize disruption to society and economy, including maintaining healthcare capacity
- Ensure equity in vaccine allocation and distribution
Safety is paramount. Vaccine safety standards will not be compromised in efforts to accelerate COVID-19 vaccine development or distribution.

Inclusive clinical trials. Study participants should reflect groups at risk for COVID-19 to ensure safety and efficacy data are generalizable.

Efficient Distribution. During a pandemic, efficient, expeditious and equitable distribution and administration of approved vaccine is critical.

Flexibility. Within national guidelines, state and local jurisdictions should have flexibility to administer vaccine based on local epidemiology and demand.
Administration of COVID-19 vaccine will require a phased approach

Limited Doses Available

- Constrained supply, central distribution
- Cold chain & handling may require specialized equipment and high throughput

Phase 1a: Healthcare personnel

Phase 1b may include: Essential Workers, High risk Medical Conditions, Adults 65+

Projected short period of time for when doses are limited

Large Number of Doses Available

- Likely sufficient supply to meet demand
- Additional vaccine products allow a wider range of administration locations
- Broad administration network required (pharmacies, doctors offices, public health clinics, mobile clinics, FQHCs)
- Focus on increasing access for critical populations

Continued Vaccination

- Sufficient supply to meet demand
- Harness vaccine provider networks with proven ability to reach critical populations
- Enhance series completion

Volume doses available (per month)

Key factors

Likely admin strategies
Possible groups for Phase 1 vaccination

August ACIP meeting
Phase 1a:
- HCP

Phase 1b:
- Essential Workers
- High Risk Medical Conditions
- Adults ≥ 65 years old

September ACIP meeting
- Explore groups for phase 1b
  - Risk for COVID-19
  - Overlap between groups
  - Racial and ethnic composition
  - Summary of Work Group considerations

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

1) If constrained vaccine supply necessitates sequencing of groups in Phase 1b, what are the most important information gaps we need to fill for ACIP to make sequencing recommendations?

2) What is the correct balance of national guidance and local flexibility?
Phase 1a: Healthcare personnel
Healthcare personnel

- All paid and unpaid persons serving in healthcare settings who have the potential for direct or indirect exposure to patients or infectious materials

- Includes persons not directly involved in patient care but potentially exposed to infectious agents while working in a healthcare setting

Estimated Population ~17-20M

Examples:
- Hospitals
- Long term care facilities (assisted living facilities & skilled nursing facilities)
- Outpatient
- Home health care
- Pharmacies
- EMS
- Public health

https://www.bls.gov/ooh/healthcare/home.htm
<table>
<thead>
<tr>
<th>EQUITY</th>
<th>VALUES</th>
<th>FEASIBILITY</th>
<th>ACCEPTABILITY</th>
<th>BENEFITS &amp; HARMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support</td>
<td>- ↑ representation of some racial minority groups in subsets of HCPs - LTCF - home healthcare</td>
<td>- HCPS included as early phase group in all values-based allocation frameworks considered</td>
<td>- Large health systems have occupational health depts to facilitate vaccine clinics - May have -80C freezers</td>
<td>- Moderate/high rates of influenza vaccine acceptance. - High scientific literacy</td>
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<tr>
<td>Challenge</td>
<td></td>
<td>- Rural and LTCF, small clinics, home healthcare workers may be difficult to reach</td>
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Phase 1b: Essential workers (non-healthcare)
**Essential Workers (non-Healthcare)**

- Workers who are essential to continue critical infrastructure and maintain the services and functions Americans depend on daily

- Workers who cannot perform their duties remotely and must work in close proximity to others should be been prioritized

- Sub-categories of essential workers may be prioritized differently in different jurisdictions depending on local needs

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**Estimated Population** ~60M

**Examples:**
- Food & Agriculture
- Transportation
- Education
- Energy
- Water and Wastewater
- Law Enforcement

Essential Workers (non-healthcare): COVID-19 Risk

- By July 2020, 23 states reported outbreaks in 239 meat or poultry processing plants, resulting in ~16,000 cases in workers¹
  - 9% of workers diagnosed as cases by May (range =3%-25%)
- By mid-September, Corrections and Detention Facilities reported ~126,000 cases in residents and ~27,000 cases in staff²
  - In an analysis of 16 U.S. prisons and jails, 56% identified their first case of COVID-19 among staff members as opposed to incarcerated/detained persons³
- In NYC, seroprevalence among Correctional facilities workers and Fire Department workers exceeded that of the general population⁴

¹. MMWR July 10, 2020 https://www.cdc.gov/mmwr/volumes/69/wr/mm6927e2.htm?s_cid=mm6927e2_w
². UCLA COVID-19 Behind Bars Data Project
Overlap: Essential Worker & High-Risk Medical Conditions

- Obesity (BMI > 30): ~30%
- COPD: ~3%
- CKD: ~2%
- Cancer: ~4%
- CVD: ~4%
- Diabetes: ~7%
- Essential workers: ~4%
Selected essential industries by high risk medical conditions

- Grocery, convenience, and drug stores
- Food manufacturing
- Transit, postal, messengers, and couriers
- Trucking

Percent Prevalence among Industry Workers

- Cancer
- Coronary heart disease
- Chronic kidney disease
- COPD
- Diabetes
- Obesity (BMI≥30 kg/m2)

https://www.cdc.gov/mmwr/volumes/69/wr/mm6936a3.htm?s_cid=mm6936a3_w
Racial and Ethnic minorities in selected essential industries

Racial and Ethnic minorities in selected essential industries

~23% of essential workers live in low-income families (income <2X poverty line)

~10% of essential workers have no health insurance

Overlap: essential workers and adults ≥65 years

~16% of essential workers are ≥65 years old or live with someone who is

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

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<tbody>
<tr>
<td>Support</td>
<td>↑ representation of racial and ethnic minority groups overall and within some essential industries decisions</td>
<td>-Allocation frameworks all recognize essential workers as early phase vaccine recipients</td>
<td>-Mobile workers -Mobile PODS may be deployed to worksites -States will have to make prioritization decisions (↑flexibility)</td>
<td>-</td>
</tr>
<tr>
<td>Challenge</td>
<td>-Allocation frameworks are not aligned regarding the specific industries in phase I vs. phase II</td>
<td>-States will have to make prioritization decisions (↑workload, potential for policy differences State to State)</td>
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</tr>
<tr>
<td>Unknown</td>
<td>How do workers in individual industries value COVID-19 vaccination?</td>
<td></td>
<td></td>
<td>What is acceptability of COVID-19 vaccine among essential workers?</td>
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Phase 1b: High risk medical conditions
Adults with medical conditions at higher risk for severe COVID-19*

- Cancer
- Chronic kidney disease
- Chronic obstructive pulmonary disease (COPD)
- Immunocompromised state from solid organ transplant
- Obesity (BMI of 30 or greater)
- Serious heart conditions (heart failure, coronary artery disease or cardiomyopathies)
- Sickle cell disease
- Type 2 diabetes mellitus

** Estimated Population >100M **

<table>
<thead>
<tr>
<th>Examples†</th>
<th>% Population</th>
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<tbody>
<tr>
<td>Obesity</td>
<td>31%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>11%</td>
</tr>
<tr>
<td>COPD</td>
<td>7%</td>
</tr>
<tr>
<td>Heart Condition</td>
<td>7%</td>
</tr>
<tr>
<td>Chronic kidney</td>
<td>3%</td>
</tr>
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† [https://www.cdc.gov/mmwr/volumes/69/wr/mm6929a1.htm?s_cid=mm6929a1_w](https://www.cdc.gov/mmwr/volumes/69/wr/mm6929a1.htm?s_cid=mm6929a1_w)
High risk medical conditions: COVID-19 risk

- Nearly 90% of hospitalized adults had at least one high risk medical condition, and over 60% had 3 or more

- Obesity, chronic kidney disease, diabetes and hypertension are associated with hospitalization for COVID-19

- Among hospitalized COVID-19 patients, the adjusted rate ratios for underlying medical conditions association with death ranged from 1.19 (diabetes) to 1.39 (immunosuppression)

2. Ko et al. *Clinical Infectious Diseases*, ciaa1419, [https://doi.org/10.1093/cid/ciaa1419](https://doi.org/10.1093/cid/ciaa1419)
3. Kim et al, *Clinical Infectious Diseases*, ciaa1012, [https://doi.org/10.1093/cid/ciaa1012](https://doi.org/10.1093/cid/ciaa1012)
Prevalence of selected underlying conditions that increase risk for severe COVID-19 disease, by race and ethnicity

Source: National Center for Health Statistics, National Health Interview Survey, 2018

Estimates were not available for Hawaiian/other Pacific Islanders or for chronic kidney disease among American Indian/Alaska Native
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</thead>
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<tr>
<td><strong>Support</strong></td>
<td>↑ prevalence of diabetes and obesity among racial and ethnic minority groups</td>
<td>Allocation frameworks all support persons with high risk medical conditions as early phase vaccine recipients</td>
<td>-population with diagnosed medical conditions often connected with healthcare</td>
<td>-Moderate influenza vaccine coverage</td>
</tr>
<tr>
<td><strong>Challenge</strong></td>
<td>-diagnosis of condition may require access to healthcare</td>
<td>-100M group will require sub-prioritization -high degree of overlap between obesity and DM2 -difficulty to assess medical eligibility in mass vaccination clinics</td>
<td></td>
<td>?</td>
</tr>
<tr>
<td><strong>Unknown</strong></td>
<td>How do adults with high risk medical conditions value COVID-19 vaccination?</td>
<td></td>
<td>What is acceptability of COVID-19 vaccine among persons with high risk medical conditions?</td>
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Phase 1b: Adults $\geq 65$ years
Adults 65 years and older

Population in Millions

- 65 to 69 years: 17
- 70 to 74 years: 14
- 75 to 79 years: 9
- 80 to 84 years: 6
- 85 years and over: 6

Estimated Population ~53M
- 16% of the U.S. population
- ~3M person live in long-term care facilities

United States Census Bureau [https://www.census.gov/topics/population/older-aging.html](https://www.census.gov/topics/population/older-aging.html) [https://www.cdc.gov/nchs/fastats/nursing-home-care.htm](https://www.cdc.gov/nchs/fastats/nursing-home-care.htm)
Adults 65 years and older: COVID-19 Risk

- Adults 65 years and older represent 16% of COVID-19 cases but nearly 80% of COVID-19 deaths
- Adults 65 years and older have the highest cumulative rate of COVID-19 associated hospitalizations
- Older age is the strongest independent risk factor for in-hospital death

3. Kim et al, Clinical Infectious Diseases, ciaa1012, https://doi.org/10.1093/cid/ciaa1012
### Population 65 years and older by race and ethnicity

<table>
<thead>
<tr>
<th>Race or Ethnicity</th>
<th>Total Population</th>
<th>65 yrs and older</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hispanic or Latino</td>
<td>17.8%</td>
<td>8.0%</td>
</tr>
<tr>
<td>Not Hispanic or Latino</td>
<td>82.2%</td>
<td>92.0%</td>
</tr>
<tr>
<td>White</td>
<td>61.1%</td>
<td>77.3%</td>
</tr>
<tr>
<td>Black</td>
<td>12.3%</td>
<td>8.9%</td>
</tr>
<tr>
<td>AI/AN</td>
<td>0.7%</td>
<td>0.5%</td>
</tr>
<tr>
<td>Asian</td>
<td>5.4%</td>
<td>4.2%</td>
</tr>
<tr>
<td>NH/PI</td>
<td>0.2%</td>
<td>0.1%</td>
</tr>
<tr>
<td>Two or more races</td>
<td>2.4%</td>
<td>0.9%</td>
</tr>
</tbody>
</table>

Overlap: Adults ≥ 65 years & High Risk Medical Conditions

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

➢ ~39% of adults ≥ 65 years old have a high-risk medical condition for severe COVID-19

### Adults $\geq 65$ years: Summary of Work Group Considerations

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</table>
| **Support** | Allocation frameworks support early vaccination of older persons, especially those living in congregate settings | -good healthcare access through Medicare  
- high proportion with a healthcare/pharmacy home | -Moderate influenza vaccine coverage | ? |
| **Challenge** | Racial and ethnic minority groups under-represented among adults $\geq 65$ years | National Academies: older adults living at home, without high risk conditions, for Phase II vaccination | -mobility and ability to attend a mass vaccination clinic may be impaired for some | ? |
| **Unknown** | How do adults $\geq 65$ years value COVID-19 vaccination? | | What is acceptability of COVID-19 vaccine among adults $\geq 65$ years? |
Key Unknowns

- **Vaccine characteristics**
  - Magnitude and balance of benefits and potential risks
  - Storage/distribution/handling cold chain requirements
  - Vaccine efficacy/immunogenicity in younger and older adult

- **The pathway to approval**
  - Emergency Use Authorization (all adults vs younger adults)
  - Licensure

- **The number of doses available at time of approval and rate of scale-up**
Work Group Considerations: Next Steps

- Continue to build scientific understanding
  - epidemiology of the outbreak and risk in Phase 1 groups
  - modeling the impact of various vaccination strategies
  - interpretation of clinical trials safety data and plans for post-market safety monitoring

- Prepare Evidence to Recommendation Framework (EtR) for vaccines in Phase III clinical trials
  - prepare an equity domain to add to the EtR
  - gather evidence on value and acceptability of COVID-19 vaccine
  - once data are available from Phase III, GRADE safety and efficacy
  - prepare policy options for ACIP consideration
Questions:

1) If constrained vaccine supply necessitates sequencing of groups in Phase 1b, what are the most important information gaps we need to fill for ACIP to make sequencing recommendations?

2) What is the correct balance of national guidance and local flexibility?
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