

Vaccine Recommendations and Guidelines of the ACIP

Evidence Table for COVID-19 Vaccines Allocation in Phases 1b and 1c of the Vaccination Program

Question

What groups should be offered COVID-19 vaccine following Phase 1a of the COVID-19 vaccination program?

Background

Demand for COVID-19 vaccines is expected to exceed supply during the first months of the vaccination program. The ACIP COVID-19 Vaccines Work Group considered evidence related to SARS-CoV-2 epidemiology, vaccination program implementation, and ethical principles in developing the interim recommendation for allocation of COVID-19 vaccine following Phase 1a.

	Essential workers* (non-health care)	Persons aged ≥65 years	Persons with high-risk medical conditions
Allocation within Phase 1 of the COVID-19 vaccination program (post Phase 1a)	<p>Phase 1b – Frontline essential workers: first responders (e.g., firefighters and police officers), corrections officers, food and agricultural workers, U.S. Postal Service workers, manufacturing workers, grocery store workers, public transit workers, and those who work in the education sector (teachers and support staff members) as well as child care workers.</p> <p>Phase 1c – All other essential workers: workers in transportation and logistics, water and wastewater, food service, shelter and housing (e.g., construction), finance (e.g., bank tellers), information technology and communications, energy, legal, media, and public safety (e.g., engineers), and public health workers.</p>	<p>Phase 1b – Persons aged ≥75 years</p> <p>Phase 1c – Persons aged 65-74 years</p>	<p>Phase 1c – Persons aged 16-64 years[†] with medical conditions that increase the risk for severe COVID-19[§]</p>

Science

What is the burden (SARS-CoV-2 epidemiology, COVID-19 incidence, morbidity, mortality) and what are the potential harms and benefits of vaccination?

Non-health care essential workers, who hold jobs critical to the continued functioning of society, fall along a continuum of potential occupational risk of exposure to SARS-CoV-2, the virus that causes COVID-19.¹ Frontline essential workers were defined by ACIP as the subset of essential workers likely at highest risk for work-related exposure to SARS-CoV-2 because their work-related duties must be performed on site and involve being in close proximity (<6 feet) to the public or to coworkers.

Large COVID-19 outbreaks have been reported in multiple essential industries including manufacturing, construction, wholesale trade, and animal slaughtering and processing.²⁻⁴ Several factors contribute to workplace transmission in these industries, including high-density workplaces, prolonged close contact with coworkers, congregate/crowded housing, reliance on public or shared transportation, the need to hold multiple jobs, and frequent community contact among workers.

Between March-June 2020, the Utah Department of Health documented an outbreak associated COVID-19 cumulative incidence of >300 cases per 100,000 workers in manufacturing and wholesale trade, more than 3 times the overall outbreak-associated incidence

As of December 20, 2020, approximately 1.8 million COVID-19 cases and 180,000 deaths have been reported among adults aged ≥ 65 years; this age group accounted for 14.4% of cases and 80.7% of deaths in the U.S.⁸ By age group, 863,813 cases and 134,337 deaths occurred among persons aged ≥ 75 years and 981,657 cases and 46,627 deaths occurred among those aged 65-74 years.

Adults aged ≥ 65 years had a 2.6 higher likelihood of having hospitalizations due to COVID-19 than those aged 18-44 years.⁹ Approximately 40% of COVID-19 hospitalizations occurred in persons aged ≥ 65 years. COVID-19 hospitalization rates increase with age and are highest among older adults.¹⁰⁻¹² As of December 20, 2020, the cumulative COVID-19-associated hospitalization rate was 1,211 per 100,000 for persons aged ≥ 75 years and 642 per 100,000 for persons aged 65-74 years.¹³ Risk for COVID-19-associated hospitalization also increases with the number of underlying medical conditions.⁹

In an analysis of characteristics of persons who died with COVID-19 in the United States during February-May 2020, 74.8% of decedents were aged ≥ 65 years.¹⁴ COVID-19 mortality rates are also highest among older adults. Compared with persons aged 35-54 years, those aged 65-74

Adults of any age with certain underlying medical conditions are at increased risk for severe illness from COVID-19, which includes hospitalization, admission to intensive care unit, intubation or mechanical ventilation, or death.^{16,17}

Nearly 90% of persons hospitalized for COVID-19 have an underlying medical condition, most commonly hypertension (59%), obesity (46%), metabolic disease (48%), and cardiovascular disease (34%).^{12,17} Risk for COVID-19-associated hospitalization increases with the number of underlying medical conditions; people with 1 and 3 or more underlying conditions have a 2.5 and 5 times higher risk for hospitalization due to COVID-19, respectively.⁹ In 2018, the prevalence of five underlying medical conditions with the strongest evidence of association with increased risk for severe COVID-19 was 47.2% among residents aged ≥ 18 years from >3,100 US counties; by individual condition, prevalence was 35.4% (obesity), 12.8% (diabetes), 8.9% (chronic obstructive pulmonary disease), 8.6% (heart disease), and 3.4% (chronic kidney disease).¹⁸ The prevalence of some high-risk conditions varies by race/ethnicity (e.g., the prevalence of diabetes and obesity are higher in Black and American Indian/Alaska Native persons compared to White persons). There is

across the 15 industry sectors examined.² Among 23 states reporting COVID-19 outbreaks in meat and poultry processing facilities during April-May 2020, there were 16,233 cases in 239 facilities, including 86 (0.5%) COVID-19-related deaths.³ Among 14 states reporting the total number of workers in affected facilities, 9.1% of 112,616 workers received diagnoses of COVID-19. The percentage of workers with COVID-19 ranged from 3.1% to 24.5% per facility.³

In addition to increased occupational exposure risks, some industry and occupation groups have high percentages of demographic groups (e.g., racial and ethnic minorities and older workers) who experience a disproportionate burden of COVID-19-related morbidity and mortality.⁵ At least 15% of workers in the transit/postal/messenger/courier and trucking industries were >60 years.⁵ While Blacks comprise 12% of all workers, they are overrepresented in public transit (26%), child care/social services (19%), trucking/warehouse/Postal Service (18%), and grocery/convenience/drug stores (14%); Hispanics make up 17% of the workforce but are overrepresented in building cleaning services (40%), trucking/warehouse/Postal Service (20%), and grocery/convenience/drug stores (19%).⁶

years have a 8 times higher risk, and those aged 75 years and older a >30 times higher risk for COVID-19 deaths.¹⁵

Modeling data suggest that initially vaccinating adults aged ≥ 65 years in Phase 1b averts approximately 1%–4% more deaths, compared to targeting high-risk adults or essential workers, when only protection of vaccine recipients against infection (vs. transmission) is considered.⁷

geographic disparity in the distribution of these conditions with higher prevalence in counties in the southeastern United States and in more rural counties.¹⁸

In an analysis of characteristics of persons who died with COVID-19 in the United States during February-May 2020, at least one underlying medical condition was reported for 83.1% of decedents aged <65 years.¹⁴

Modeling data suggest that initially vaccinating high-risk adults or essential workers in Phase 1b averts approximately 1%–5% more infections, compared to targeting persons aged ≥ 65 years, when only protection of vaccine recipients against infection (vs. transmission) is considered.⁷

Several other characteristics of essential workers that increase the risk for severe COVID-19 have been described. In a limited subset of non-health care industries, obesity and hypertension were the most common conditions in every essential worker group; significantly higher rates of >1 underlying medical condition were found for transit (asthma and diabetes) and trucking (chronic obstructive pulmonary disease, obesity, and severe obesity).⁵ In addition, almost one quarter of essential workers live in low-income families.⁶

Modeling data suggest that initially vaccinating high-risk adults or essential workers in Phase 1b averts approximately 1%–5% more infections, compared to targeting persons aged ≥65 years, when only protection of vaccine recipients against infection (vs. transmission) is considered.⁷

Implementation

What is the feasibility of vaccinating this group and how does the group value and accept COVID-19 vaccination?

Vaccine-specific storage, handling, and administration requirements may affect the feasibility of implementation. For example, vaccines that require ultra-low-temperature freezers or dry ice may limit early distribution efforts to centralized sites with necessary freezer equipment and high vaccine throughput. Vaccines that are stable at refrigerator temperatures will increase the availability of

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increase the availability of vaccination across a range of providers and community locations. Additionally, large minimum size for vaccine orders may preclude involvement of small clinics.

Reaching workers in rural locations, shift workers, those with multiple jobs or working in small cohorts may be challenging. Personal investments in time and travel to obtain vaccine may be a barrier for some essential worker groups.

Minimizing barriers to access vaccination for frontline essential workers, such as vaccine clinics at or close to the place of work, are optimal. Most jurisdictions have allocation micro-plans which include prioritization among non-health care essential workers when vaccine supply is limited. Jurisdictional approaches include on-site employer/occupational clinics, use of pharmacies, mobile clinics, and health department point of dispensing strike teams.

Identification of eligibility for some categories of essential workers may need to be based on self-report.

In surveys conducted in the general population, between 60% and 87% of respondents supported prioritization of early allocation of COVID-19 vaccine supply to essential non-health care

increase the availability of vaccination across a range of providers and community locations. Additionally, large minimum size of vaccine orders may preclude involvement of small clinics.

Health care or medical homes, such as provider offices, or pharmacies could be better suited for vaccinating persons in this age group. Although providers may be able to store vaccines that require standard freezer or refrigerated temperatures, the minimum order size may require consolidation of locations for vaccine administration. Personal investments in time and travel to obtain vaccine may be a barrier for some people in this group.

In a survey of US adults conducted in August 2020, 71% of respondents supported early allocation of COVID-19 vaccine supply to seniors (defined as aged ≥ 55 years).¹ Similarly, priority vaccination of persons aged ≥ 65 years, or elderly was supported by 73% and 82%, respectively, of respondents in polls conducted in December 2020.^{2,3}

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Determining eligibility may be challenging; health care or medical homes, such as provider offices including subspecialty providers, or pharmacies could be better suited for verifying underlying medical conditions. Although, providers may be able to store the vaccines that require standard freezer or refrigerated temperatures, the minimum order size may require consolidation of locations for vaccine administration. Personal investments in time and travel to obtain vaccine may be a barrier for some people in this group.

In surveys conducted in the general population, between 68% and 84% of respondents supported prioritization of early allocation of COVID-19 vaccine supply to persons who are high risk because of medical problems.¹⁻³

In a CDC-sponsored vaccine intent survey in September 2020, 65% of persons with ≥ 1 high risk condition reported that they would likely get a COVID-19 vaccine (CDC unpublished data).

workers,
police/fire/rescue and
teachers.¹⁻³

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September 2020, 60% of
non-health care essential
workers reported that
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COVID-19 vaccine (CDC
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Ethics

Does vaccinating this
group advance the ethical
principles for COVID-19
vaccine allocation¹:

- Maximize benefits
and minimize harms
- Promote justice
- Mitigate health
inequities

Maximize benefits and minimize harms:

Vaccination benefits both
the individual essential
worker and the
population overall. These
benefits include
reduction of COVID-19-
associated morbidity and
mortality in essential
workers which in turn
preserves services critical
for the COVID-19
response and
maintenance of the
overall functioning of
society. The ability of
essential workers to
remain healthy helps to
minimize social and
economic disruption.

Promote justice:

Vaccination addresses
the elevated occupational
risk for SARS-CoV-2
exposure for frontline
and other essential
workers who have
varying levels of close
interaction with the
public or others in the
workplace; may be
unable to control social
distancing in the
workplace; and are
unable to work from
home. Working remotely
is an option for some but
not the majority of
essential workers; e.g.,
57% of employees in the
financial industry can
work remotely compared

Maximize benefits and minimize harms:

Persons
aged 75 years and older
are at high risk of COVID-
19 associated morbidity
and mortality and
experience the highest
burden of COVID-19
hospitalization. Persons
aged 65-74 years are at
increased risk for severe
COVID-19 with high rates
of hospitalization.
Vaccination benefits
persons in these groups
by decreasing the risk of
COVID-19 associated
morbidity and mortality;
reductions in COVID-19
associated
hospitalizations can help
ease the burden on
strained health care
systems.

Promote justice: Equal
access to vaccine will be
aided by COVID-19
vaccines whose storage,
handling, and
administration
requirements allow for
distribution and use in
most community
settings. Vaccination,
however, will require
focused outreach to
persons ≥ 65 years who
have no or limited access
to health care or
experience inequities in
social determinants of
health.

Maximize benefits and minimize harms:

Persons
with high-risk medical
conditions have an
increased risk of severe
COVID-19 disease and
associated
hospitalization.
Vaccination benefits
persons in this group by
decreasing the risk of
COVID-19 associated
morbidity and mortality;
reductions in COVID-19
associated
hospitalizations can help
ease the burden on
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Mitigate health

inequities: Vaccination of
persons in this group
addresses the increased
prevalence of some high-
risk medical conditions
among racial and ethnic

with 14% of those who work in transportation and utilities.¹

Equal access to vaccine will be aided by COVID-19 vaccines whose storage, handling, and administration requirements allow for distribution and use in most community settings. Vaccination, however, will require focused outreach to frontline and other essential workers to reduce access-related barriers to vaccination. Analyses of self-reported influenza and pneumococcal vaccine receipt indicate low coverage among several occupational groups (e.g., the 2013 Behavioral Risk Factor Surveillance System survey found that $\leq 25\%$ of workers in production, installation/maintenance/repair, transportation/material moving, food preparation and serving, construction/extraction, and farming/fishing/forestry occupations reported receiving influenza vaccine in the previous 12 months);² $< 25\%$ of workers 60 years and older in the construction, manufacturing, and transportation/warehousing/utilities sectors reported receiving pneumococcal vaccine in cross-sectional surveys conducted during 1997-2007).³

Mitigate health inequities: COVID-19 vaccination helps to address the disproportionate burden of COVID-19 among some

Mitigate health

inequities: Although racial and ethnic minority groups are underrepresented among persons ≥ 65 years, some minority groups (non-Hispanic American Indian or Alaska Native, non-Hispanic Black, and Hispanic or Latino) have disproportionate COVID-19 related hospitalization and death rates.^{8,9} For example, during March 1, 2020–December 12, 2020, compared with non-Hispanic White persons aged ≥ 65 years, crude hospitalization rates were 2.1 times higher among Non-Hispanic American Indian or Alaska Native persons; 2.4 times higher among Hispanic or Latino persons; and 2.5 times higher among non-Hispanic Black persons.⁸

Adults ≥ 65 years of age are a heterogeneous population; a strict age-based criterion could inadvertently increase disparities due to racial and social inequities, such as occupation, income, and access to health care.^{10,11}

among racial and ethnic minority groups and among persons living in rural areas.

Vaccination of persons in this group could inadvertently increase health inequities because diagnosis of high-risk medical conditions requires access to health care. Members of racial/ethnic minority groups may be more likely to face barriers to obtaining affordable, high-quality health care (e.g., limited access to health insurance, transportation, and childcare).¹²

racial and ethnic minorities who are overrepresented in subsets of essential workers. For example, from March through May 2020 among 5,721 food manufacturing and agriculture workers with COVID-19, 83% occurred in racial or ethnic minority groups;⁴ Hispanic and nonwhite workers accounted for 73% of workplace outbreak-associated COVID-19 cases in Utah despite representing only 24% of Utah workers in 15 affected industry sectors;⁵ and in U.S. meat and poultry processing facilities, among 9,919 COVID-19 cases with race/ethnicity information reported from April through May 2020, 87% occurred among racial and ethnic minority workers.⁶

Long-standing inequities in social determinants of health apart from occupation, such as healthcare access and utilization, education, and income, can impede management of medical conditions that increase the risk for severe COVID-19 among racial and ethnic minority groups.⁷

*Essential workers: These workers perform job tasks across critical infrastructure sectors, ensuring continuity of functions critical to public health, safety, economic and national security (<https://www.cisa.gov/identifying-critical-infrastructure-during-covid-19> ).

†As of December 18, 2020, only the Pfizer-BioNTech COVID-19 vaccine is authorized and may be used among persons aged 16-17 years. The Moderna COVID-19 vaccine is authorized and recommended for use among persons aged ≥18 years.

§Adults with high risk medical conditions: Adults of any age with certain underlying medical conditions are at increased risk for severe illness from the virus that causes COVID-19. Severe illness from COVID-19 is defined as hospitalization, admission to the ICU, intubation or mechanical ventilation, or death (<https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/index.html>).

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