COVID-19 Vaccine: Considerations for Future Planning

Sara Oliver, MD, MSPH
ACIP Meeting
February 24, 2023
Considerations for future planning
COVID-19 vaccines

COVID-19 vaccines: Where we are now

COVID-19 vaccines: Where we are going
Considerations for future planning
COVID-19 vaccines

COVID-19 vaccines: Where we are now

How do we get there?

COVID-19 vaccines: Where we are going
Considerations for future planning
COVID-19 vaccines

Where we are now:
Current recommendations
Vaccination rates
Hospitalization rates

COVID-19 vaccines: Where we are now

COVID-19 vaccines: Where we are going

Goal:
Simple recommendations

How we get there:
How frequently should people get a COVID-19 vaccine?
Are there groups/populations who should have >1 vaccine per year?
### U.S. COVID-19 Vaccination Coverage (%) of Total Population by Age Group — February 8, 2023

<table>
<thead>
<tr>
<th>Coverage / Age (years)</th>
<th>&lt;2</th>
<th>2-4</th>
<th>5-11</th>
<th>12-17</th>
<th>18-24</th>
<th>24-49</th>
<th>50-64</th>
<th>&gt;65</th>
</tr>
</thead>
<tbody>
<tr>
<td>At least 1-dose†</td>
<td>7.6</td>
<td>10.3</td>
<td>39.7</td>
<td>71.9</td>
<td>81.9</td>
<td>85.2</td>
<td>95.0</td>
<td>95.0</td>
</tr>
<tr>
<td>Completed primary series</td>
<td>3.7</td>
<td>5.5</td>
<td>32.6</td>
<td>61.6</td>
<td>66.5</td>
<td>72.0</td>
<td>83.7</td>
<td>94.2</td>
</tr>
<tr>
<td>1st monovalent booster*</td>
<td>-</td>
<td>-</td>
<td>3.3</td>
<td>16.6</td>
<td>27.2</td>
<td>45.3</td>
<td>64.6</td>
<td></td>
</tr>
<tr>
<td>2nd monovalent booster *</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10.6</td>
<td>25.3</td>
</tr>
<tr>
<td>Bivalent booster**</td>
<td>0.2</td>
<td>0.3</td>
<td>4.0</td>
<td>7.0</td>
<td>6.7</td>
<td>11.2</td>
<td>20.3</td>
<td>40.8</td>
</tr>
<tr>
<td>Unvaccinated</td>
<td>92.4</td>
<td>89.7</td>
<td>60.3</td>
<td>28.1</td>
<td>18.1</td>
<td>14.8</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

*Monovalent booster dose coverage as of August 26, 2022
** Bivalent booster coverage is independent of 1st and 2nd dose monovalent coverage
†Note: Coverage is capped at 95%

U.S. COVID-19 vaccine uptake by age group, August 2021-January 2023

Source: IZ Data Lake
COVID-19 message fatigue challenges vaccine uptake

- Recent studies reflect profound COVID-19 message fatigue\(^1\), desire to end use of mitigation\(^2\), and a common perception among adults that immunity is sufficient without further boosters\(^3\)

- Barriers to vaccine access persist for some populations, including but not limited to:
  - People living in rural areas\(^4\)
  - People experiencing homelessness\(^5\)
  - People with disabilities\(^6\)
  - "If I can't get to it, it doesn't exist for me."

- Despite improvements in vaccine equity after primary series vaccination, disparities in booster coverage have emerged\(^7\)

2. CDC’s State of Vaccine Confidence Insights Reports, Jan 26 2023: [CDC’s State of Vaccine Confidence Insights Report](https://www.cdc.gov/vaccines/resources/publications/state-of-vaccine-confidence-supporting-docs.html)
4. Assessing barriers to access and equity for COVID-19 vaccination in the US - PMC (nih.gov)
7. [COVID-19 Vaccination Coverage, by Race and Ethnicity — National Immunization Survey Adult COVID Module, United States, December 2020–November 2021](https://www.cdc.gov/mmwr/preview/mmwrhtml/mm7141a2.htm)
Trends in weighted variant proportion estimates & Nowcast
United States, November 6, 2022-February 11, 2023

Collection date, week ending

Estimated Number of Reported COVID-19 Cases by Variant
Variant Proportions Scaled by Positive Nucleic Acid Amplification Test (NAAT) Counts

Seroprevalence by Vaccine and Infection History Among Adult U.S. Blood Donors, January-June 2022


Gray boxes indicate potential reporting delays. Interpretation of trends should be excluded from these weeks.
Monthly Age-Adjusted Rates of Lab-Confirmed Hospitalizations by Vaccination Status among Adults Ages ≥18 Years — COVID-NET, January 2021–December 2022

In December 2022, compared to adults who received an updated bivalent booster dose, the monthly rates of hospitalization were

- 16x higher among unvaccinated and
- 2.6x higher in vaccinated adults without an updated booster dose

Data are based on all hospitalizations regardless of reason for admission. **Unvaccinated**: No recorded doses of COVID-19 vaccine. **Primary series ± ≥1 booster**: Completed a primary series with or without ≥1 booster dose but did not receive an updated bivalent booster dose. **Vaccinated, but no bivalent booster**: Completed a primary series with or without ≥1 booster dose but did not receive an updated bivalent booster dose. **Updated bivalent booster**: Received updated bivalent booster dose. Persons with partial or unknown vaccination status are excluded. See https://covid.cdc.gov/covid-data-tracker/#covidnet-hospitalizations-vaccination for complete definitions of vaccination categories.
COVID-19 vaccine
Where we are now

- Current COVID-19 vaccine recommendations are complex
- Uptake of current bivalent vaccine is low
- SARS-CoV-2 continues to evolve, but recent virus evolution has not led to large population-level surges in cases or hospitalizations
- Most adults have a prior infection, prior vaccination, or both
- Hospitalization rates are highest older adults, but remain low among people who have received a bivalent booster
Considerations for future planning
COVID-19 vaccines

How frequently should people get a COVID-19 vaccine?
Are there groups/populations who should have >1 vaccine per year?

Goal:
Simple recommendations
How frequently should people get a COVID-19 vaccine?

- Increases in COVID-19 cases (left) and hospitalizations (right) have occurred:
  - During the **winter months** and/or
  - Due to development of new **immune escape variant**

![Weekly Trends in Number of COVID-19 Cases in The United States Reported to CDC](https://covid.cdc.gov/covid-data-tracker/#trends_weeklycases_select_00)

![Admissions from October 2021 – February 2023 highlighted](https://covid.cdc.gov/covid-data-tracker/#new-hospital-admissions)
How frequently should people get a COVID-19 vaccine?

### With monovalent COVID-19 vaccines, declines in VE noted over time

- Likely impacted by both **time since vaccine dose** and continued **virus evolution**
- Additional vaccine doses restored protection lost over time
- Continue to monitor impact of waning and virus evolution on VE for bivalent vaccines

#### VISION: mRNA VE for hospitalizations among immunocompetent adults ≥18 years by number of doses and time since last dose receipt, late-Mar–late-Jul 2022

<table>
<thead>
<tr>
<th>Vaccination status (days since most recent dose)</th>
<th>Total</th>
<th>CIU cases</th>
<th>Days since most recent dose, median (IQR)</th>
<th>Adjusted VE % (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BA.2/BA.2.12.1 period</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unvaccinated</td>
<td>9,082</td>
<td>494</td>
<td></td>
<td>Ref.</td>
</tr>
<tr>
<td>2 doses [14-149]</td>
<td>*</td>
<td>*</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>2 doses [≥150]</td>
<td>5,118</td>
<td>393</td>
<td>871 [808, 913]</td>
<td>24 (13 - 35)</td>
</tr>
<tr>
<td>3 doses [7-119]</td>
<td>2,250</td>
<td>72</td>
<td>94 [74, 108]</td>
<td>69 (58 - 76)</td>
</tr>
<tr>
<td>3 doses [≥120]</td>
<td>7,886</td>
<td>519</td>
<td>168 [146, 191]</td>
<td>52 (44 - 59)</td>
</tr>
<tr>
<td>4 doses [7-59)**</td>
<td>1,204</td>
<td>74</td>
<td>27 [17, 41]</td>
<td>80 (71 - 85)</td>
</tr>
<tr>
<td><strong>BA.4/BA.5 period</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unvaccinated</td>
<td>4,578</td>
<td>913</td>
<td></td>
<td>Ref.</td>
</tr>
<tr>
<td>2 doses [14-149]</td>
<td>*</td>
<td>*</td>
<td></td>
<td>*</td>
</tr>
<tr>
<td>2 doses [≥150]</td>
<td>3,392</td>
<td>619</td>
<td>445 [369, 484]</td>
<td>25 (15 - 33)</td>
</tr>
<tr>
<td>3 doses [7-119]</td>
<td>335</td>
<td>32</td>
<td>76 [46, 100]</td>
<td>49 (20 - 68)</td>
</tr>
<tr>
<td>3 doses [≥120]</td>
<td>5,030</td>
<td>889</td>
<td>229 [199, 258]</td>
<td>34 (25 - 42)</td>
</tr>
<tr>
<td>4 doses [7-59)**</td>
<td>717</td>
<td>81</td>
<td>38 [23, 49]</td>
<td>60 (42 - 75)</td>
</tr>
<tr>
<td>4 doses [≥60-119)**</td>
<td>1,186</td>
<td>157</td>
<td>84 [73, 97]</td>
<td>50 (41 - 67)</td>
</tr>
</tbody>
</table>

* Estimates with confidence intervals >60 percentage points are not shown.
** Only estimated among adults ≥20 years of age

VE = vaccine effectiveness

**BA.2/BA.2.12.1 estimates:** Link-Gelles et al. MMWR: [https://www.cdc.gov/mmwr/volumes/71/wr/mm7129e1.htm](https://www.cdc.gov/mmwr/volumes/71/wr/mm7129e1.htm)

**BA.4/BA.5 estimates:** Link-Gelles et al. medRxiv: [https://www.medrxiv.org/content/10.1101/2022.10.04.22280459v1](https://www.medrxiv.org/content/10.1101/2022.10.04.22280459v1). Individuals with prior infections excluded. Adjusted for calendar time, geographic region, age, sex, race, ethnicity, local virus circulation, respiratory or non-respiratory underlying medical conditions, and propensity to be vaccinated.
How frequently should people get a COVID-19 vaccine?

- Time since last dose impacts COVID-19 vaccine effectiveness
  - Relative VE of bivalent boosters (meaning the *additional benefits* of a bivalent booster) are higher the longer it has been since the last monovalent dose

- Safety is also likely improved with longer time between doses
  - Myocarditis risk appears lower with longer time between doses

**VISION:** VE of bivalent COVID-19 boosters against hospitalizations among adults aged ≥18 years – VISION Network, September–December 2022

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VE = vaccine effectiveness
CDC unpublished data. Updated from: Tenforde et al. MMWR December 16, 2022: [https://www.cdc.gov/mmwr/volumes/71/wr/mm715152e1.htm](https://www.cdc.gov/mmwr/volumes/71/wr/mm715152e1.htm)
How frequently should people get a COVID-19 vaccine?

Summary

- Winter months and immune escape variants have impacted COVID-19 epidemiology
  - This past winter did not see same level of increases in cases/hospitalizations as previous winters
- Time since last COVID-19 vaccine dose may both increase the incremental benefits of a COVID-19 vaccine, and decrease the risk of myocarditis
- Vaccine protection likely declines over time
- A plan for a **fall booster dose** could provide added protection, at a time when many would be ~1 year from last dose
  - Future epidemiology and SARS-CoV-2 virus evolution could help determine the need for continued annual boosters
Are there populations who still need a primary series?  
Unvaccinated young children

- While most adults have completed a primary series, most children ages 6 months – 4 years remain **unvaccinated**
- For most older children, adolescents, and adults, future doses will be additional ‘boost’ after prior infection, prior vaccination, or both
- Young children will continue to age into the vaccine recommendations at 6 months and could be SARS-CoV-2 naive
- Some population of **young children** likely still need a ‘prime’ and ‘boost’ to optimize immunity

<table>
<thead>
<tr>
<th>Coverage / Age (years)</th>
<th>&lt;2 years</th>
<th>2–4 years</th>
</tr>
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<tbody>
<tr>
<td>At least 1-dose</td>
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<td>10.3</td>
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<td>5.5</td>
</tr>
<tr>
<td>Unvaccinated</td>
<td>92.4</td>
<td>89.7</td>
</tr>
</tbody>
</table>
Parental intent to get a COVID-19 vaccine for their child and trusted places for children to receive a COVID-19 vaccine

- For parents with an unvaccinated or under-vaccinated child aged 6 – 23 months, 38% intend to get their child vaccinated in the next month, whereas 39.4% say they ‘definitely’ or ‘probably’ will not vaccinate their child and 23% are unsure.
- Additionally, 38% of parents of children ages 2 – 4 years say they ‘definitely’ or ‘probably’ will get their child vaccinated in the next month, while 43.2% say they ‘definitely’ or ‘probably’ will not and 18.4% are unsure.
- Doctor’s offices and clinics were the most trusted place for parents to have their child receive a COVID-19 vaccine, as reported by 51.1% of parents of children aged 6 – 23 months and 52.5% of parents of children aged 2 – 4 years.

CDC/University of Iowa/RAND survey. Unpublished data.
Are there populations who still need a primary series?
Unvaccinated young children

- Pediatric hospitalization rates are higher among children 6 months to <2 years of age, compared to children 2–4 years of age

Weekly Population-Based Rates of COVID-19-Associated Hospitalizations among Children Ages 6 months-4 Years
— COVID-NET, March 2020–February 2023
Pediatric SARS-CoV-2 Infection-Induced and Combined (Vaccine- and Infection-Induced) Seroprevalence from U.S. Commercial Laboratories — March–December 2022

**Infection-induced**

<table>
<thead>
<tr>
<th>Month</th>
<th>Seroprevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar-Apr</td>
<td>63</td>
</tr>
<tr>
<td>May-Jun</td>
<td>82</td>
</tr>
<tr>
<td>Jul-Aug</td>
<td>89</td>
</tr>
<tr>
<td>Sep-Oct</td>
<td>93</td>
</tr>
<tr>
<td>Nov-Dec</td>
<td>99</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Month</th>
<th>Seroprevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar-Apr</td>
<td>75</td>
</tr>
<tr>
<td>May-Jun</td>
<td>85</td>
</tr>
<tr>
<td>Jul-Aug</td>
<td>92</td>
</tr>
<tr>
<td>Sep-Oct</td>
<td>97</td>
</tr>
<tr>
<td>Nov-Dec</td>
<td>99</td>
</tr>
</tbody>
</table>

**Combined (vaccine- and infection-induced)**

<table>
<thead>
<tr>
<th>Month</th>
<th>Seroprevalence (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mar-Apr</td>
<td>63</td>
</tr>
<tr>
<td>May-Jun</td>
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<tr>
<td>Jul-Aug</td>
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</tr>
<tr>
<td>Sep-Oct</td>
<td>93</td>
</tr>
<tr>
<td>Nov-Dec</td>
<td>99</td>
</tr>
</tbody>
</table>

Source: [https://covid.cdc.gov/covid-data-tracker/#pediatric-seroprevalence](https://covid.cdc.gov/covid-data-tracker/#pediatric-seroprevalence) and unpublished data from CDC
Are there populations who still need a primary series?

Summary

- Children ages <2 years have higher COVID-19 hospitalization rates than older children.
- Children ages <4 years are less likely to have both prior infection and prior vaccination.
- Children have frequent visits to healthcare providers.
- The Work Group discussed continued primary series recommendations for young children.
- Both ages 6 months-2 years and ages 6 months-4 years were discussed without a clear consensus.

https://www.healthychildren.org/English/family-life/health-management/Pages/Well-Child-Care-A-Check-Up-for-Success.aspx
Should older adults be recommended for >1 vaccine annually?

- Hospitalization rates are highest among adults 65–74 years and ≥75 years of age.
In December 2022, adults ages ≥65 years who received a bivalent booster had 12.8X lower risk of hospitalization for COVID-19 compared to unvaccinated people and 2.5X lower risk of hospitalization compared to those vaccinated without a bivalent booster.
Should older adults be recommended for >1 vaccine annually?

- **Immunity** and vaccine response is different in older adults
- Patterns of vaccine effectiveness, including waning, may be different in older adults
- Waning for bivalent VE against hospitalization, including among older adults, isn’t yet known

**ICATT:** Relative VE of bivalent booster against symptomatic infection in adults aged ≥ 18 years, December 1, 2022 - February 13, 2023

<table>
<thead>
<tr>
<th>Age group, years/mRNA Dosage Pattern</th>
<th>Total tests</th>
<th>SARS-CoV-2 positive, N (row %)</th>
<th>VE (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-49 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received 2-3 monovalent doses only (Ref)*</td>
<td>182,741</td>
<td>82,043 (45)</td>
<td>Ref</td>
</tr>
<tr>
<td>2 weeks-1 month since bivalent booster</td>
<td>10,758</td>
<td>3,127 (29)</td>
<td>51 (49 to 53)</td>
</tr>
<tr>
<td>2-3 months since bivalent booster</td>
<td>32,577</td>
<td>10,206 (31)</td>
<td>45 (43 to 46)</td>
</tr>
<tr>
<td>4-5 months since bivalent booster</td>
<td>9,197</td>
<td>2,882 (31)</td>
<td>41 (38 to 44)</td>
</tr>
<tr>
<td>50-64 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received 2-4 monovalent doses only (Ref)</td>
<td>60,822</td>
<td>31,878 (52)</td>
<td>Ref</td>
</tr>
<tr>
<td>2 weeks-1 month since bivalent booster</td>
<td>6,223</td>
<td>2,331 (37)</td>
<td>46 (43 to 49)</td>
</tr>
<tr>
<td>2-3 months since bivalent booster</td>
<td>18,399</td>
<td>7,898 (43)</td>
<td>32 (29 to 34)</td>
</tr>
<tr>
<td>4-5 months since bivalent booster</td>
<td>4,837</td>
<td>2,030 (42)</td>
<td>28 (23 to 32)</td>
</tr>
<tr>
<td>≥65 years</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Received 2-4 monovalent doses only (Ref)</td>
<td>28,307</td>
<td>14,246 (50)</td>
<td>Ref</td>
</tr>
<tr>
<td>2 weeks-1 month since bivalent booster</td>
<td>4,579</td>
<td>1,788 (39)</td>
<td>38 (34 to 42)</td>
</tr>
<tr>
<td>2-3 months since bivalent booster</td>
<td>13,071</td>
<td>8,080 (42)</td>
<td>27 (25 to 30)</td>
</tr>
<tr>
<td>4-5 months since bivalent booster</td>
<td>5,796</td>
<td>2,431 (42)</td>
<td>21 (15 to 26)</td>
</tr>
</tbody>
</table>

Unpublished CDC data. From ACIP presentation February 24, 2022
Should **older adults** be recommended for >1 vaccine annually?

**Summary**

- Older adults have higher rates of hospitalization than younger adults
- Rates of vaccination among older adults who have received a bivalent COVID-19 vaccine booster dose **remain low**
- The Work Group emphasized the importance of older adults being **up to date** on current recommendations, including receiving a bivalent booster
- The Work Group discussed more frequent COVID-19 vaccine doses for older adults, and at this time felt the data were **insufficient** to determine a conclusion
- Recommendations can be updated based on data in older adults including:
  - Hospitalization rates of older adults who have received a bivalent booster
  - Bivalent VE and patterns of waning for older adults
  - SARS-CoV-2 virus evolution and possibility of future immune escape variants
Should people with immunocompromise be recommended for >1 vaccine annually?

- Numerous studies have demonstrated that mRNA COVID-19 vaccine effectiveness among immunocompromised persons is lower than that of immunocompetent persons, including within the period of Omicron predominance.
- This has been demonstrated across a range of immunocompromising conditions, and is particularly notable for organ or stem cell transplant recipients.
- Among people with immunocompromise, recommendations prior to the bivalent booster allowed for up to 5 monovalent doses of COVID-19 vaccine.
- Vaccine effectiveness studies are not yet sufficiently powered to evaluate effectiveness of the bivalent booster among people with immunocompromise.
Should people with immunocompromise be recommended for >1 vaccine annually?

- VE among immunocompromised persons is **lower** than that of immunocompetent persons at comparable time points after dose 2 and dose 3
- VE wanes in both immunocompetent and immunocompromised persons


<table>
<thead>
<tr>
<th>Vaccination status</th>
<th>No likely immunocompromising condition</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No</td>
<td>Covid-like illness controls (Col %)</td>
</tr>
<tr>
<td>Unvaccinated</td>
<td>25215</td>
<td>17350 (29.3)</td>
</tr>
<tr>
<td>Partially vaccinated</td>
<td>2583</td>
<td>2202 (3.7)</td>
</tr>
<tr>
<td>2-dose vaccinated &lt; 2 months</td>
<td>324</td>
<td>280 (5.0)</td>
</tr>
<tr>
<td>2-dose vaccinated 2 to &lt;4 months</td>
<td>869</td>
<td>724 (1.2)</td>
</tr>
<tr>
<td>2-dose vaccinated 4 to &lt;6 months</td>
<td>1315</td>
<td>1063 (1.8)</td>
</tr>
<tr>
<td>2-dose vaccinated 6 to &lt;8 months</td>
<td>2012</td>
<td>1555 (2.6)</td>
</tr>
<tr>
<td>2-dose vaccinated 8 to &lt;10 months</td>
<td>4378</td>
<td>3179 (5.4)</td>
</tr>
<tr>
<td>2-dose vaccinated 10 to &lt;12 months</td>
<td>4771</td>
<td>3849 (6.5)</td>
</tr>
<tr>
<td>2-dose vaccinated 12 to &lt;14 months</td>
<td>3076</td>
<td>2812 (4.8)</td>
</tr>
<tr>
<td>2-dose vaccinated ≥14 months</td>
<td>1654</td>
<td>1430 (2.4)</td>
</tr>
<tr>
<td>3-dose vaccinated &lt;2 months</td>
<td>4164</td>
<td>3837 (6.5)</td>
</tr>
<tr>
<td>3-dose vaccinated 2 to &lt;4 months</td>
<td>9089</td>
<td>8499 (14.4)</td>
</tr>
<tr>
<td>3-dose vaccinated 4 to &lt;6 months</td>
<td>8644</td>
<td>8130 (13.7)</td>
</tr>
<tr>
<td>3-dose vaccinated 6 to &lt;8 months</td>
<td>4187</td>
<td>3742 (6.3)</td>
</tr>
<tr>
<td>3-dose vaccinated ≥8 months</td>
<td>624</td>
<td>530 (0.9)</td>
</tr>
</tbody>
</table>

**Figure:** Ferdinands J M, Rao S, Dixon B E, Mitchell P K, DeSilva M B, Irving S A et al. Waning of vaccine effectiveness against moderate and severe covid-19 among adults in the US from the VISION network: test negative, case-control study BMJ 2022
Should people with immunocompromise be recommended for >1 vaccine annually?

Summary

- Immunocompromised adults can have less robust immune response to COVID-19 vaccines
- Not currently any authorized prophylactic monoclonal antibody products for populations at highest risk of COVID-19
- The Work Group discussed more frequent COVID-19 vaccine doses for people with immunocompromise, and at this time felt the data were insufficient to determine a conclusion
- The Work Group acknowledged this population may continue to be more vulnerable to severe COVID-19 and likely needs flexibility with COVID-19 vaccine recommendations
Considerations for future planning
COVID-19 vaccines

COVID-19 vaccines: Where we are now

COVID-19 vaccines: Where we are going

Goal: Simple recommendations
Considerations for future planning

COVID-19 vaccines

- COVID-19 vaccines continue to be the **most effective tool** we have to prevent **serious illness, hospitalization and death from COVID-19**

- **Goal** of COVID-19 vaccine program continues to be **prevention of severe disease**
  - Prevention of post-COVID conditions, increased confidence in social interactions important as well

- Benefits of additional COVID-19 vaccine booster doses vary by **age, time since last dose**, and COVID-19 **incidence**

- A simplified, annual recommendation could help reduce vaccine and message fatigue

- A COVID-19 vaccine framework that is similar to a well understood influenza vaccine framework could be easy for COVID-19 vaccine providers to implement, and for the public to understand
Work Group interpretation
Considerations for future planning

- **Simple recommendations** are easier to communicate, which may improve uptake
  - The Work Group was very supportive of simplified recommendations and planning for future COVID-19 vaccines, which could include updated COVID-19 vaccines

- **Uncertainties remain** for ideal timing and populations for future boosters, especially if new immune escape variants develop

- The Work Group was **supportive** of a fall/annual COVID-19 vaccine program, with flexibility to adjust based on new data, especially for populations at high risk

- The Work Group will continue to **review data** to inform future deliberations:
  - Vaccine effectiveness of bivalent COVID-19 vaccines over time
  - Safety data of bivalent COVID-19 vaccines
  - Cost effectiveness analyses
  - COVID-19 epidemiology, including hospitalization rates among vaccinated and boosted persons
  - SARS-CoV-2 genomic surveillance and virus evolution
  - Data from vaccine manufacturers
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Question for ACIP

- Discussions about future COVID-19 vaccine recommendations are pre-decisional and intended to inform planning and additional analyses.

- What are ACIP's thoughts on a simplified framework for future COVID-19 vaccine recommendations?
  - What does ACIP think about children who may still need a primary series?
  - What does ACIP think about future recommendations for older adults?
  - What does ACIP think about future recommendations for people with immunocompromising conditions?
For more information, contact CDC
1-800-CDC-INFO (232-4636)

Thank you

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.