Immunization in Primary Care: An Update

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Affiliations

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Learning Objectives

- At the conclusion of this session, participants should be able to:
  - Identify highlights on vaccinations
    - Updates in 2023 or thereafter
    - Other recent updates – highlights
  - Apply new updates on the COVID-19 vaccine
  - Apply new updates on other vaccinations in children, adolescents, and adults
  - Apply other recent vaccine updates
  - Approach patients with vaccination hesitancy
  - Collaborate with teams to successfully vaccinate many patients

Approach

CDC (Centers for Disease Control and Prevention) / ACIP (Advisory Committee on Immunization Practices)

2023 updates – Primary Focus

- Children/Adolescents and Adults

Other updates – A list of vaccines to review at your own pace

Briefly cover Hep B, Mpox, and Tdap

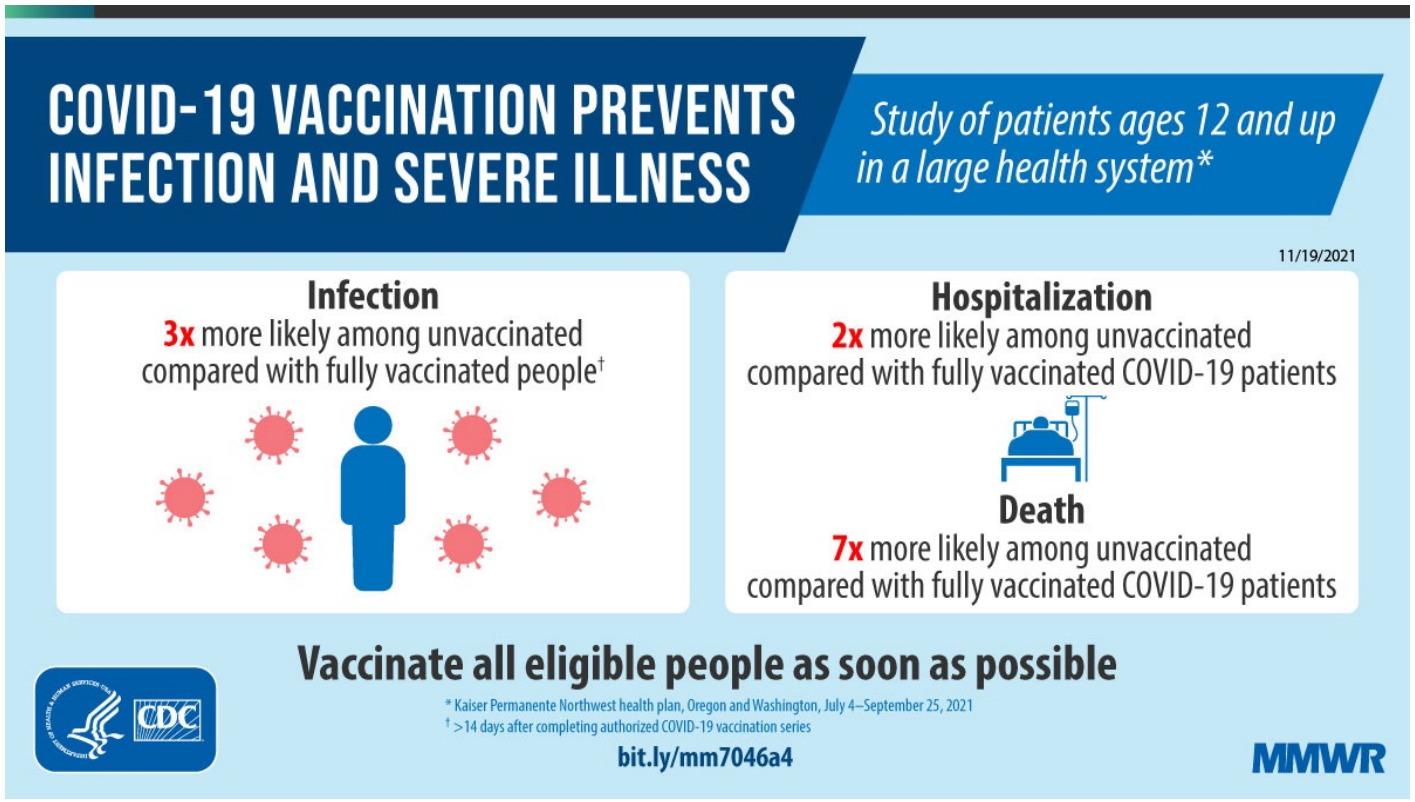
Vaccine Updates – 2023

- Primary Focus
  - COVID-19 – 2023
  - Influenza - 2023
  - Pneumococcal – 2022/2023
  - Polio – 2023
  - Respiratory Syncytial Virus (RSV) – 2023
  - Tick-borne Encephalitis (TBE) – 2023

Other Updates

- Review the following IZ updates on your own
  - Cholera – 2022
  - Ebola - 2022
  - Hepatitis B - 2022
  - Measles, Mumps, and Rubella (MMR) – 2022
  - Rabies – 2022
  - Smallpox and Mpox – 2022
  - Zoster – 2022
- Helpful to know
  - DTaP/Tdap/Td – 2023/2024

COVID-19


COVID-19 VACCINATION PREVENTS INFECTION AND SEVERE ILLNESS
Study of patients ages 12 and up in a large health system*
11/19/2021
Infection
3x more likely among unvaccinated compared with fully vaccinated people†
Hospitalization
2x more likely among unvaccinated compared with fully vaccinated COVID-19 patients
Death
7x more likely among unvaccinated compared with fully vaccinated COVID-19 patients
Vaccinate all eligible people as soon as possible
* Kaiser Permanente Northwest health plan, Oregon and Washington, July 4–September 25, 2021
† >14 days after completing authorized COVID-19 vaccination series
bit.ly/mm7046a4
CDC
MMWR

Top

TABLE 1. Recommended COVID-19 vaccination schedule for persons aged 6 months–4 years who are not moderately or severely immunocompromised,* by COVID-19 vaccination history — United States, September 2023

Return

Previous COVID-19 vaccination history (before updated mRNA vaccine)†	Updated mRNA vaccine	No. of updated mRNA vaccine doses indicated	Interval between doses
Unvaccinated	Moderna	2	Dose 1 and dose 2: 4–8 wks
	Pfizer-BioNTech	3	Dose 1 and dose 2: 3–8 wks Dose 2 and dose 3: ≥8 wks
Received Moderna vaccine			
1 dose any Moderna	Moderna	1	4–8 wks after last dose
≥2 doses any Moderna	Moderna	1	≥8 wks after last dose
Received Pfizer-BioNTech vaccine			
1 dose any Pfizer-BioNTech	Pfizer-BioNTech	2	Dose 1: 3–8 wks after last dose Dose 1 and dose 2: ≥8 wks
2 doses any Pfizer-BioNTech	Pfizer-BioNTech	1	≥8 wks after last dose
≥3 doses any Pfizer-BioNTech	Pfizer-BioNTech	1	≥8 wks after last dose

* Additional clinical considerations, including detailed schedules and tables by age and vaccination history for those who are and are not moderately or severely immunocompromised, are available. https://www.cdc.gov/vaccines/covid-19/clinical-considerations/covid-19-vaccines-us.html

† https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#not-immunocompromised

Top

TABLE 2. Recommended COVID-19 vaccination schedule for persons aged ≥5 years who are not moderately or severely immunocompromised,* by COVID-19 vaccination history — United States, September 2023

COVID-19 vaccination history before updated vaccine†	Updated vaccine	No. of updated doses indicated	Interval between doses
Unvaccinated	Moderna	1	—
	Pfizer-BioNTech	1	—
	Novavax (aged ≥12 yrs only)	2	Dose 1 and dose 2: 3–8 wks
Receipt of ≥1 COVID-19 vaccine dose, including Moderna, Pfizer-BioNTech, Novavax (aged ≥12 yrs only), or Janssen (Johnson & Johnson) (aged ≥18 yrs only)	Moderna	1	≥8 wks after last dose
	Pfizer-BioNTech	1	≥8 wks after last dose
	Novavax (aged ≥12 yrs only)	1	≥8 wks after last dose

* Additional clinical considerations, including detailed schedules and tables by age and vaccination history for those who are and are not moderately or severely immunocompromised, are available. https://www.cdc.gov/vaccines/covid-19/clinical-considerations/covid-19-vaccines-us.html

† https://www.cdc.gov/vaccines/covid-19/clinical-considerations/interim-considerations-us.html#not-immunocompromised

Top

COVID-19 Vaccine – Highlights

Bivalent mRNA COVID-19 vaccines - variants these vaccines were designed to protect against are no longer circulating widely.

ACIP recommended vaccination with updated COVID-19 vaccines for all persons aged ≥6 months.

The FDA approved and authorized updated 2023–2024 Formula monovalent XBB.1.5 component– target current variants more closely, specifically Omicron variant XBB.1.5.

The updated COVID-19 vaccines are meant to broaden vaccine-induced immunity and provide protection against the currently circulating SARS-CoV-2 XBB-sublineage variants including against severe COVID-19–associated illness and death.


FLU VACCINE:
We all have a role in protecting each other
#FIGHT FLU
CDC

Influenza

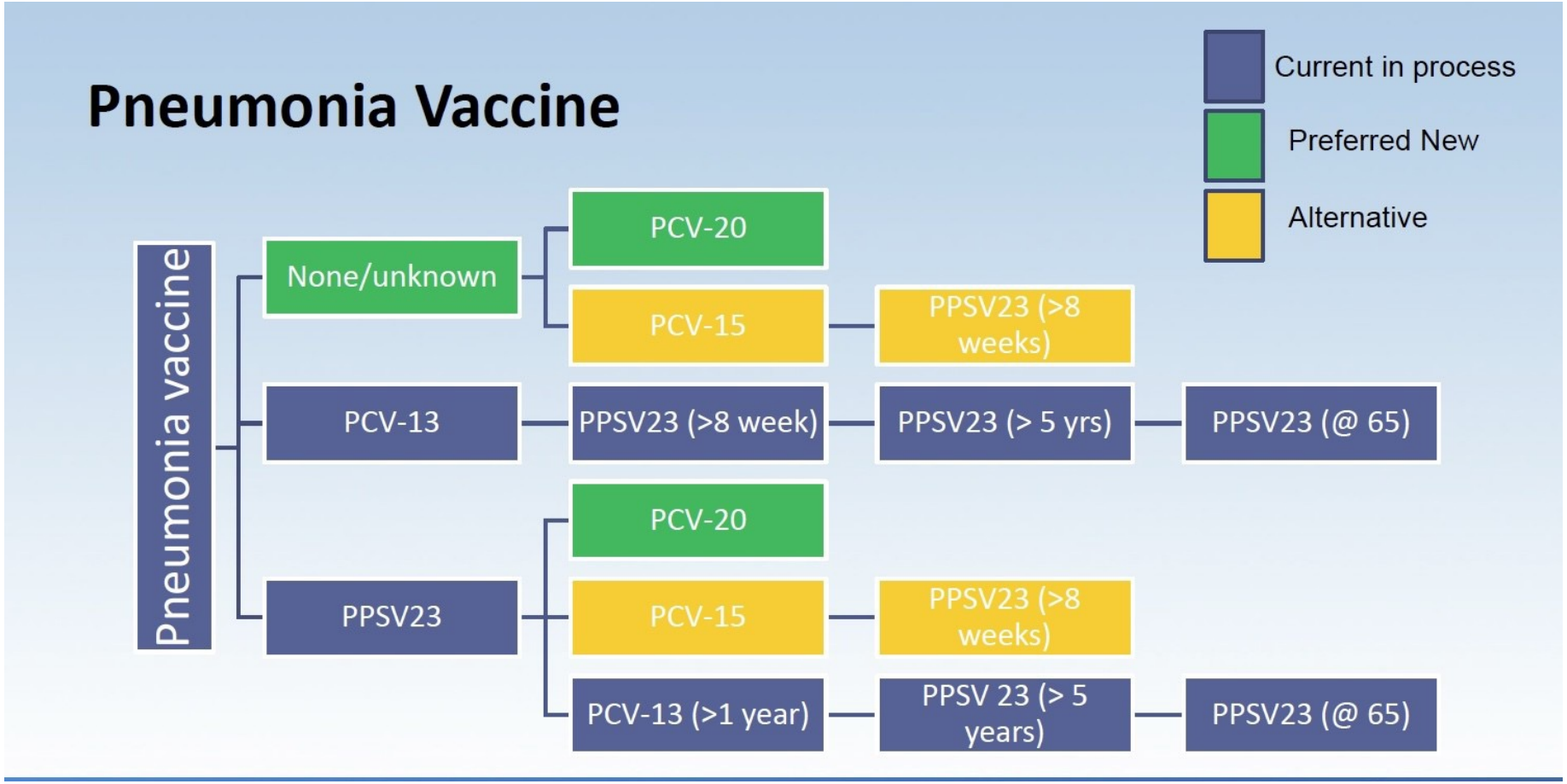
Influenza Vaccine – Highlights

- PERSONS WITH EGG ALLERGY
  - All ages ≥6 months with egg allergy should receive influenza vaccine.
  - Any influenza vaccine (egg based or non-egg based) can be used.
  - Egg allergy necessitates **no additional safety measures** for influenza vaccination beyond those recommended for any recipient of any vaccine, regardless of severity of previous reaction to egg.
  - Severe and life-threatening reactions to vaccines can occur with any vaccine and in any vaccine recipient, regardless of allergy history.
  - All vaccines should be administered in settings in which personnel and equipment needed for rapid recognition and treatment of acute hypersensitivity reactions are available.


MMWR
New from CDC:
Updated clinical guidance
for adult pneumococcal
vaccine recommendations
Read the latest
MMWR to learn more
CDC

PCV

PCV Vaccine – Helpful Diagram



Reference: https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-opportunistic-infections/immunizations

Pneumonia Vaccine - Highlights

- 20-valent pneumococcal conjugate vaccine (PCV 20, Prevnar 20) **- preferred**
  - Give one time if 19-64 with any underlying immunocompromising condition
  - Only need to give once.
  - Do not need to give at age 65 (if given at an earlier age).
- 15-valent pneumococcal conjugate vaccine (PCV 15, Prevnar 15) **- alternative)**
  - PCV-15 can be given: however this does not cover all the serotypes.
  - So give PPSV23 >8 weeks after PCV 15 (this is different than what is recommended by CDC for immunocompetent which is to give at 1 year)
  - No additional vaccination.

TABLE 2. Pneumococcal vaccine schedules for adults aged ≥65 years, by underlying conditions — Advisory Committee on Immunization Practices, United States, 2023

	Any or no underlying condition	No specified immunocompromising condition,* CSF leak, or cochlear implant	Specified immunocompromising condition,* CSF leak, or cochlear implant
Vaccine received previously at any age	**Schedule option A (PCV20 available)**	**Schedule option B (PCV15 and PPSV23 available)**	**Schedule option B (PCV15 and PPSV23 available)**
None/unknown† or PCV7 only§	Administer a single dose of PCV20	Administer a single dose of PCV15, then after a ≥1 year interval since the PCV15 dose, administer a single dose of PPSV23	Administer a single dose of PCV15, then after ≥8 weeks since the PCV15 dose, administer a single dose of PPSV23
PPSV23 only§	Administer a single dose of PCV20 after a ≥1 year interval since the last PPSV23 dose	Administer a single dose of PCV15 after a ≥1 year interval since the last PPSV23 dose	Administer a single dose of PCV15 after a ≥1 year interval since the last PPSV23 dose
PCV13 only	Administer a single dose of PCV20 after a ≥1 year interval since the last PCV13 dose¶	Administer a single dose of PPSV23 after a ≥1 year interval since the last PCV13 dose**	Administer a single dose of PPSV23 after ≥8 weeks since the last PCV13 dose**
Both PCV13 and PPSV23 (any order of receipt) but has not yet received a dose of PPSV23 at age ≥65 years	Administer a single dose of PCV20 after a ≥5 year interval since the last PCV13 or PPSV23 dose¶	Administer a single dose of PPSV23 after a ≥1 year interval since the last PCV13 dose and a ≥5 year interval since the last PPSV23 dose**	Administer a single dose of PPSV23 after ≥8 weeks since the last PCV13 dose and ≥5 years since the last PPSV23 dose**
Both PCV13 and PPSV23 (any order), and the PPSV23 was administered at age ≥65 years	Together, with the patient, vaccine providers may choose to administer a single dose of PCV20 to adults aged ≥65 years who already have received PCV13 (but not PCV15 or PCV20) at any age and PPSV23 at age ≥65 years. The interval should be ≥5 years since the last PCV13 or PPSV23 dose.¶,††	N/A	N/A

TABLE 3. Pneumococcal vaccine schedules for adults aged 19–64 years with specified immunocompromising conditions* — Advisory Committee on Immunization Practices, United States, 2023

Vaccine received previously at any age	Schedule option A (PCV20 available)	Schedule option B (PCV15 and PPSV23 available)
None/unknown† or PCV7 only§ at any age	Administer a single dose of PCV20	Administer a single dose of PCV15, then after a ≥8 week interval since the PCV15 dose, administer a single dose of PPSV23
PPSV23 only§	Administer a single dose of PCV20 after a ≥1 year interval since the last PPSV23 dose	Administer a single dose of PCV15 after a ≥1 year interval since the last PPSV23 dose
PCV13 only	Administer a single dose of PCV20 after a ≥1 year interval since the last PCV13 dose¶	Administer a single dose of PPSV23 after a ≥8 week interval since the last PCV13 dose. Administer a second PPSV23 dose after a ≥5 year interval since the last PPSV23 dose. Review the pneumococcal vaccine recommendations again when the patient turns age 65 years.**
PCV13 and 1 dose of PPSV23 (any order of receipt)	Administer a single dose of PCV20 after a ≥5 year interval since the last PCV13 or PPSV23 dose¶	Administer a single dose of PPSV23 after a ≥8 week interval since the last PCV13 dose and a ≥5 year interval since the last PPSV23 dose. Review the pneumococcal vaccine recommendations again when the patient turns age 65 years.**
PCV13 and 2 doses of PPSV23 (any order of receipt)	Administer a single dose of PCV20 after a ≥5 year interval since the last PCV13 or PPSV23 dose¶	Review the pneumococcal vaccine recommendations again when the patient turns age 65 years**

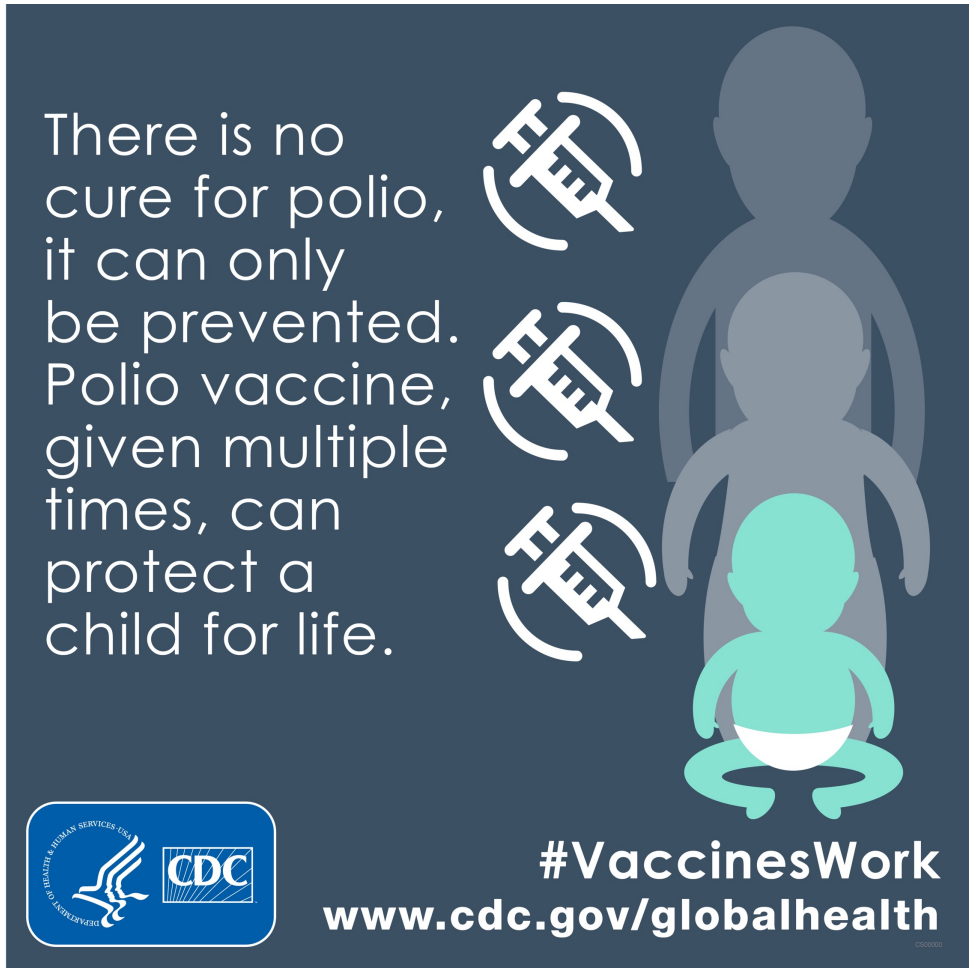
TABLE 5. Pneumococcal vaccine schedules for adults aged 19–64 years with a chronic medical condition* — Advisory Committee on Immunization Practices, United States, 2023

Vaccine received previously	Schedule option A (PCV20 available)	Schedule option B (PCV15 and PPSV23 available)
None† or PCV7 only§ at any age	Administer a single dose of PCV20	Administer a single dose of PCV15, then after a ≥1 year interval since the last dose, administer a single dose of PPSV23
PPSV23 only§	Administer a single dose of PCV20 after a ≥1 year interval since the last PPSV23 dose	Administer a single dose of PCV15 after a ≥1 year interval since the last PPSV23 dose
PCV13 only§,¶	After a ≥1 year interval since the last dose, administer a single dose of PCV20	Administer a single dose of PPSV23 after a ≥1 year interval since the last PCV13 dose. Review the pneumococcal vaccine recommendations again when the patient turns age 65 years.
PCV13 and PPSV23§,¶	No vaccines are recommended at this time. Review the pneumococcal vaccine recommendations again when the patient turns age 65 years.	

Medical indication group	Specific underlying medical condition	Age group, yrs	
		19–64	≥65
None	None	None	1 dose of PCV20 alone, or 1 dose of PCV15 followed by a dose of PPSV23 ≥1 year later*
Underlying medical conditions or other risk factors	Alcoholism Chronic heart disease† Chronic liver disease Chronic lung disease§ Chronic renal failure¶ Cigarette smoking Cochlear implant Congenital or acquired asplenia¶ Congenital or acquired immunodeficiencies¶,** CSF leak Diabetes mellitus Generalized malignancy¶ HIV infection Hodgkin disease¶ Iatrogenic immunosuppression¶,†† Leukemia¶ Lymphoma¶ Multiple myeloma¶ Nephrotic syndrome¶ Sickle cell disease or other hemoglobinopathies¶ Solid organ transplant¶	1 dose of PCV20 alone or 1 dose of PCV15 followed by a dose of PPSV23 ≥1 year later*	1 dose of PCV20 alone or 1 dose of PCV15 followed by a dose of PPSV23 ≥1 year later*

Pneumonia Vaccine Pediatrics Highlights

- If only PCV13 is available when the child is scheduled to receive a PCV, PCV13 may be given as previously recommended.
- If a child started the PCV series with PCV13, the child may complete the series with PCV15 or PCV20 without giving additional doses; the PCV series does not need to be restarted.
- For healthy children aged 24-59 months who completed recommended PCV vaccination series with PCV13 (i.e., 4 doses of PCV13 or another age-appropriate PCV13 schedule), a supplemental dose of PCV15 or PCV20 is not indicated.
- For children aged 6–18 years with a risk condition who have received PCV13 only at or after age 6 years, either a dose of PCV20 or ≥1 dose of PPSV23 is recommended at least 8 weeks after the last PCV13 dose.
- When PPSV23 is used instead of PCV20 for children aged 6–18 years with an immunocompromising condition, either PCV20 or a second PPSV23 dose is recommended ≥5 years after the first PPSV23 dose.


There is no cure for polio, it can only be prevented. Polio vaccine, given multiple times, can protect a child for life.
CDC
#VaccinesWork
www.cdc.gov/globalhealth

Polio

Polio Vaccine - Highlights

- IPV was recommended for U.S. adults known to be at increased risk for poliovirus exposure – previously known.
- There is no need to restart the series if the interval between doses exceeds the recommended interval.
- Adults aged ≥18 years who are known or suspected to be unvaccinated or incompletely vaccinated against polio should complete a primary polio vaccination series with IPV.
- Fully vaccinated adults at increased risk for poliovirus exposure may receive a single lifetime booster dose of IPV.

Polio - Dosing Schedule

Adults requiring a primary polio vaccination series should receive 2 doses of IPV administered at an interval of 4–8 weeks; a third dose should be administered 6–12 months after the second dose.

There is no need to restart the series if the interval between doses exceeds the recommended interval.

If 3 doses of IPV cannot be administered within the recommended interval before protection is needed (e.g., before travel to a country with endemic polio), an accelerated schedule is recommended based on the amount of time available.

Polio - Accelerated Schedule

When there is not enough time to give 3 doses of IPV, an accelerated schedule can be used

If protection is needed in ≥8 weeks, 3 doses of IPV can be administered at least 4 weeks apart (e.g., at weeks 0, 4, and 8).

If protection is needed in ≥4 but <8 weeks, 2 doses of IPV should be administered at least 4 weeks apart (e.g., at weeks 0 and 4).

If protection is needed in fewer than 4 weeks, a single dose of IPV should be administered.

If the accelerated schedule is incomplete, the remaining doses should be given ASAP (e.g., in the visited country, or upon returning home) to complete the primary series - third dose should be given at least 6–12 months after the second dose if that is possible.


New *MMWR* on
ACIP's respiratory
syncytial virus
(RSV) vaccine
recommendations
Stay up to date on
recommendations for
adults 60 years and older
CDC

RSV

BOX. Underlying medical conditions and other factors associated with increased risk for severe RSV disease

Chronic underlying medical conditions associated with increased risk

- Lung disease (such as chronic obstructive pulmonary disease and asthma)
- Cardiovascular diseases (such as congestive heart failure and coronary artery disease)
- Moderate or severe immune compromise*
- Diabetes mellitus
- Neurologic or neuromuscular conditions
- Kidney disorders
- Liver disorders
- Hematologic disorders
- Other underlying conditions that a health care provider determines might increase the risk for severe respiratory disease

Other factors associated with increased risk

- Frailty†
- Advanced age§
- Residence in a nursing home or other long-term care facility
- Other underlying factors that a health care provider determines might increase the risk for severe respiratory disease

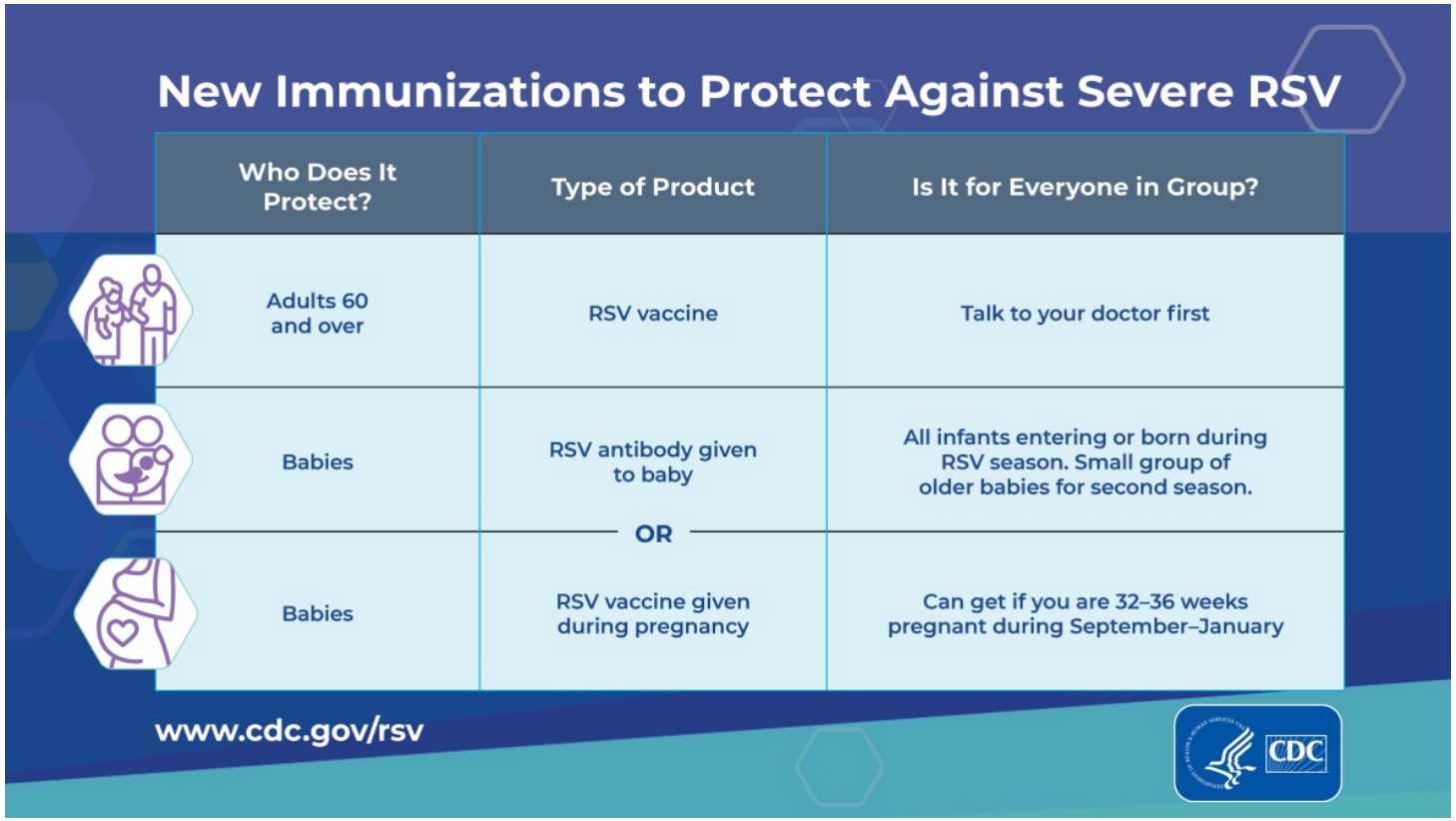
Clinical pearl- The SHARE Approach: A Model for Shared Decision Making

Reference: https://www.ahrq.gov

RSV Vaccine - Highlights

- RSV causes substantial morbidity and mortality in older adults. FDA approved the first two vaccines for prevention of RSV lower respiratory tract disease (LRTD) for use in adults aged ≥60 years.
- Both vaccine products demonstrated moderate to high efficacy in preventing symptomatic RSV-associated LRTD among adults aged ≥60 years.
- ACIP recommended that persons aged ≥60 years may receive a single dose of RSV vaccine, using shared clinical decision-making.

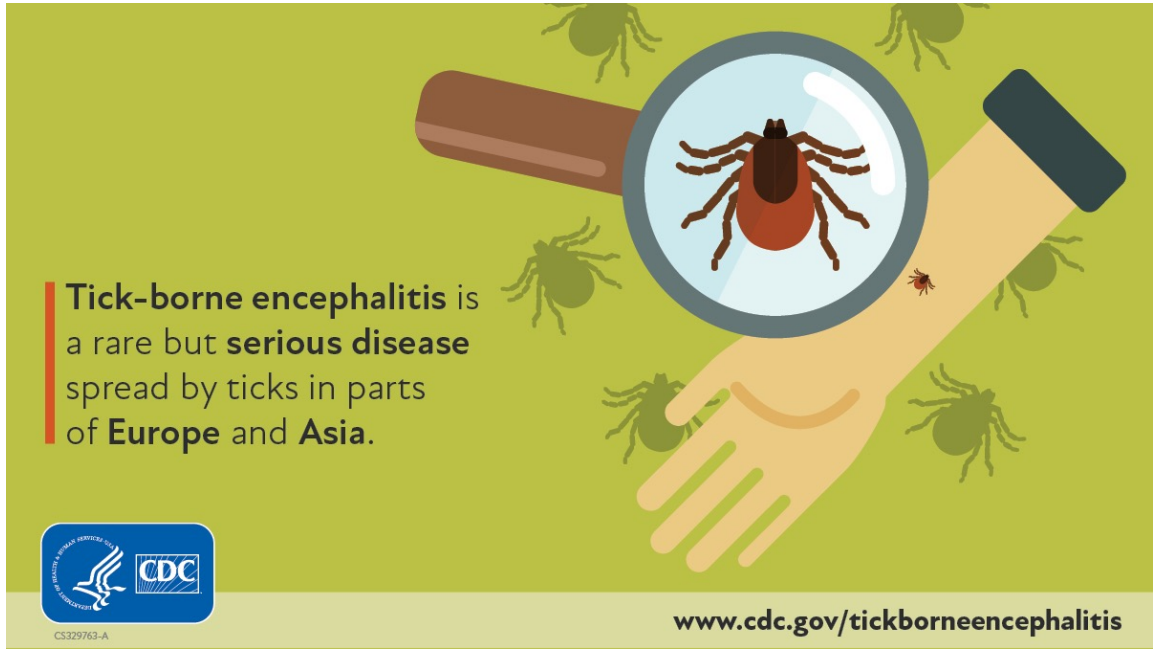
RSV Vaccine – Highlights



Tick-borne encephalitis (TBE)

Tick-borne encephalitis (TBE)

- TBE virus is focally endemic in parts of Europe and Asia.
- TBE virus can cause acute neurologic disease, which usually results in hospitalization, often permanent neurologic or cognitive sequelae, and sometimes death.



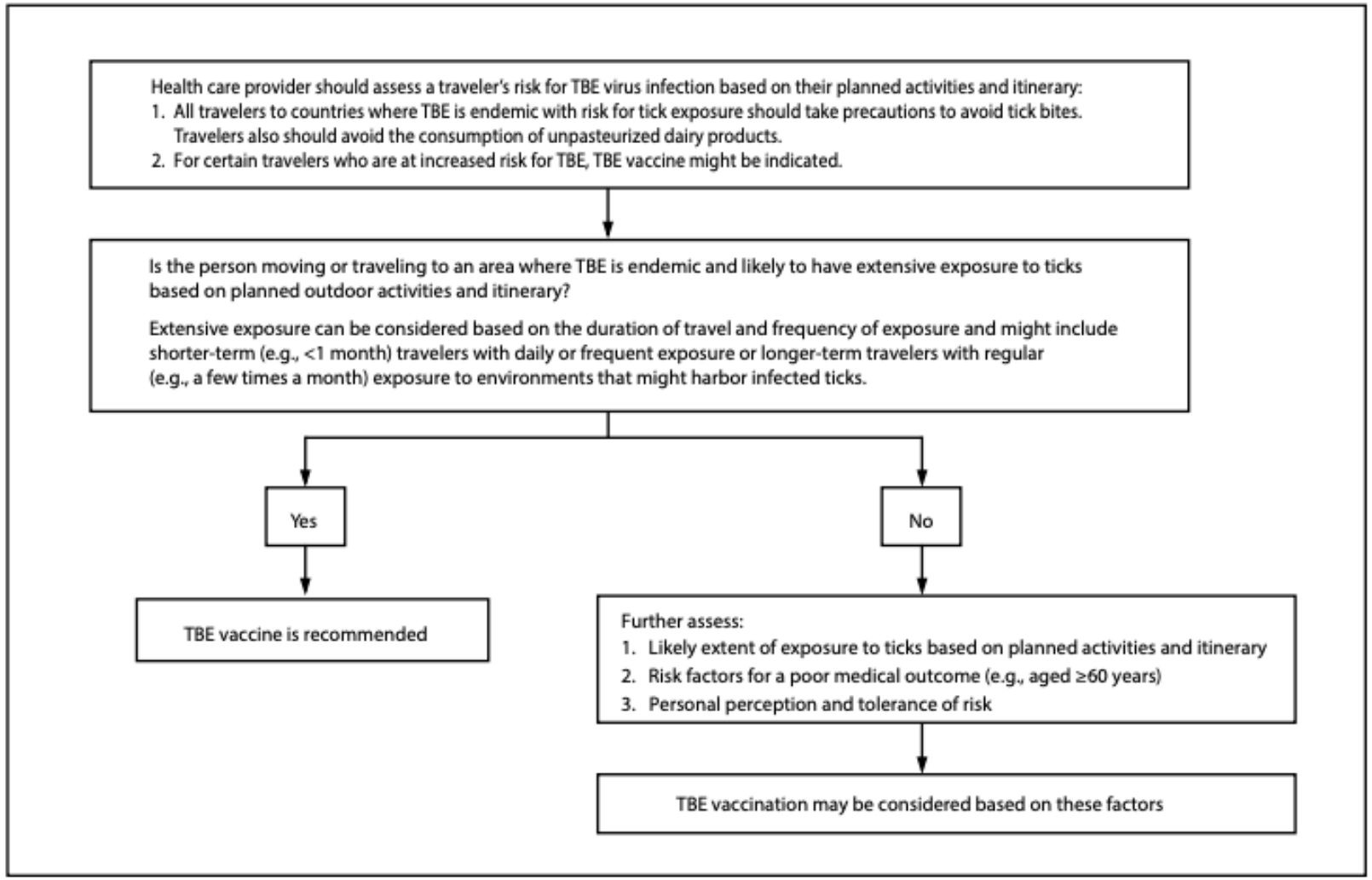
TBE Vaccine-Highlights

Final ACIP Recommendation

- Two types of recommendations were approved.
  - TBE vaccine is **recommended** for persons who are moving or traveling to an area where TBE is endemic area and will have extensive exposure to ticks because of their planned outdoor activities and itinerary.

  - TBE vaccine **may be considered** for persons traveling or moving to an area where TBE is endemic who might engage in outdoor activities in areas where ticks are likely to be found. The decision to vaccinate should be based on an assessment of their planned activities and itinerary, risk factors for a poor medical outcome, and personal perception and tolerance of risk.

FIGURE. Decision-making for recommending tick-borne encephalitis vaccination for U.S. travelers to areas where the disease is endemic



Abbreviation: TBE = tick-borne encephalitis.

Tick-borne encephalitis vaccination schedule

	PRIMARY VACCINATION SCHEDULE			
	DOSE 1	DOSE 2	DOSE 3	BOOSTER
ADULTS (≥ 16 YEARS)	Day 0	14 days–3 months*	5–12 months*	A fourth dose may be given at least 3 years after completion of the primary vaccination schedule if ongoing exposure or re-exposure to tick-borne encephalitis is expected
CHILDREN (1–15 YEARS)	Day 0	1–3 months*	5–12 months*	

*After the previous vaccination

Where Can I Get Vaccinated?

- The public cannot order the TBE vaccine directly. If you would like to receive the TBE vaccine, you should contact your primary care provider or a travel medicine clinic in your area.

Other Updates - Quick Review

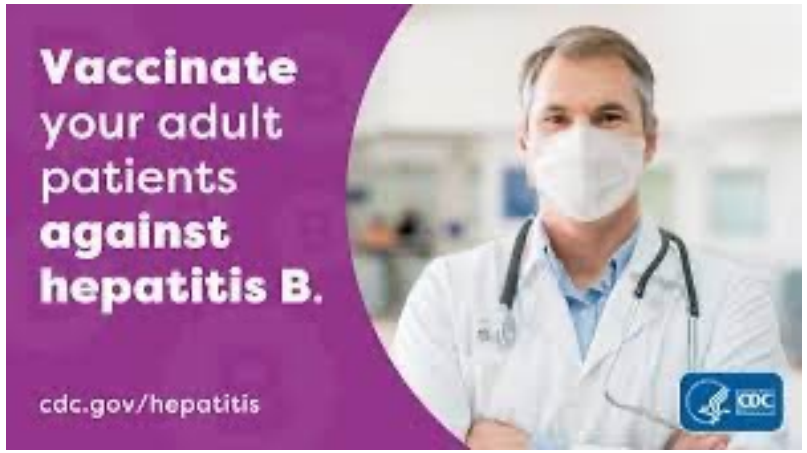
- Cholera – 2022
- Ebola - 2022
- Hepatitis B - 2022
- MMR – 2022
- Rabies – 2022
- Smallpox and Mpox – 2022
- Zoster – 2022

Should clinicians test people for immunity to hepatitis B before being vaccinated?

Lack of access to serologic testing should not be a barrier to vaccination of susceptible people, especially in populations that are difficult to reach or have limited access to healthcare. Testing is not a requirement for vaccination, and in settings where testing is not feasible or is refused by the patient, the clinician should recommend the person proceed with vaccination.

Takeaway

It is not harmful to vaccinate people who are immune to HBV infection because of current or previous infection or vaccination, nor does it increase the risk for adverse events.



Approach

All adults aged 19–59 years should receive HepB vaccines.

Risk factor–based approach is not necessary.

Doing titer is not necessary.

You give the vaccine.

Hepatitis B - Review

A 50-year-old woman reports being current with all immunizations but uncertain about the hepatitis B vaccine. She is interested in receiving it if deemed necessary. She doesn't want to get the vaccine if she has the current immunity. How would you approach this situation?

- Complete serologic testing
  - HBsAg
  - anti-HBs
  - anti-HBc
- Check the results
- Give Hep B vaccine PRN

Smallpox and Mpox

Mpox Vaccine – Highlights

Modified Vaccinia Ankara-Bavarian Nordic (Jynneos) [MVA-BN] is a replication deficient pox virus strain given subcutaneously 2 dose series 28 days apart.

In immunocompetent persons it takes 2 weeks after completion of series (6 weeks) to develop protective antibodies.

Helpful to know

DTaP/Tdap/Td – 2023/2024

Constrained U.S. Td supply, 2024

- Historically, two tetanus and diphtheria (Td) vaccine products have been available for use in the United States:
  - TdVax™, manufactured by MassBiologics
  - Tenivac®, manufactured by Sanofi
- MassBiologics has **discontinued production of TdVax™**, which is exclusively distributed by Grifols. Sanofi is taking steps to augment their available U.S. supply of Tenivac®. Despite these efforts, it's anticipated that the **supply of Td** vaccine in the U.S. market will be **constrained during 2024**.
- Temporary ordering controls are in place in the public and private sectors to help manage the gap in supply. Diphtheria, tetanus, and acellular pertussis (Tdap) vaccines are available without supply constraints at this time.

Guidance for vaccination providers

The limited supply of Td vaccine needs to be preserved for those with a contraindication to receiving pertussis-containing vaccines. To assist vaccination providers, CDC has developed the following guidance:

Transition to use of Tdap vaccine in lieu of Td vaccine whenever possible **while Td vaccine supplies are constrained.**

Tdap vaccine **is an acceptable alternative** to Td vaccine, including when a tetanus booster is indicated for wound management.

Tdap vaccine **isn't an acceptable alternative** only when a person has a specific contraindication to pertussis-containing vaccines, which is very rare.

This guidance will remain in place until the period of temporary ordering controls for Td vaccine ends.

Approach to patients with vaccination hesitancy

Approach

Be Patient With Your Patient.

When you affirm what the patient says, it puts them at ease and provides a smoother road to eventually getting them to say "yes."

Always Acknowledge a Concern.

Fear of side effects is great among some patients, even if the risks are low. Patients may be hesitant because they're afraid they'll become one of the "two or three in a million" who suffer extremely rare side effects from the vaccine.

We should acknowledge their concern is valid. Never be dismissive. Ask the patients how they feel about the vaccine, listen to their responses, and let them know "I hear you. This is a new mRNA vaccine…you have concern about that.

Make a Strong Recommendation.

We make strong treatment recommendations such conditions as DM or HTN, but when it comes to vaccines, we are often rather not making it strong.

Reference: William Schaffner, MD, Five Strategies
https://www.medscape.com/viewarticle/getting-reluctant-patients-yes-covid-vaccination-2024a1000560

Approach

Appeal to Patients' Hearts, Not Their Minds.

Remind that COVID vaccine has become "the social norm," suggesting virtually everyone you know have received it and had no problem.

Once questions have been answered about whether the vaccine works and its various side effects, you could remind the patient, "You know, everyone in my office is getting the vaccine, and we're trying to provide this protection to every patient.

Make it Personal.

Everybody is unique, but with trust, patience, and awareness of the patient's feelings, doctors have a better shot at finding common ground with their patients and convincing them the vaccine is in their best interest.

Reference: William Schaffner, MD, Five Strategies
https://www.medscape.com/viewarticle/getting-reluctant-patients-yes-covid-vaccination-2024a1000560

Collaborate with teams to successfully vaccinate many patients

Make it a Team Approach

Develop	Defer	Help	Allow
Develop a standing delegation order for nursing/or pharmacy team members for key routine vaccinations to make sure they are completed	Only defer vaccination which require shared decision making to providers	All team members (nurses, MA, pharmacist, case managers) can help increase vaccination rates	Allow routine serologies, post-vaccination serology testing to be in the order set

Questions?

References:

1. Centers for Disease Control and Prevention. (n.d.). Immunization schedules. Retrieved from https://www.cdc.gov/vaccines/schedules/index.html
2. Centers for Disease Control and Prevention. (n.d.). Advisory Committee on Immunization Practices (ACIP). Retrieved from https://www.cdc.gov/vaccines/acip/index.html
3. Schaffner, W. (n.d.). Five strategies for getting reluctant patients to say yes to COVID vaccination. Medscape. Retrieved from https://www.medscape.com/viewarticle/getting-reluctant-patients-yes-covid-vaccination-2024a1000560
4. Kara, H. (2015, July 7). Ten top tips for successful collaboration. Retrieved from https://helenkara.com/2015/07/07/ten-top-tips-for-successful-collaboration/ (picture on slide 69)
5. HIV/AIDS Bureau. (n.d.). Immunizations. Retrieved from https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-opportunistic-infections/immunizations
6. Jain, M. K. (2023). HIV primary care guidance: An update. Presented at the HIV 2023: A State-of-the-Science Conference for Frontline Health Professionals.