



Recommendations on Use of New Pneumococcal Conjugate Vaccines for U.S. Adults

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National Adult and Influenza Immunization Summit Call

February 17, 2022

On October 20, 2021, the ACIP recommended use of new pneumococcal conjugate vaccines for adults.

Use of 15-Valent Pneumococcal Conjugate Vaccine and 20-Valent Pneumococcal Conjugate Vaccine Among U.S. Adults: Updated Recommendations of the Advisory Committee on Immunization Practices — United States, 2022

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Two pneumococcal vaccines were licensed for use in U.S. adults before 2021.

| | 1 | 3 | 4 | 5 | 6A | 6B | 7F | 9V | 14 | 18 C | 19 A | 19 F | 23 F | 22 F | 33 F | 8 | 10 A | 11 A | 12 F | 15 B | 2 | 9N | 17 F | 20 | |
|-------|---|---|---|---|----|----|----|----|----|---------|---------|---------|---------|---------|---------|---|---------|---------|---------|---------|---|----|---------|----|--|
| PCV13 | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| PPSV23 | | | | | | | | | | | | | | | | | | | | | | | | | |
|--------|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|

23-valent pneumococcal polysaccharide vaccine (PPSV23)

Pneumovax23[®], Merck
Since 1983

13-valent pneumococcal conjugate vaccine (PCV13)

Prevnar13[®], Pfizer
Since 2011 (for adults)

In 2021, 2 new pneumococcal conjugate vaccines were licensed for use in U.S. adults.

| | 1 | 3 | 4 | 5 | 6A | 6B | 7F | 9V | 14 | 18 C | 19 A | 19 F | 23 F | 22 F | 33 F | 8 | 10 A | 11 A | 12 F | 15 B | 2 | 9N | 17 F | 20 | |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|-------|---------|---------|---------|---------|-------|--------|---------|--------|--------|
| PCV13 | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | White | White | White | White | White | White | White | White | White | White | White | White |
| PCV15 | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Green | Green | White | White | White | White | White | White | White | White | White | White |
| PCV20 | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Green | Green | Blue | Blue | Blue | Blue | Blue | Blue | White | White | White | White |
| PPSV23 | Yellow | Yellow | Yellow | Yellow | White | White | White | White | White | White | White | White | White | Green | Green | Blue | Blue | Blue | Blue | Blue | Blue | Orange | Orange | Orange | Orange |

23-valent pneumococcal polysaccharide vaccine (PPSV23)

Pneumovax23[®], Merck

13-valent pneumococcal conjugate vaccine (PCV13)

Prevnar13[®], Pfizer

15-valent pneumococcal conjugate vaccine (PCV15)

Vaxneuvance[™], Merck

20-valent pneumococcal conjugate vaccine (PCV20)

Prevnar20[™], Pfizer

New recommendations simplified the previous recommendations for adults aged ≥ 65 years.

| | Previous Recommendation | New Recommendation |
|-------------------------------------|---|--|
| None of the conditions listed below | PCV13* based on shared clinical decision making, PPSV23 for all | PCV20 OR PCV15 and PPSV23 |
| Chronic medical conditions† (CMC) | | |
| Cochlear implant, CSF leak | | |
| Immunocompromising conditions | | |

PCV13: 13-valent pneumococcal conjugate vaccine, PCV15: 15-valent pneumococcal conjugate vaccine, PCV20: 20-valent pneumococcal conjugate vaccine, PPSV23: 23-valent pneumococcal polysaccharide vaccine

*If not previously given; †Examples include alcoholism, chronic heart/liver/lung disease, diabetes, cigarette smoking
<https://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf>

New recommendations simplified the previous recommendations for adults aged 19–64 years with risk factors

| | Previous Recommendations | New Recommendations |
|--|---|--|
| None of the conditions listed below | No recommendation | No recommendation |
| Chronic medical conditions† (CMC) | PPSV23 | PCV20 OR PCV15 and PPSV23 |
| Cochlear implant, CSF leak | Both PCV13* and PPSV23 | |
| Immunocompromising conditions | Both PCV13* and PPSV23, repeat PPSV23 after 5 years | |

PCV13: 13-valent pneumococcal conjugate vaccine, PCV15: 15-valent pneumococcal conjugate vaccine, PCV20: 20-valent pneumococcal conjugate vaccine, PPSV23: 23-valent pneumococcal polysaccharide vaccine

*If not previously given; †Examples include alcoholism, chronic heart/liver/lung disease, diabetes, cigarette smoking
<https://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf>

The two newly licensed vaccines are pneumococcal conjugate vaccines.

| | 1 | 3 | 4 | 5 | 6A | 6B | 7F | 9V | 14 | 18 C | 19 A | 19 F | 23 F | 22 F | 33 F | 8 | 10 A | 11 A | 12 F | 15 B | 2 | 9N | 17 F | 20 | |
|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|---------|---------|---------|---------|---------|------|---------|---------|---------|---------|------|--------|---------|--------|--------|
| PCV13 | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | | | | | | | | | | | | |
| PCV15 | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Green | Green | | | | | | | | | | |
| PCV20 | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Green | Green | Blue | Blue | Blue | Blue | Blue | Blue | | | | |
| PPSV23 | Yellow | Yellow | Yellow | Yellow | White | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Yellow | Green | Green | Blue | Blue | Blue | Blue | Blue | Blue | Orange | Orange | Orange | Orange |

23-valent pneumococcal polysaccharide vaccine (PPSV23)

Pneumovax23[®], Merck

13-valent pneumococcal conjugate vaccine (PCV13)

Prevnar13[®], Pfizer

15-valent pneumococcal conjugate vaccine (PCV15)

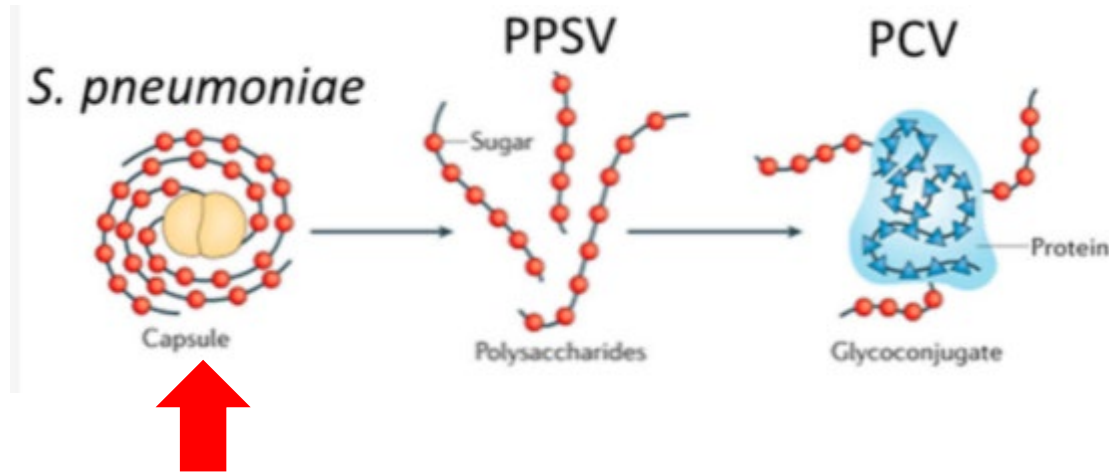
Vaxneuvance[™], Merck

20-valent pneumococcal conjugate vaccine (PCV20)

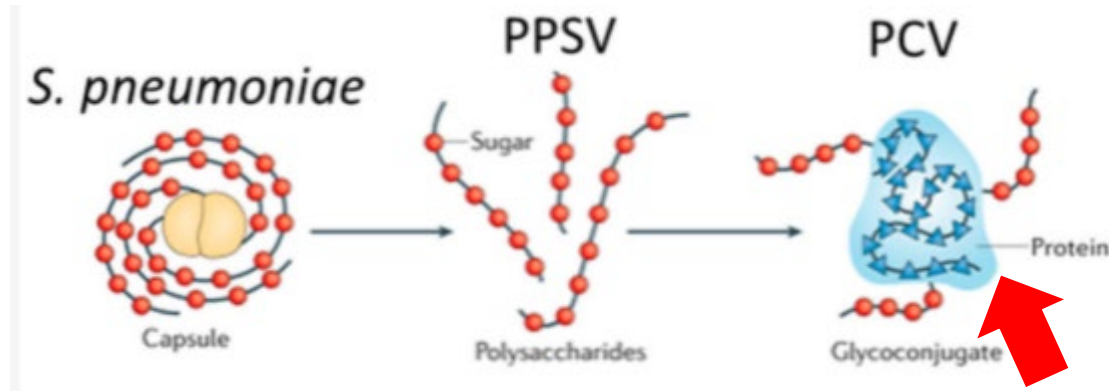
Prevnar20[™], Pfizer

Pneumococcal Conjugate Vaccines

Pneumococcus is classified into “serotypes” based on **capsular polysaccharide**, which are used as vaccine antigens.



In the pneumococcal conjugate vaccine (PCV), the capsular polysaccharides are conjugated to a **carrier protein**.



| | PCV | PPSV23 |
|------------------------------|--|----------------------------------|
| Basic Vaccine Composition | Capsular polysaccharides conjugated to CRM197 Carrier Protein | Capsular polysaccharide antigens |
| Mechanism of action | T-cell dependent | T-cell independent |
| Memory B cell production | Yes | No |
| Reduce pneumococcal carriage | Yes | No |

PCV: pneumococcal conjugate vaccine, PPSV23: 23-valent pneumococcal polysaccharide vaccine

Pneumococcal carriage is precursor to pneumococcal disease.

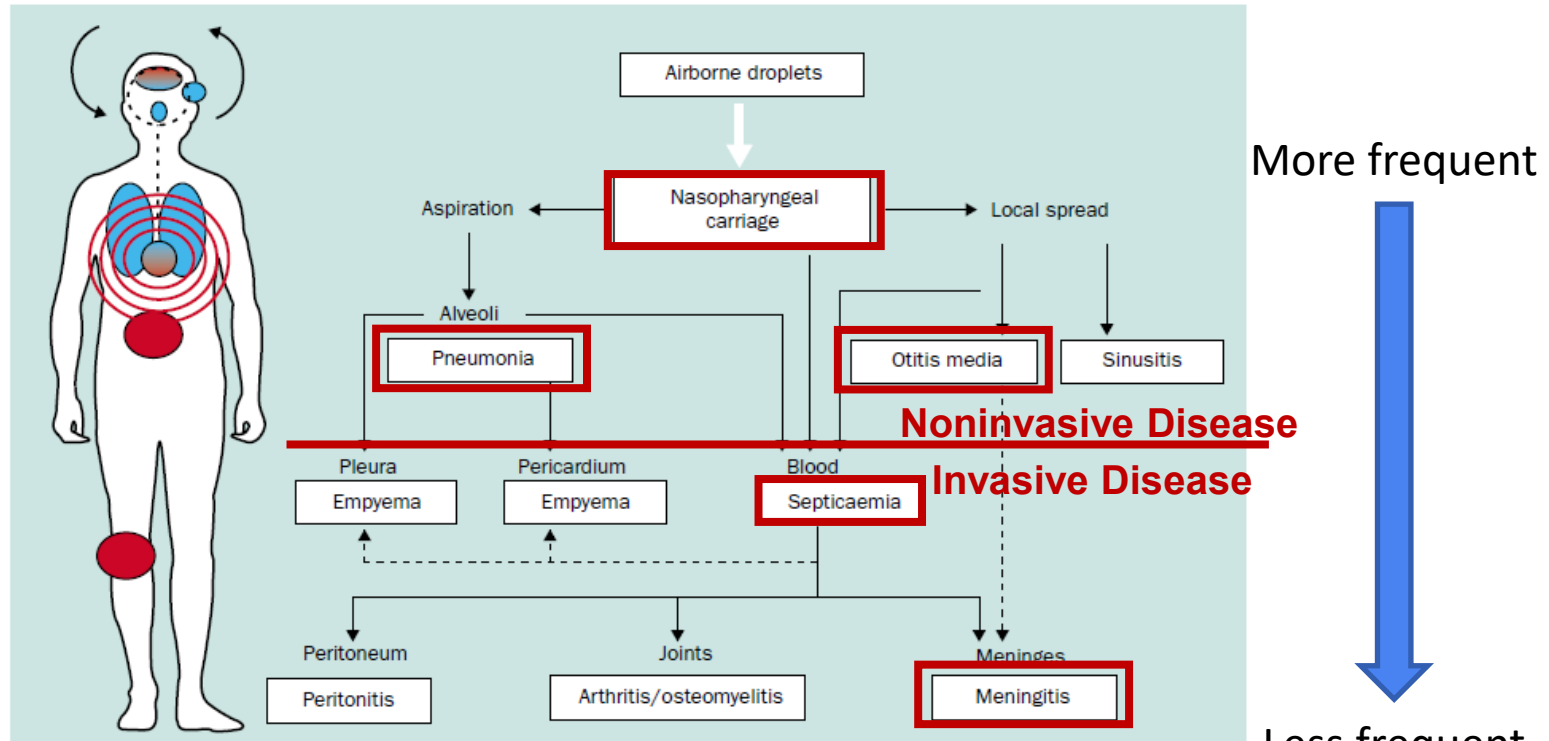


Figure 1. Pathogenic route for *S. pneumoniae* infection. Redrawn from reference 2. Organs infected through the airborne and haematogenic routes are depicted in blue and red, respectively.

Pneumococcal carriage is precursor to pneumococcal disease.

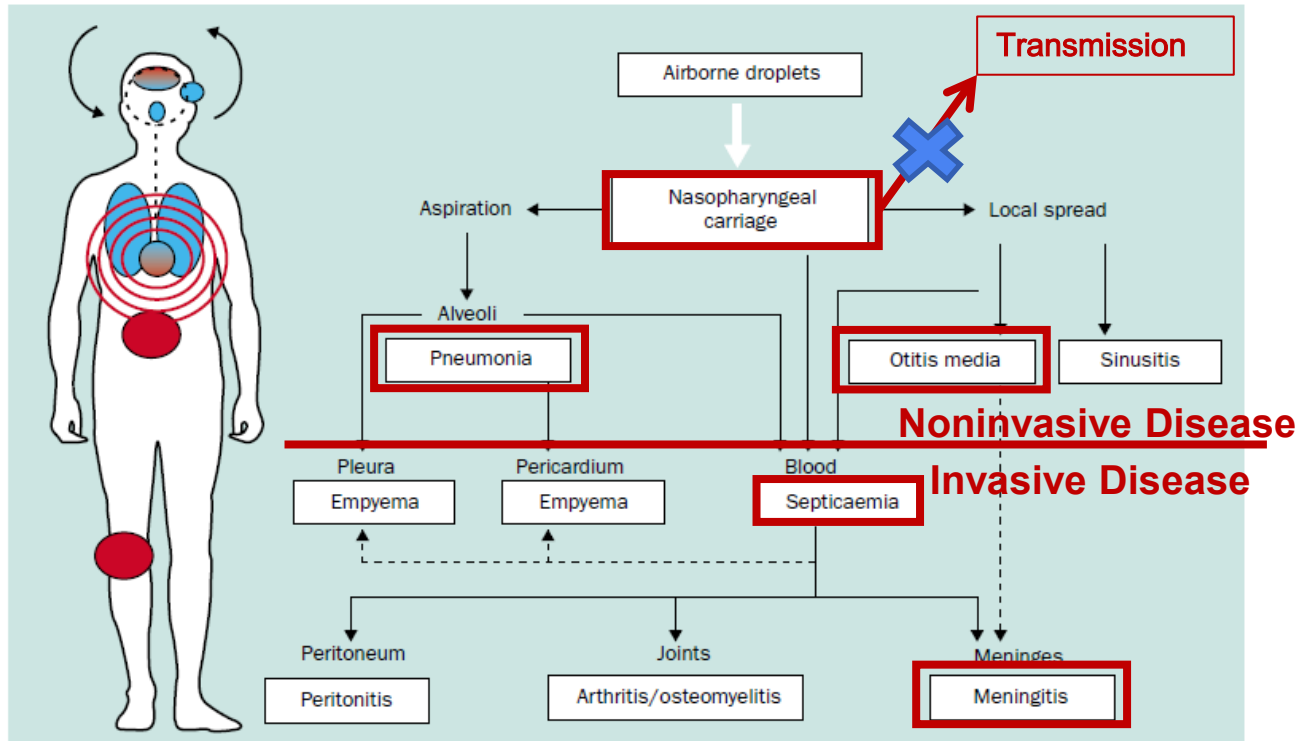
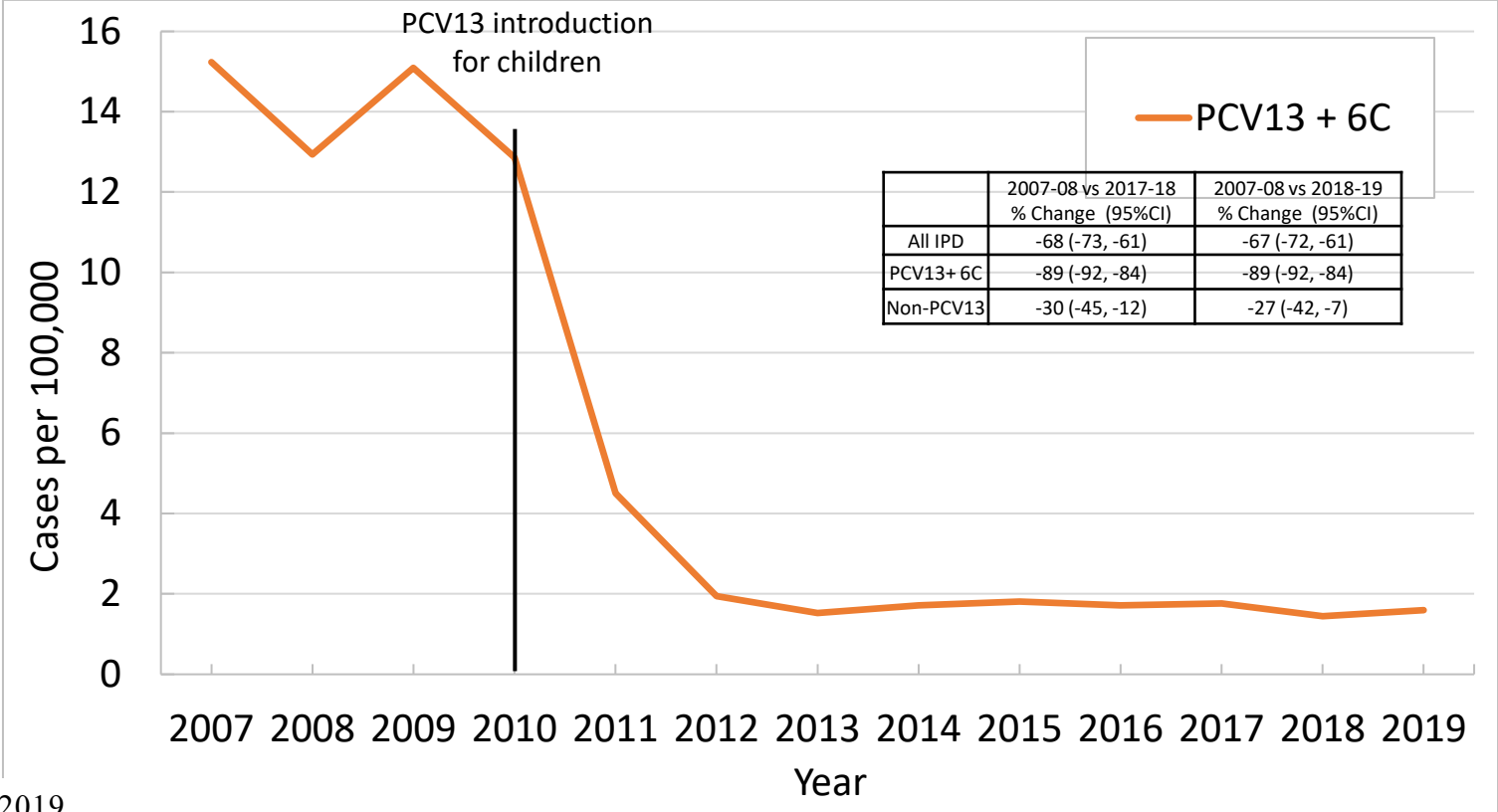
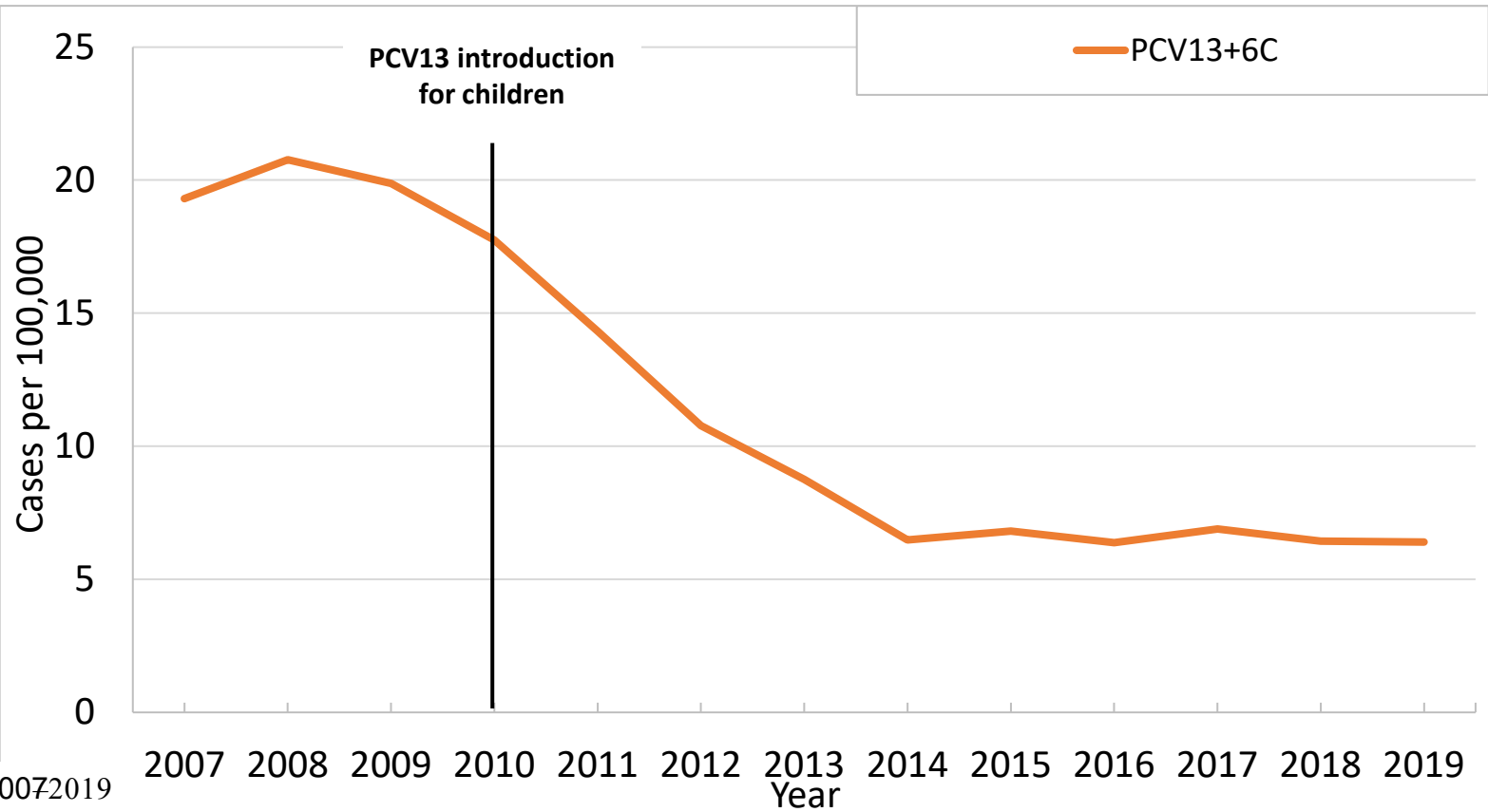


Figure 1. Pathogenic route for *S. pneumoniae* infection. Redrawn from reference 2. Organs infected through the airborne and haematogenic routes are depicted in blue and red, respectively.

PCV13 use in children not only reduced vaccine-type invasive pneumococcal disease incidence in children who received the vaccine....

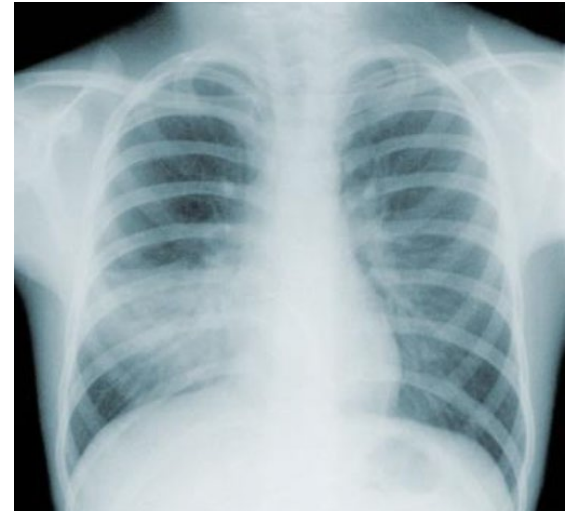


But also in adults, including adults aged ≥ 65 years, likely due to pediatric indirect effects.



| | PCV | PPSV23 |
|------------------------------|--|----------------------------------|
| Basic Vaccine Composition | Capsular polysaccharides conjugated to CRM197 Carrier Protein | Capsular polysaccharide antigens |
| Mechanism of action | T-cell dependent | T-cell independent |
| Memory B cell production | Yes | No |
| Reduce pneumococcal carriage | Yes | No |
| Protection against IPD | Yes | Yes |

IPD: invasive pneumococcal disease, PCV: pneumococcal conjugate vaccine, PPSV23-23 pneumococcal polysaccharide vaccine

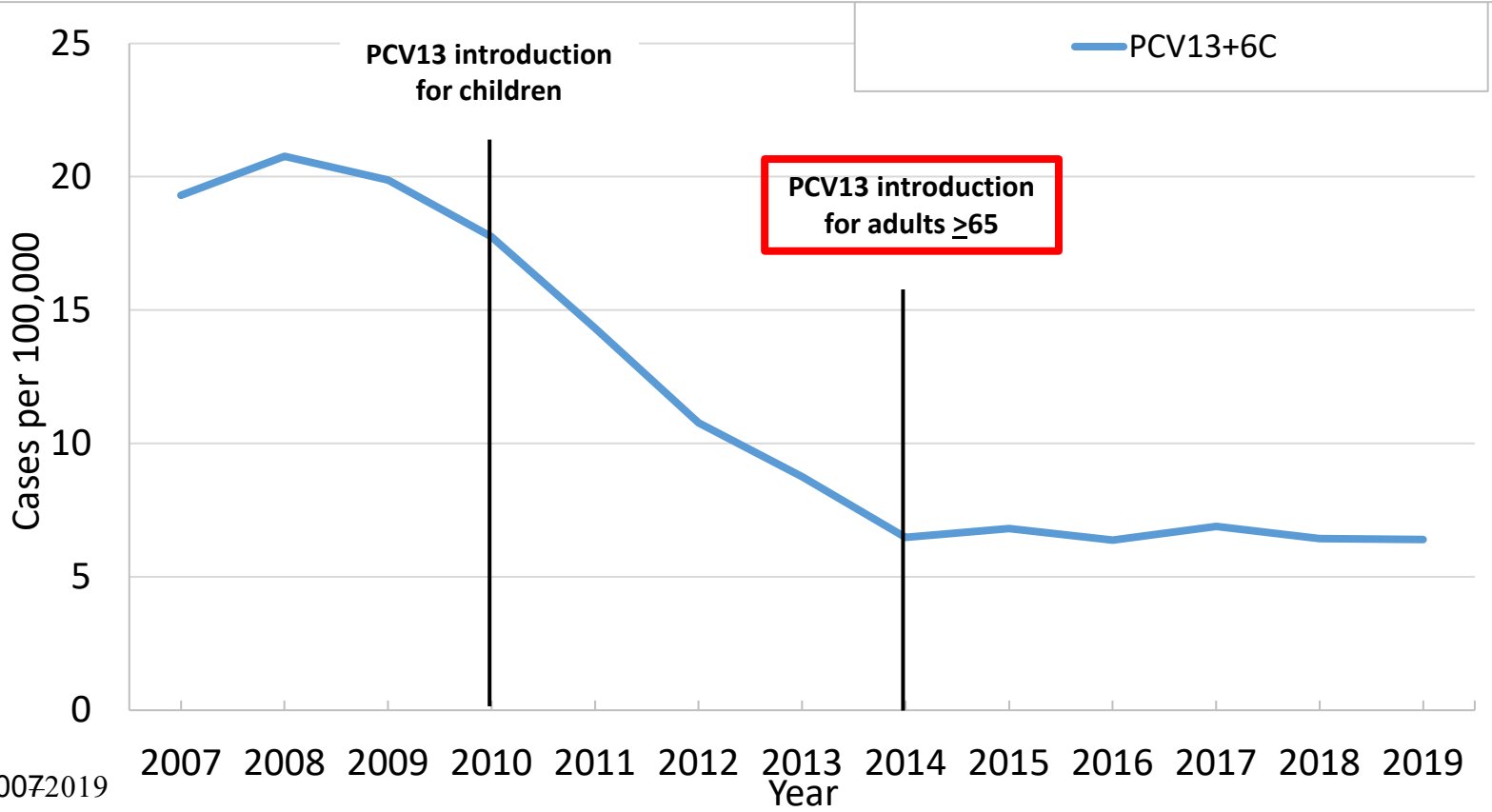


Polysaccharide Conjugate Vaccine against Pneumococcal Pneumonia in Adults

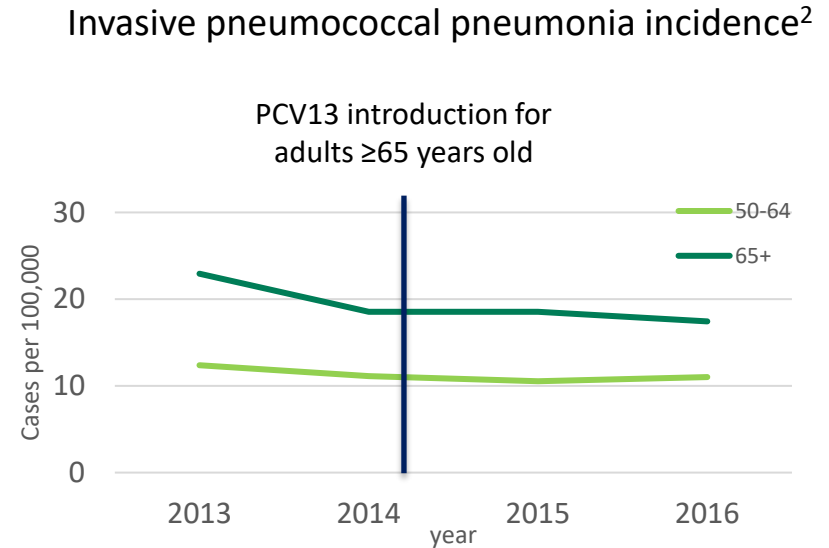
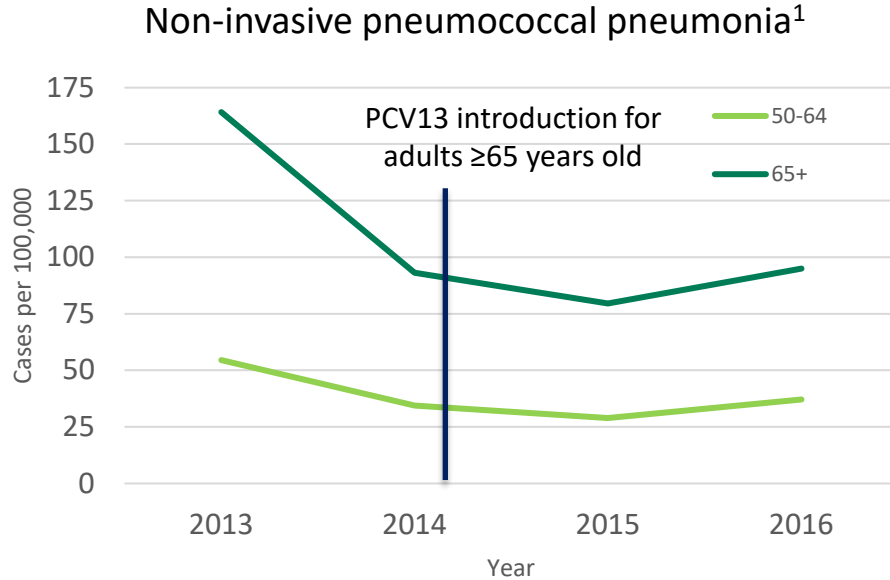
M.J.M. Bonten, S.M. Huijts, M. Bolkenbaas, C. Webber, S. Patterson, S. Gault, C.H. van Werkhoven, A.M.M. van Deursen, E.A.M. Sanders, T.J.M. Verheij, M. Patton, A. McDonough, A. Moradoghli-Haftvani, H. Smith, T. Mellelieu, M.W. Pride, G. Crowther, B. Schmoele-Thoma, D.A. Scott, K.U. Jansen, R. Lobatto, B. Oosterman, N. Visser, E. Caspers, A. Smorenburg, E.A. Emini, W.C. Gruber, and D.E. Grobbee

- A randomized placebo-controlled trial among community-dwelling, pneumococcal vaccine naïve adults aged ≥ 65 years in the Netherlands (CAPITA trial).
- PCV13 had **45% vaccine efficacy** against 1st episode of vaccine-type nonbacteremic/noninvasive pneumococcal pneumonia.

The CAPITA trial findings were decisive in the 2014 recommendation on routine PCV13 use for all adults aged ≥ 65 years in series with PPSV23.



Population-Level Impact on Non-Invasive and Invasive Pneumonia



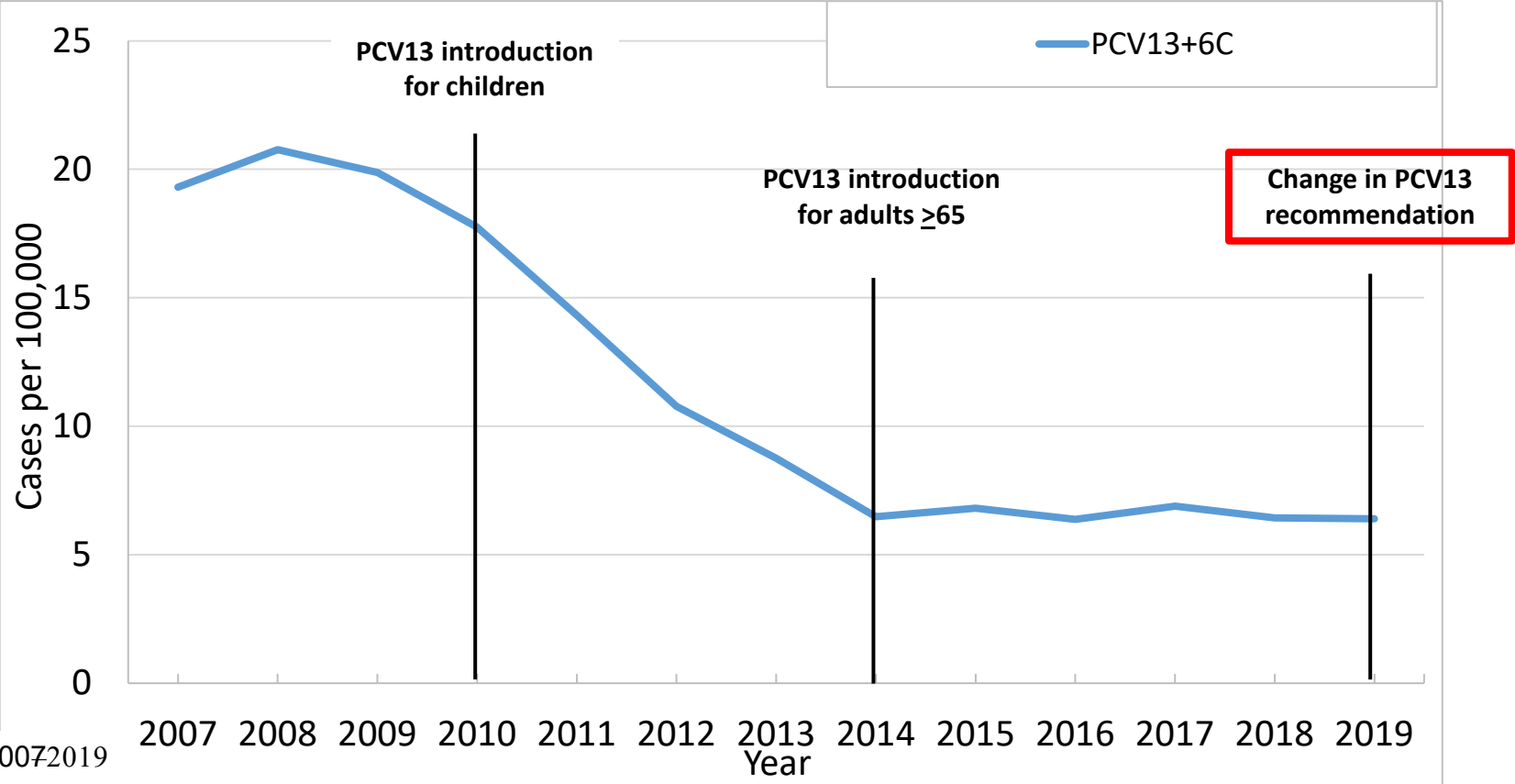
Key Points:

- Decline in non-invasive pneumonia observed between 2013 and 2014 (indirect effects)
- No further population-level impact on non-invasive or invasive pneumonia since 2014

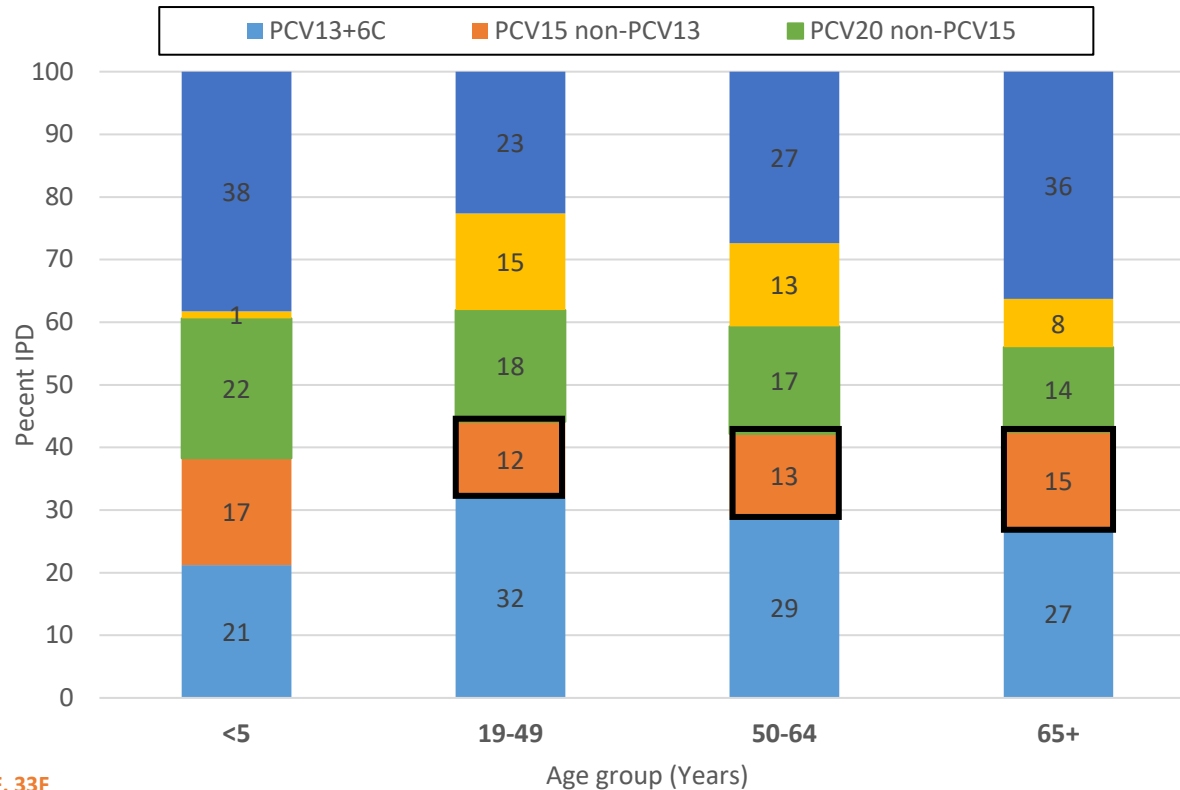
¹Gierke. ACIP October 2018. Surveillance for Non-Invasive Pneumococcal Pneumonia (SNIpp), unpublished data

²Active Bacterial Core Surveillance (ABCs), unpublished data

Routine PCV13 use for adults aged ≥ 65 years was changed to recommendation based on shared clinical decision-making in 2019.



In 2018–2019, 2 additional serotypes included in PCV15 accounted for 12–15% of IPD in adults.

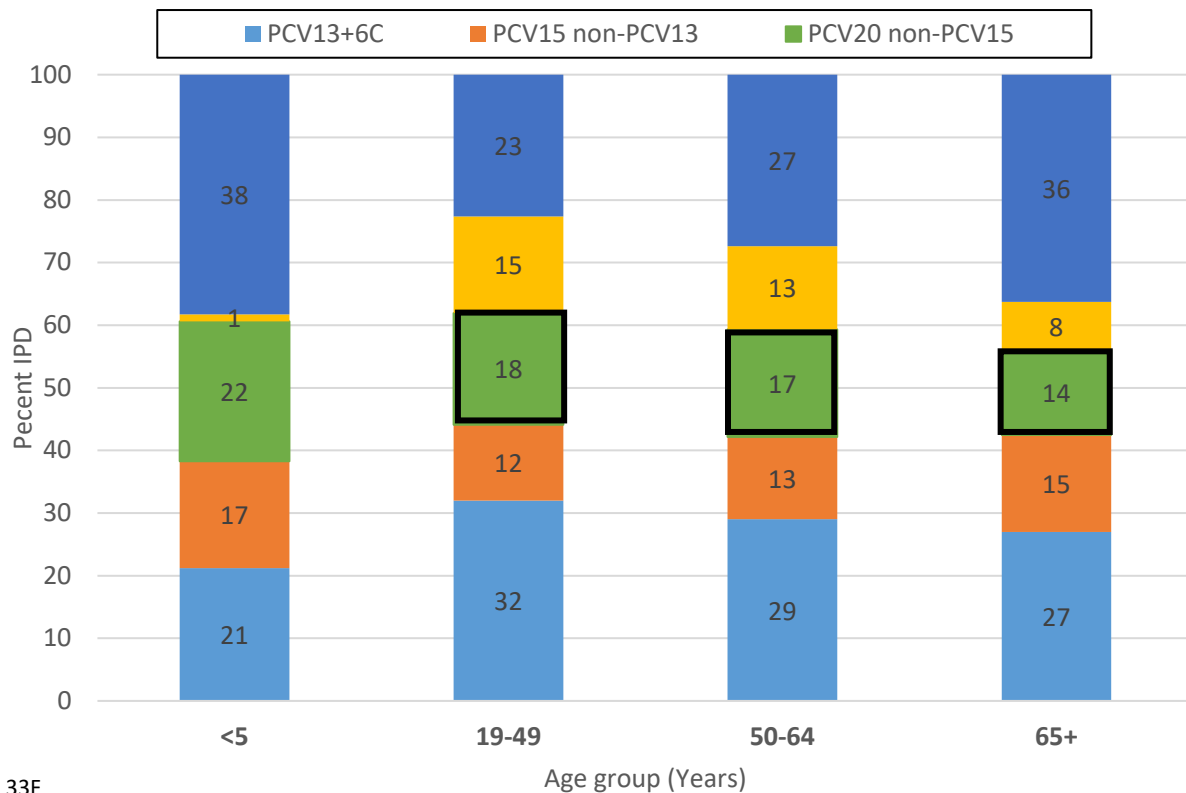


PCV15 non-PCV13 serotypes: 22F, 33F

PCV20 non-PCV15 serotypes: 8, 10A, 11A, 12F, 15B/C

PPSV23 non-PCV20 serotype: 2, 9N, 17F, 20

In 2018–2019, 5 additional serotypes included in PCV20 accounted for 14–18% of IPD in adults.

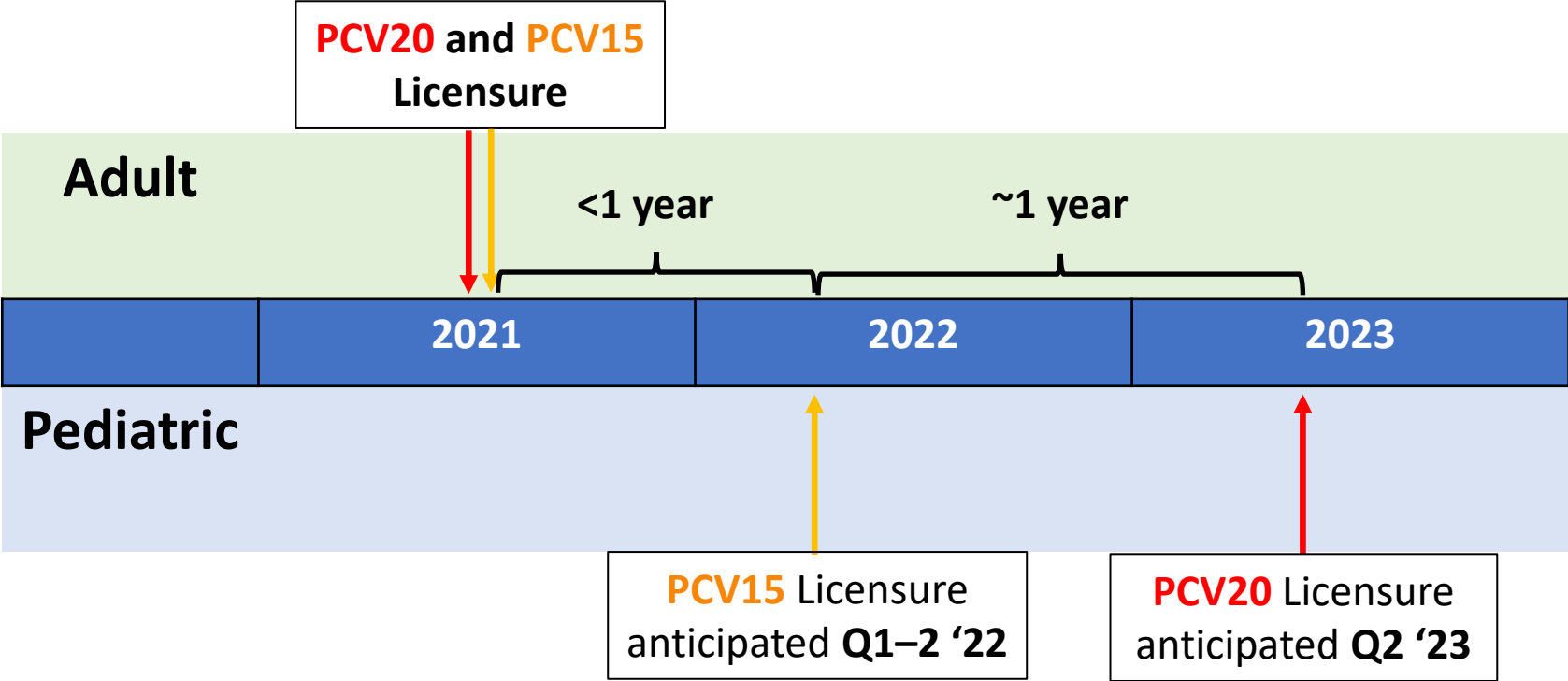


PCV15 non-PCV13 serotypes: 22F, 33F

PCV20 non-PCV15 serotypes: 8, 10A, 11A, 12F, 15B/C

PPSV23 non-PCV20 serotype: 2, 9N, 17F, 20

Unlike PCV13, PCV20 and PCV15 were licensed for use in adults first.



New pneumococcal vaccine recommendations and guidance

Adults who have not previously received PCV or whose previous vaccination history is unknown

- Adults aged ≥ 65 years
- Adults aged 19–64 years with certain underlying medical conditions or other risk factors*
 - Give one dose of **PCV20**, OR
 - Give one dose of **PCV15** followed by a dose of **PPSV23 ≥ 1 year**
 - A minimum interval of **8 weeks** can be considered for adults with an immunocompromising condition**, cochlear implant, or cerebrospinal fluid leak to minimize the risk for IPD caused by serotypes unique to PPSV23

*Alcoholism; chronic heart, liver, or lung disease; chronic renal failure; cigarette smoking; cochlear implant; congenital or acquired asplenia; cerebrospinal fluid leak; diabetes mellitus; generalized malignancy; HIV; Hodgkin disease; immunodeficiency; iatrogenic immunosuppression; leukemia, lymphoma, or multiple myeloma; nephrotic syndrome; solid organ transplant; sickle cell disease; or other hemoglobinopathies.

**chronic renal failure, nephrotic syndrome, immunodeficiency, iatrogenic immunosuppression, generalized malignancy, HIV, Hodgkin disease, leukemia, lymphoma, multiple myeloma, solid organ transplant, congenital or acquired asplenia, sickle cell disease, or other hemoglobinopathies.

Adults with previous PPSV23 only

- May receive one dose of PCV20 or PCV15 ≥ 1 year after their last PPSV23 dose.
 - When PCV15 is used, no need to be followed by another dose of PPSV23

Adults with previous PCV13, with/without PPSV23

- The incremental public health benefits of providing PCV15 or PCV20 to these adults have not been evaluated.
- Complete the previously recommended PPSV23 series.
 - For adults who have received PCV13 but have not completed their recommended pneumococcal vaccine series with PPSV23, one dose of PCV20 may be used if PPSV23 is not available.


Coadministration with other vaccines

- PCV15, PCV20, PPSV23 can be coadministered with a quadrivalent influenza vaccine.
- Evaluation of coadministration of PCV15, PCV20, or PPSV23 with COVID-19 vaccines is ongoing.
- No data are available on coadministration with other vaccines.

At this time, CDC does not have recommendations on repeating the **PCV15** or **PCV20** doses

- Limited data on duration of protection from these vaccines
- Impact of indirect effects from **PCV15** (licensure anticipated in 2022) or **PCV20** (licensure anticipated in 2023) use in children is unknown
- Next generation pneumococcal vaccines are under development

PneumoRecs VaxAdvisor Mobile App for Vaccine Providers

 The PneumoRecs VaxAdvisor Mobile App was updated on February 9, 2022, to reflect CDC's new adult pneumococcal vaccination recommendations.

The *PneumoRecs VaxAdvisor* mobile app helps vaccination providers quickly and easily determine which pneumococcal vaccines a patient needs and when. The app incorporates recommendations for all ages so internists, family physicians, pediatricians, and pharmacists alike will find the tool beneficial.

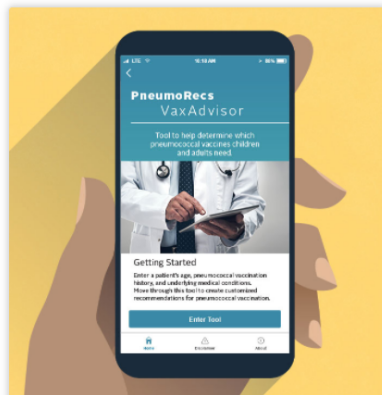
Users simply:

- Enter a patient's age.
- Note if the patient has specific underlying medical conditions.
- Answer questions about the patient's pneumococcal vaccination history.

Then the app provides patient-specific guidance consistent with the immunization schedule recommended by the U.S. Advisory Committee on Immunization Practices (ACIP).

Download the App Today

Download PneumoRecs VaxAdvisor for free:



PneumoRecs VaxAdvisor is available for download on iOS and Android mobile devices.

More materials coming!

Pneumococcal Vaccine Recommendations

Below are summaries of recommendations from CDC's Advisory Committee on Immunization Practices (ACIP). For the full text of the recommendations, see [Pneumococcal ACIP Vaccine Recommendations](#).

Vaccination of Infants, Children, and Adults 65 Years or Older

CDC recommends routine administration of pneumococcal conjugate vaccine (PCV13) for all children younger than 2 years of age:

- Give PCV13 to infants as a series of 4 doses, one dose at each of these ages: 2 months, 4 months, 6 months, and 12 through 15 months.

On This Page

[Routine Vaccination of Infants, Children, and Adults 65 Years or Older](#)

[Vaccination of Older Children and Adults with Certain Indications](#)

[Catch-up Guidance for Children 4 Months through 18 Years](#)

[Contraindications and Precautions](#)

PneumoRecs VaxAdvisor: <https://www.cdc.gov/vaccines/vpd/pneumo/hcp/pneumoapp.html>

Pneumococcal Vaccine Recommendations website: <https://www.cdc.gov/vaccines/vpd/pneumo/hcp/recommendations.html>