rise to immunize
AMGA Foundation

Thank you for joining

The presentation will
begin shortly

rise to immunize
AMGA Foundation

Rise to Immunize™ Monthly Webinar

Pneumococcal 101

Featuring Frank Colangelo, M.D., M.S.-HQS, FACP

AMGA

Today's Webinar

Campaign Updates

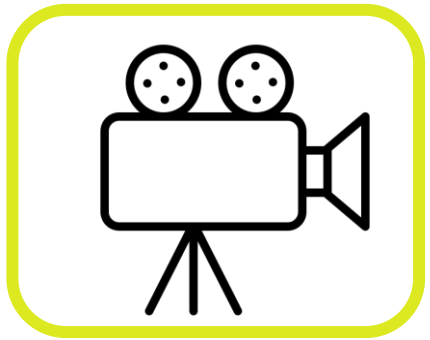
- AMGA Annual Conference
- Blinded Comparative Report

Pneumococcal 101

- Featuring Frank Colangelo, MD, MS-HQS, FACP
- Campaign measures update

Q&A Session

Webinar Reminders



Today's webinar recording will be available the week of **3/21**

- Will be sent via email
- Will be available on website

(RiseToImmunize.org → "Resources" → "Webinars")

Ask questions during the webinar using the **Q&A feature**

- Questions will be answered at the end of the presentation

AMGA Annual Conference 2022

RIZE participants networking over breakfast

Foundation Celebration remarks from Eric Anderson, Director, US Adult Vaccines, Pfizer Inc. (Founding Sponsor)

Limited edition RIZE mugs for campaign participants at AC22

Flu Season (Measurement Year)[1]	Reporting Quarter[2]	Report Due Date	Blinded Comparative Report Provided
2021	Q3 2021	Feb 15, 2022	Mar 29, 2022
	Q4 2021		
	Q1 2022	Apr 15, 2022	May 27, 2022
	Q2 2022	Jul 15, 2022	Aug 26, 2022
2022	Q3 2022	Oct 14, 2022	Nov 29, 2022
	Q4 2022	Jan 17, 2023	Feb 28, 2023
	Q1 2023	Apr 14, 2023	May 26, 2023
	Q2 2023	Jul 14, 2023	Aug 25, 2023
2023	Q3 2023	Oct 16, 2023	Nov 29, 2023
	Q4 2023	Jan 16, 2024	Feb 27, 2024
	Q1 2024	Apr 15, 2024	May 29, 2024
	Q2 2024	Jul 15, 2024	Aug 26, 2024
2024	Q3 2024	Oct 15, 2024	Nov 26, 2024
	Q4 2024	Jan 15, 2025	Feb 26, 2025
	Q1 2025	Apr 15, 2025	May 28, 2025
	Q2 2025	Jul 15, 2025	Aug 26, 2025

Thank you for submitting your data!

The blinded comparative report will be provided on **March 29**

Today's Speaker

Frank Colangelo, MD, MS-HQS, FACP

Chief Quality Officer, Premier Medical Associates, P.C.

Pneumococcal 101

Francis R Colangelo MD, MS-HQS, FACP
Director, Outcomes Office, Allegheny Health Network
Chief Quality Officer, Premier Medical Associates

PRACTICE INTRODUCTION

Introduction

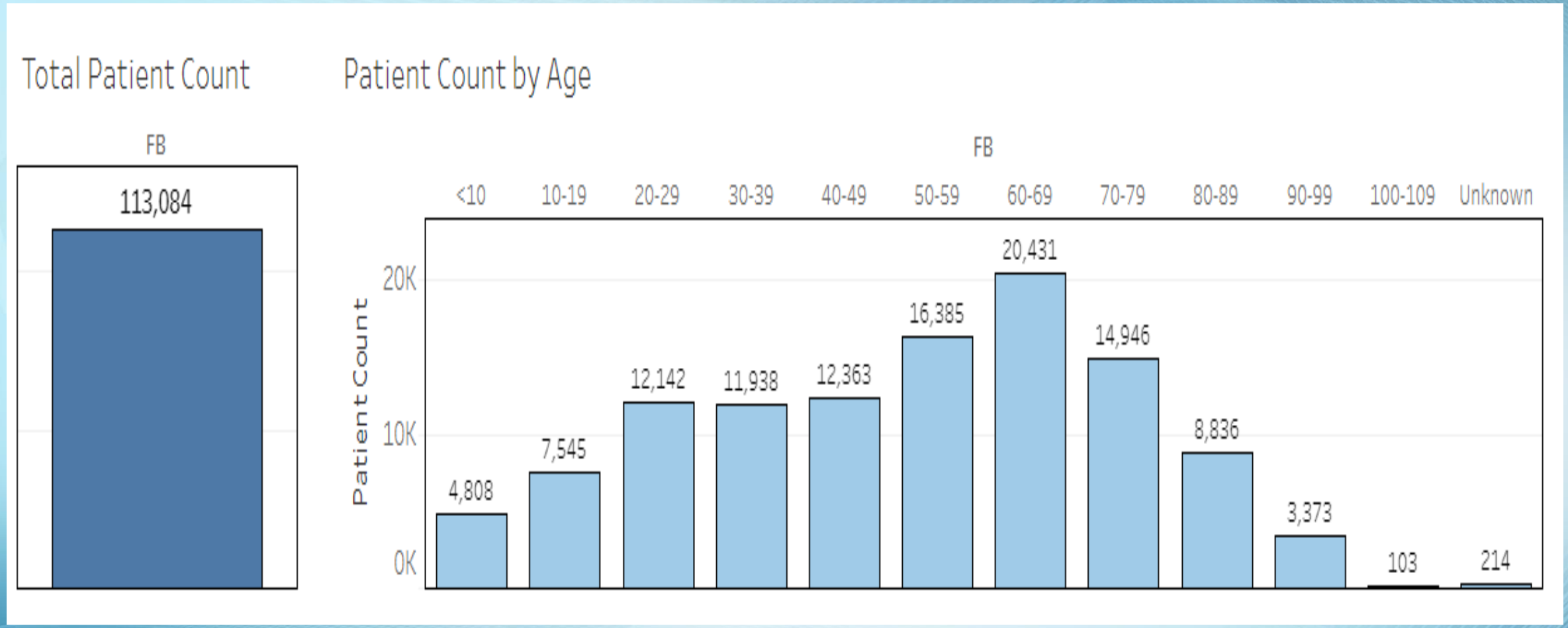
Premier Medical Associates

- Formed 1993
- 106 Providers
- 1:1 PCP/Specialist
- Eastern Suburbs of Pittsburgh, PA

Allegheny Health Network

- Part of blended health organization between Highmark Health and the Allegheny Health Network
- 14 hospital system in Western PA and Western NY
- 2,600 providers

Practice Environment

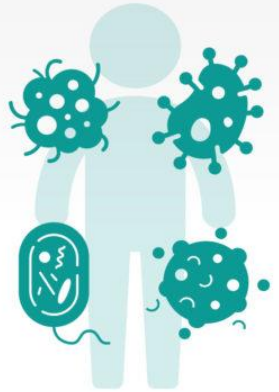


VACCINE PREVENTABLE DISEASE IMPACT

THE COSTS OF VACCINE-PREVENTABLE DISEASE

Flu, pneumococcal disease, shingles and whooping cough cost $27 billion to treat each year in adults over the age of 50.

$27 BILLION
in treatment



VACCINATE YOUR FAMILY
The Next Generation of Every Child By Two

SOURCE:
https://www.cdc.gov/hpv/parents/vaccine/six-reasons.html

STATE OF THE IMMUNION

https://vaccinateyourfamily.org/why-vaccinate/vaccine-benefits/costs-of-disease-outbreaks/

Data Reporting Tracks

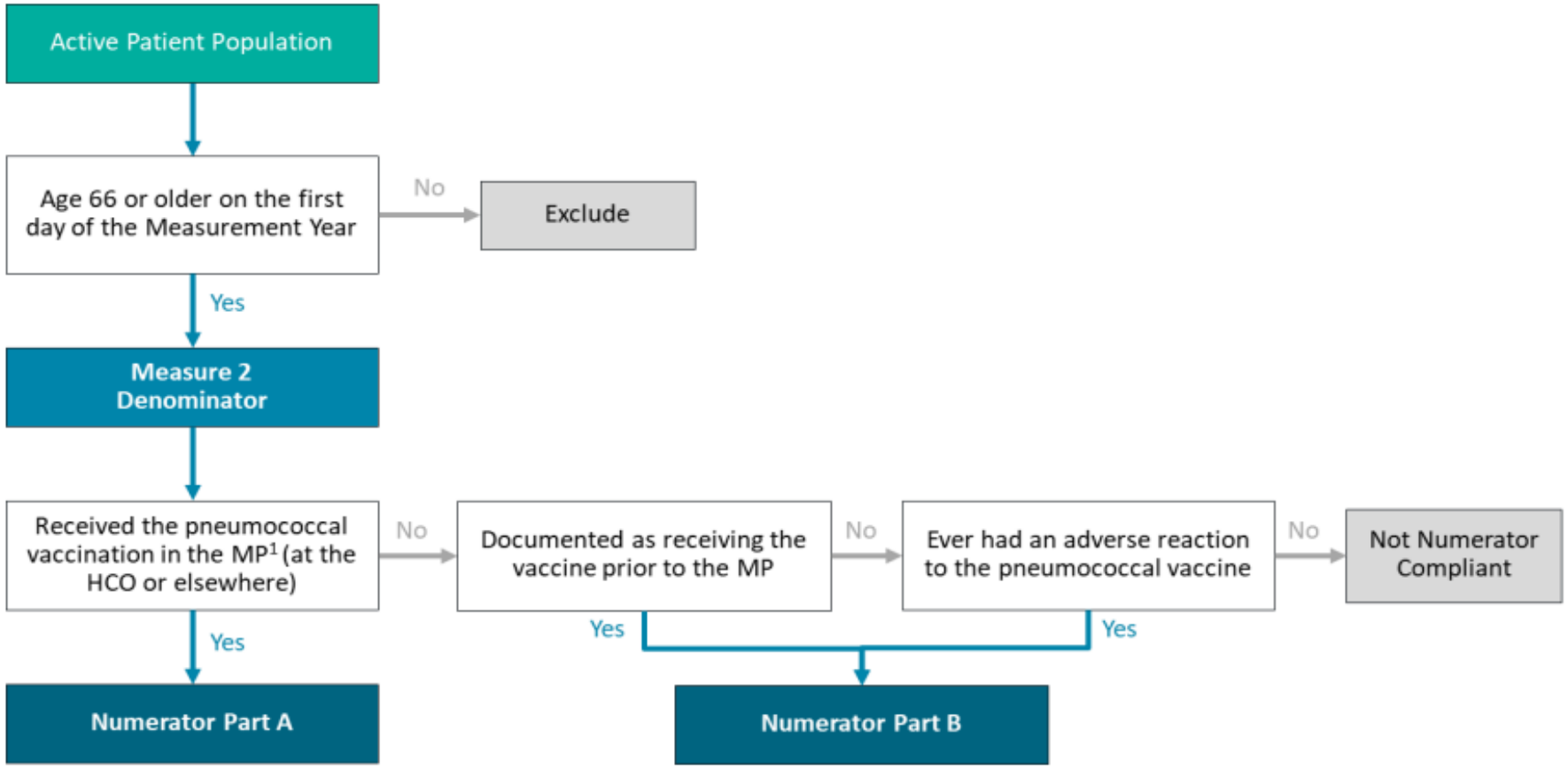
Participating organizations can choose to report data to the campaign according to either the Basic Track or Core Track. Groups have the option to advance from the Basic to Core Track at any point during the four-year campaign.

	BASIC TRACK	CORE TRACK
Influenza (19+)	✓	✓
Pneumococcal (66+)	✓	✓
Td/Tdap (19+)		✓
Zoster (50+)		✓
Bundle		✓

https://www.amga.org/rise-to-immunize/measurement/data-reporting-tracks/

Current Campaign Measure for Pneumococcal Vaccination

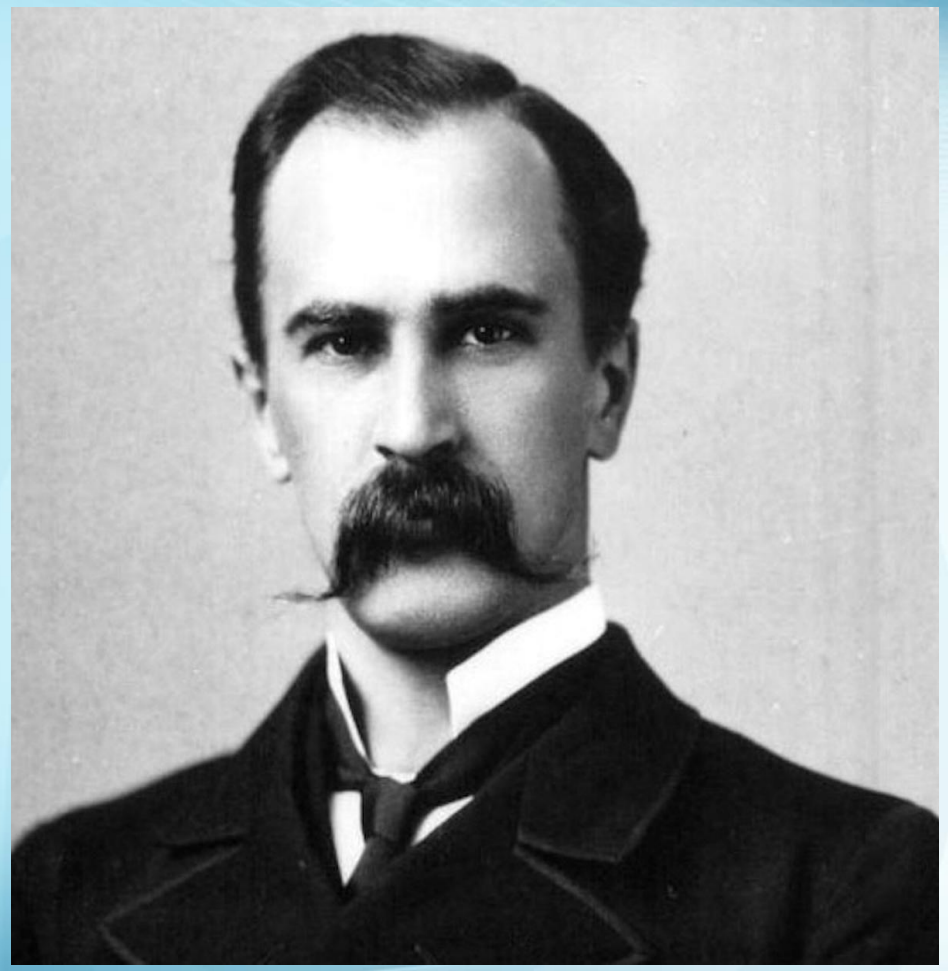
3.4.4 Measure 2 (Pneumococcal) Flowchart



[1] MP = Measurement Period (See Tables 1 & 2)

PNEUMOCOCCAL DISEASE-CLINICAL IMPLICATIONS

The Old Man's Friend



Sir William Osler 1849-1919

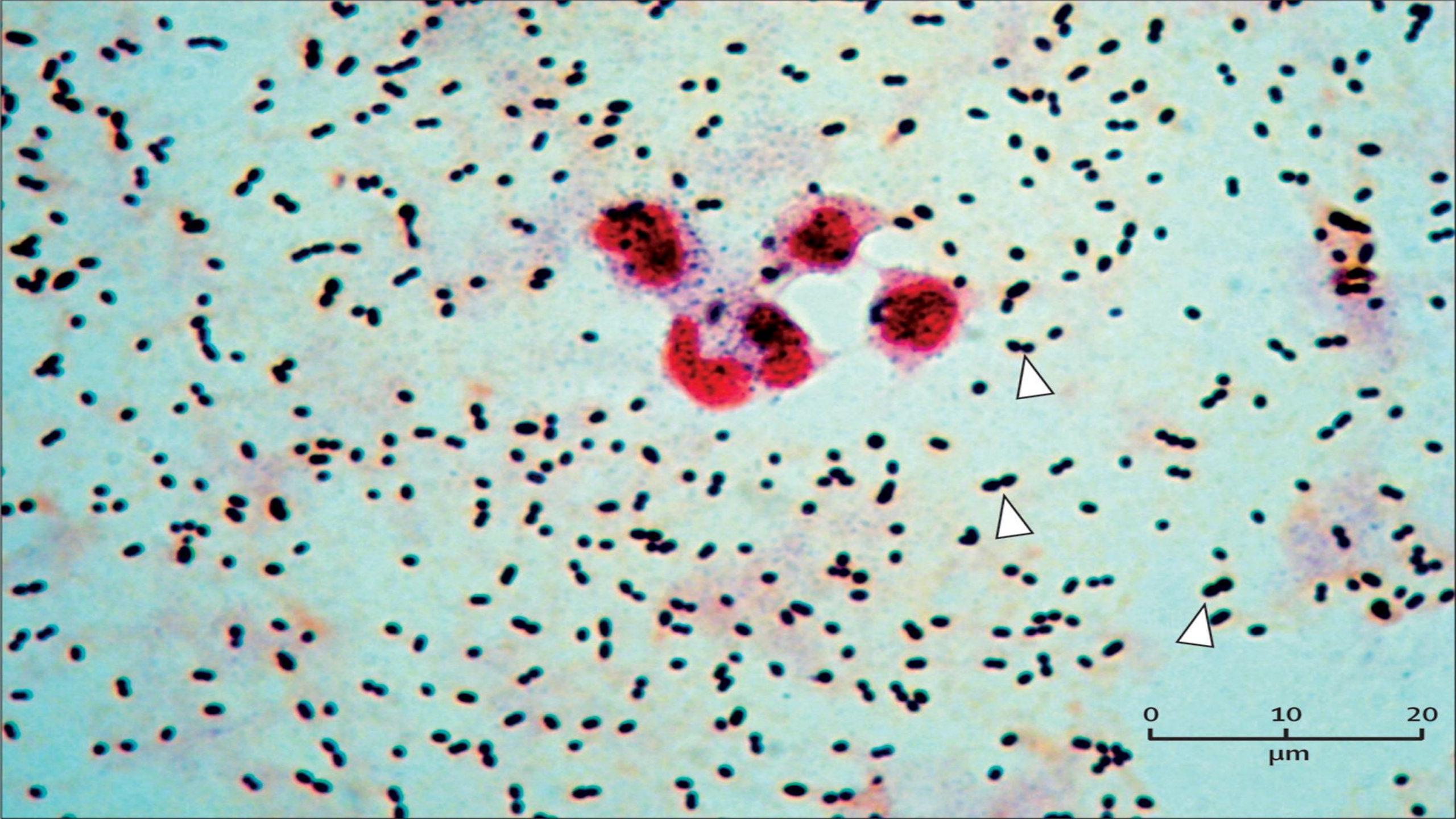
1st edition of his book *The Principles and Practice of Medicine* (1892)

"In children and in healthy adults the outlook is good. In the debilitated, in drunkards and in the aged the chances are against recovery. So fatal is it in the latter class [i.e. the elderly] that it has been termed the natural end of the old man..."

S. pneumoniae

- First isolated by Pasteur in 1881
- Development of gram stain in 1884 helped with reliable identification
- Efforts to develop an effective vaccine began as early as 1911
- Interest decreased after the advent of penicillin

https://www.cdc.gov/vaccines/pubs/pinkbook/pneumo.html


0
10
20
µm

S. pneumoniae

- Complex polysaccharides on surfaces help to determine pathogenicity
- Over 100 serotypes identified by 2020
- Most serotypes can cause serious disease
- Only a few cause most pneumococcal infections
- Asymptomatic carriage rates:
  - Adults 5-10%
  - Children 20-60%

https://www.cdc.gov/vaccines/pubs/pinkbook/pneumo.html

Clinical Presentations

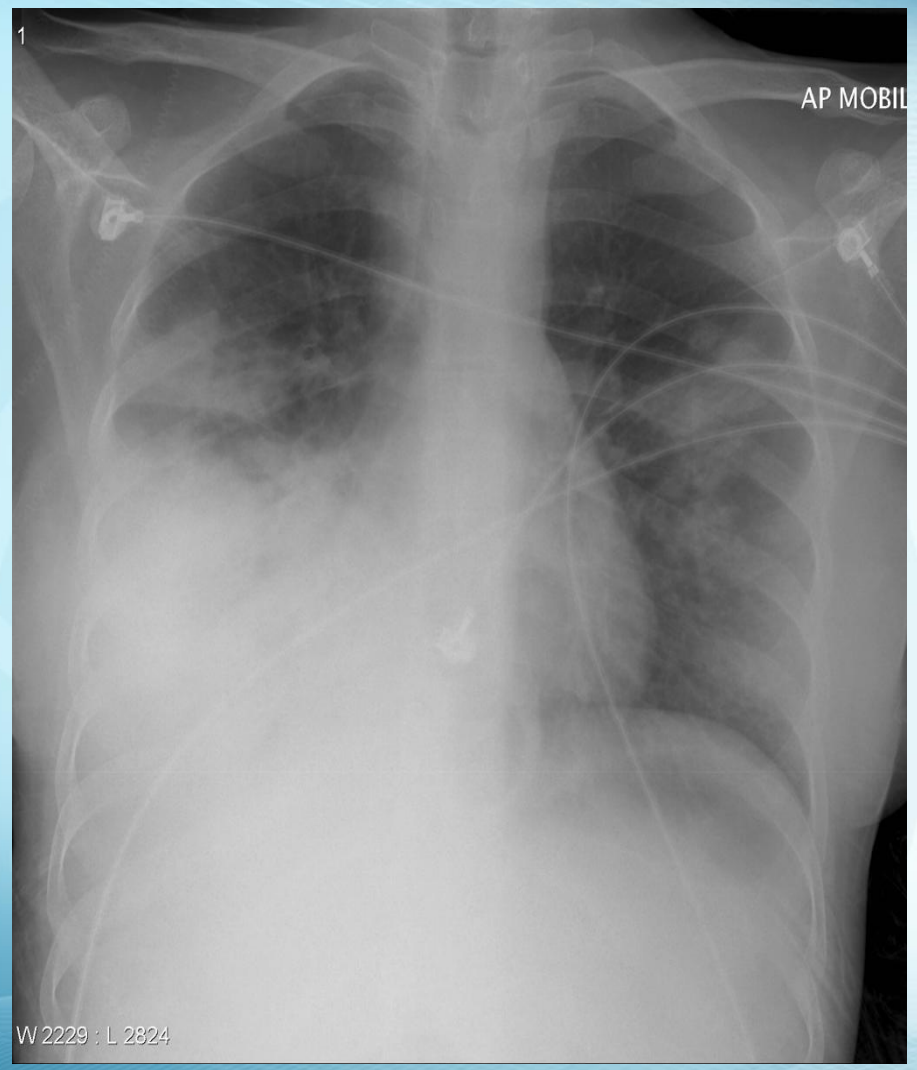
Non invasive infections

- Pneumonia without bacteremia
- Otitis media
- Sinusitis

Invasive Disease

- Pneumonia with bacteremia
- Meningitis
- Septic arthritis
- Bacteremia without obvious infection
- Osteomyelitis

Pneumococcal Disease Manifestations



- **Pneumococcal Pneumonia**
  - Most common clinical presentation
  - 30% of adult CAP
  - 150,000 admits/yr in US
  - 5-7% case fatality rate
    - Higher if older or underlying illness

https://www.cdc.gov/pneumococcal/clinicians/clinical-

Pneumococcal Disease Manifestations

Bacteremia:

- 4,000 cases per year without known source of infection in US
- Can lead to septic arthritis, endocarditis and meningitis
- More common in children
- Case fatality rate 20% (younger) to >60% if older
- Especially bad if prior splenectomy

https://www.cdc.gov/pneumococcal/clinicians/clinical-features.html

Pneumococcal Disease Manifestations

Meningitis:

- 2,000 cases per year in US
- Half of all bacterial meningitis
- Case fatality rate 22% adults
- Neurologic sequellae in >50% of survivors

https://www.cdc.gov/pneumococcal/clinicians/clinical-features.html

Those Adults Most at Risk

- **Chronic Diseases**
  - Chronic CSF Leak
  - Chronic Renal Failure
  - Nephrotic Syndrome
  - Immunosuppressant Drugs
- **Immunocompromising Conditions**
  - HIV
  - B and T Cell deficiencies
  - Complement Deficiencies
  - Phagocytic Disorders
- **Malignancies**
  - Generalized
  - Leukemia
  - Lymphoma
  - Radiation Therapy
- **Other**
  - Cochlear Implants
  - Solid Organ Transplants
  - Multiple Myeloma
  - Anatomic or Functional Asplenia

Additionally at Risk

- **Medical Conditions**
  - Diabetes
  - Chronic Heart Disease
  - Chronic Lung Disease (includes asthma)
  - Inflammatory Bowel Disease
- **Group Living Situations**
  - SNFs/assisted living
  - Jails
  - Homeless
- **Racial/Ethnic Groups with Higher Disease Burden**
  - Black/African Americans
  - Alaska Natives
  - American Indians

Table 1. Incidence of pneumococcal infections in the United States[3]

Age (years)	Disease Incidence Cases/100,000 (number of cases)	Death Rate Deaths/100,000 (number of deaths)
<1	17.7 (702)	0.20 (8)
1	12.6 (500)	0.20 (8)
2–4	5.07 (606)	0.13 (16)
5–17	1.23. (659)	0.00 (0)
18–34	2.33 (1,757)	0.08 (60)
35–49	6.48 (3,982)	0.46 (284)
50–64	14.8 (9,326)	1.47 (932)
65–74	18.0 (4,952)	2.17 (597)
75–84	29.0 (4,042)	4.53 (631)
≥85	45.4 (2,856)	11.4 (718)
Total	9.14 (29,382)	1.01 (3,254)

https://www.cdc.gov/vaccines/pubs/surv-manual/chpt11-pneumo.html

VACCINE OVERVIEW

Pneumococcal Vaccine Development

- 1977 14 valent polysaccharide vaccine
- 1983 23 valent polysaccharide vaccine
- 2000 PCV 7 conjugate vaccine
- 2010 PCV 13
- 2021 PCV 15 and PCV 20

Vaccine Composition

Polysaccharide(PPSV-23)

Purified polysaccharide antigens

Conjugate(PCV 13,15&20)

Capsular polysaccharide antigens conjugated to a protein carrier (non-toxic diphtheria CRM_{197} protein)

Serotypes contained in current and new pneumococcal vaccines

	1	3	4	5	6A	6B	7 F	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	■	■	■	■	■	■	■	■	■	■	■	■	■											
PCV15	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■									
PCV20	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■				
PPSV23	■	■	■	■		■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

For analysis purposes:

- **PCV15 non-PCV13**: includes serotypes **22F and 33F**
- **PCV20 non-PCV15**: includes serotypes **8, 10A, 11A, 12F, and 15B/C**
- **PPSV23 non-PCV20**: includes serotypes **2, 9N, 17F, and 20**

https://www.cdc.gov/vaccines/acip/meetings/downloads/slides-2021-06/02-Pneumococcal-Gierke-508.pdf

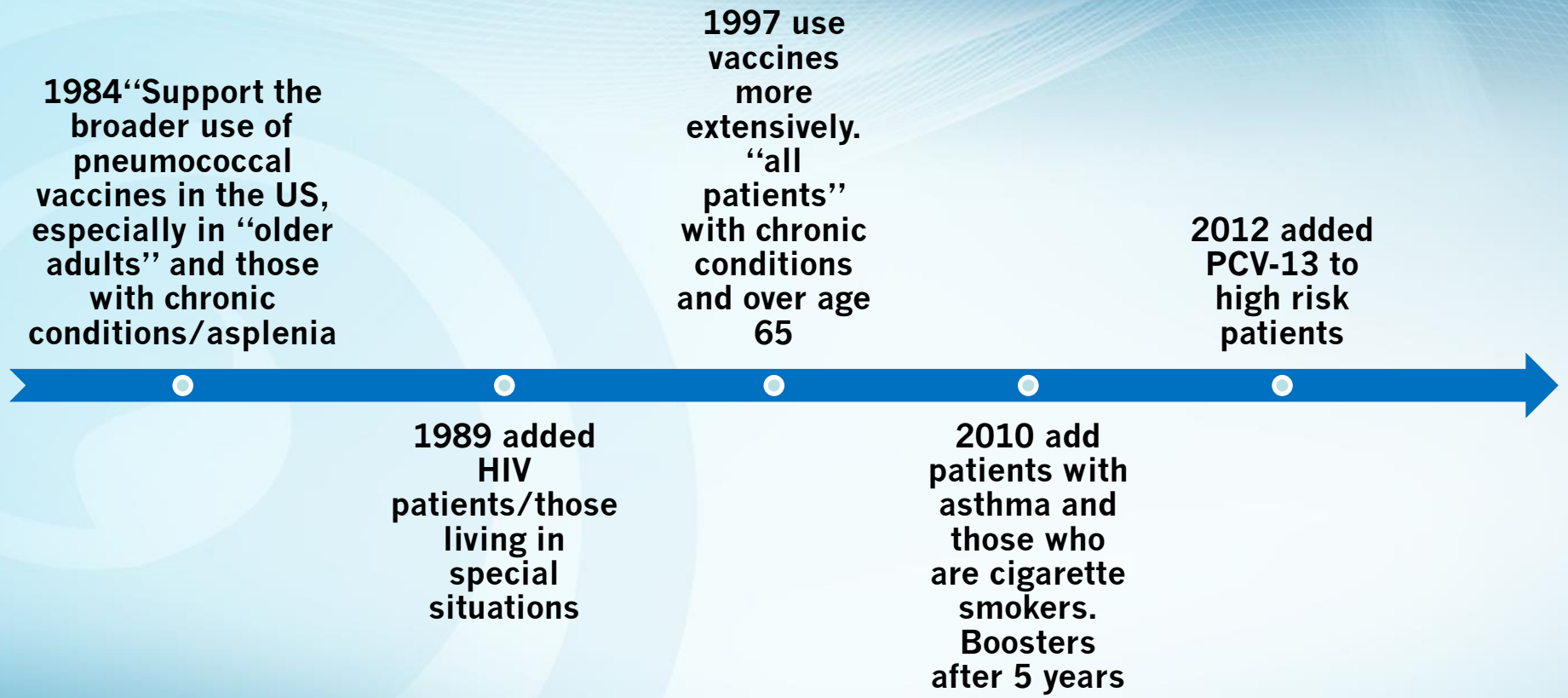
Vaccine Side Effects

- Injection site pain and swelling
- Muscle pain
- Fatigue
- Headache
- Arthralgias

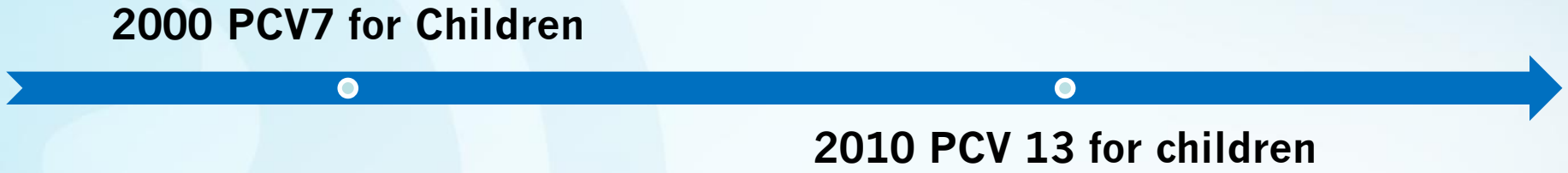
Can not use conjugate vaccines in those patients with severe allergies to diphtheria toxin

A HISTORY OF PNEUMOCOCCAL VACCINE GUIDELINES

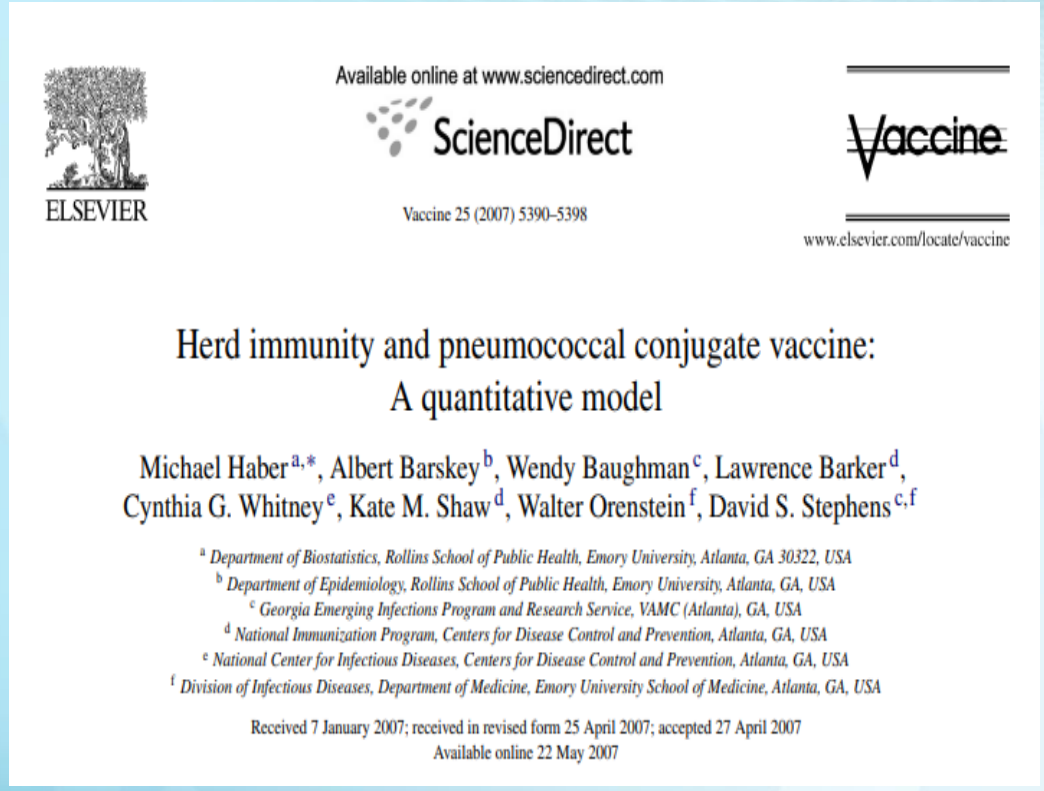
Ever Changing ACIP Guidelines



Two other Important Guideline Dates



Something Notable Occurred



ELSEVIER

Available online at www.sciencedirect.com

ScienceDirect

Vaccine 25 (2007) 5390–5398

Vaccine

www.elsevier.com/locate/vaccine

Herd immunity and pneumococcal conjugate vaccine: A quantitative model

Michael Haber[a,*], Albert Barskey[b], Wendy Baughman[c], Lawrence Barker[d], Cynthia G. Whitney[e], Kate M. Shaw[d], Walter Orenstein[f], David S. Stephens[c,f]

[a] Department of Biostatistics, Rollins School of Public Health, Emory University, Atlanta, GA 30322, USA
[b] Department of Epidemiology, Rollins School of Public Health, Emory University, Atlanta, GA, USA
[c] Georgia Emerging Infections Program and Research Service, VAMC (Atlanta), GA, USA
[d] National Immunization Program, Centers for Disease Control and Prevention, Atlanta, GA, USA
[e] National Center for Infectious Diseases, Centers for Disease Control and Prevention, Atlanta, GA, USA
[f] Division of Infectious Diseases, Department of Medicine, Emory University School of Medicine, Atlanta, GA, USA

Received 7 January 2007; received in revised form 25 April 2007; accepted 27 April 2007
Available online 22 May 2007

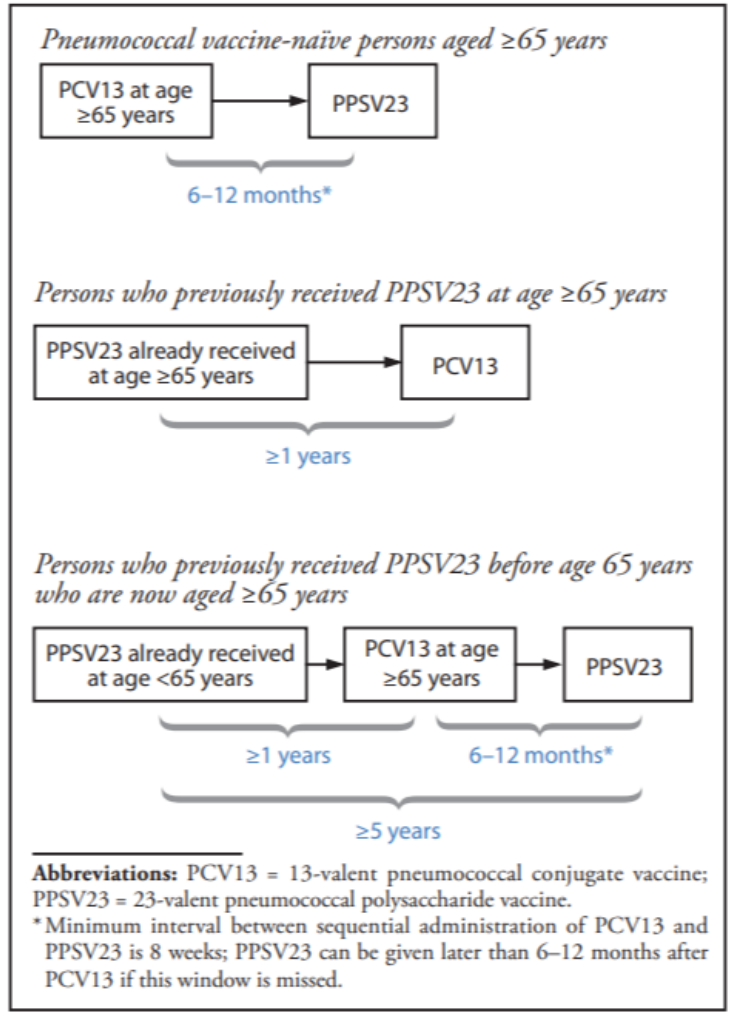
- Fulton and DeKalb Counties, GA
- "Highly significant declines in all the serotypes contained in PCV7 in all unvaccinated populations (5–19, 20–39, 40–64, and >64 years) from 2000 to 2003 were found under the model. No significant change in incidence was seen from 1994 to 1999, indicating rates were stable prior to vaccine introduction."

Haber, M., Barskey, A., Baughman, W., Barker, L., Whitney, C. G., Shaw, K. M., ... & Stephens, D. S. (2007). Herd immunity and pneumococcal conjugate vaccine: a quantitative model. *Vaccine*, *25*(29), 5390-5398.

2014 ACIP Recommendation

Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Weekly / Vol. 63 / No. 37
September 19, 2014

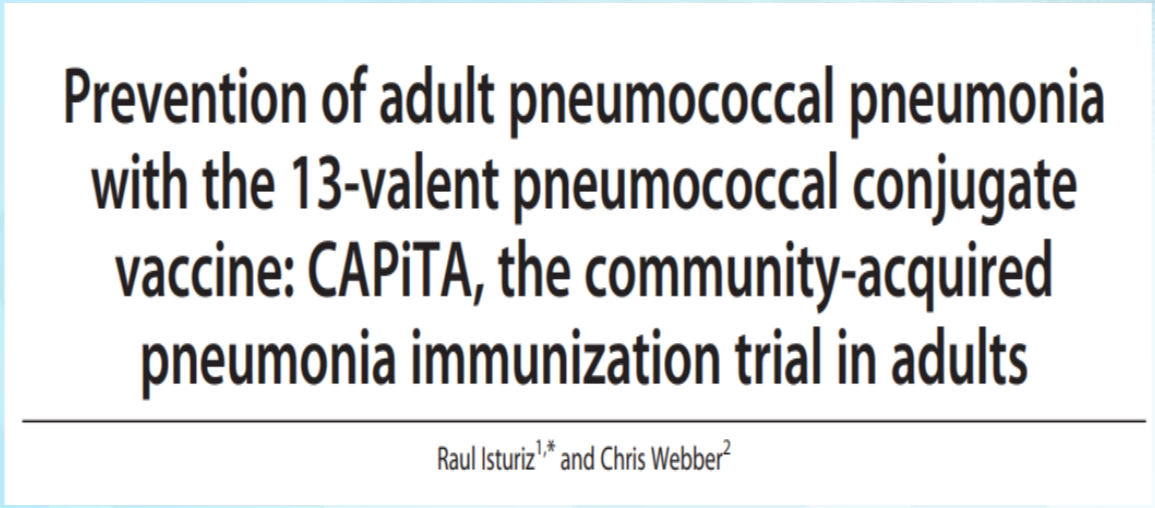
BOX. Sequential administration and recommended intervals for PCV13 and PPSV23 for adults aged ≥65 years — Advisory Committee on Immunization Practices, United States



Abbreviations: PCV13 = 13-valent pneumococcal conjugate vaccine; PPSV23 = 23-valent pneumococcal polysaccharide vaccine.

*Minimum interval between sequential administration of PCV13 and PPSV23 is 8 weeks; PPSV23 can be given later than 6–12 months after PCV13 if this window is missed.

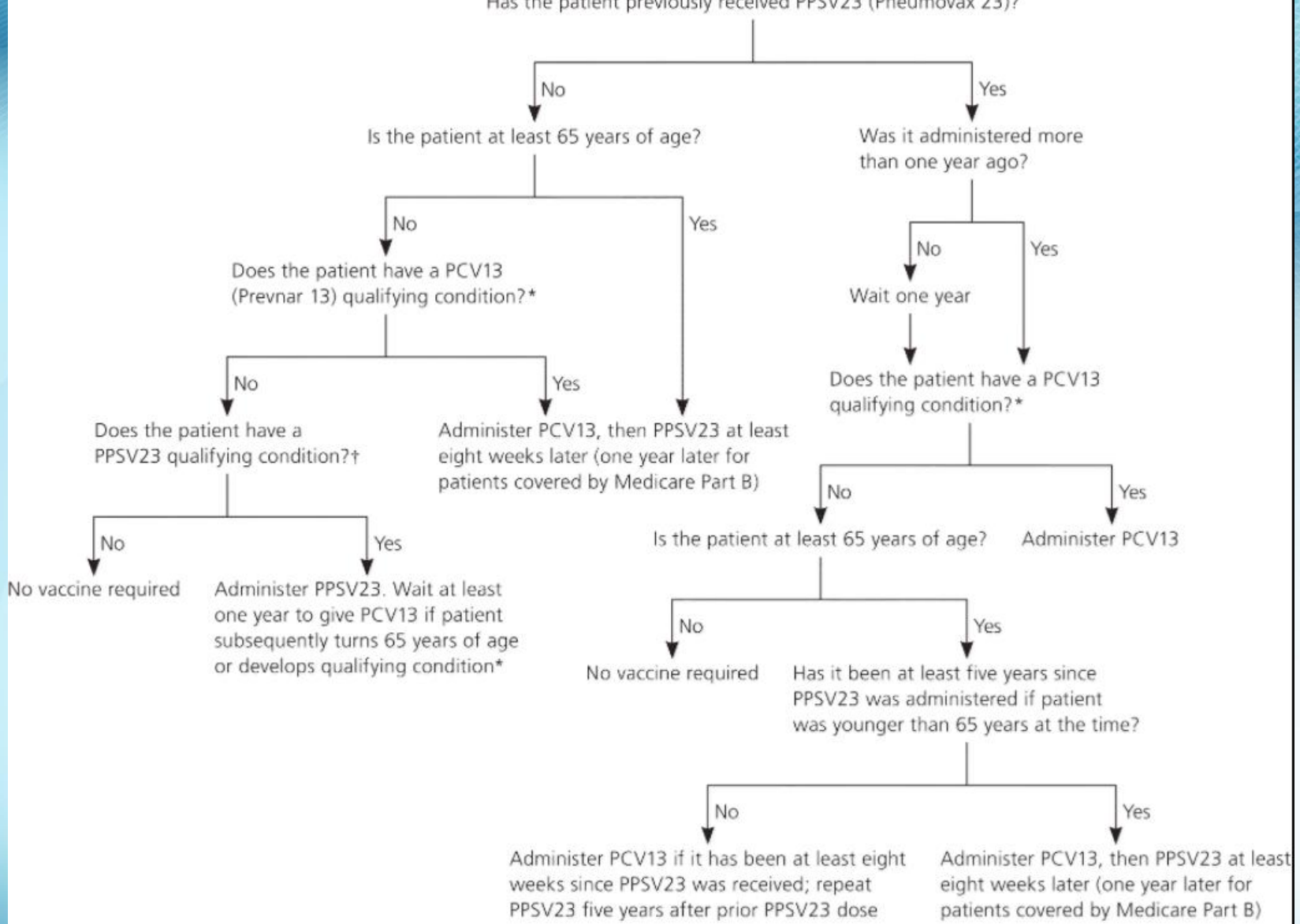
Basis for Change


Prevention of adult pneumococcal pneumonia with the 13-valent pneumococcal conjugate vaccine: CAPiTA, the community-acquired pneumonia immunization trial in adults

Raul Isturiz[1,*] and Chris Webber[2]

- Netherlands
- ~85,000 patients >age 65
- Randomized controlled trial
- PCV-13 vs placebo
- Findings:
  - 45.6% efficacy against pneumonia (p=0.0006)
  - 75% efficacy against IPD (p=0.0005)

Isturiz, R., & Webber, C. (2015). Prevention of adult pneumococcal pneumonia with the 13-valent pneumococcal conjugate vaccine: CAPiTA, the community-acquired pneumonia immunization trial in adults. *Human vaccines & immunotherapeutics*, *11*(7), 1825-1827.



*—High-risk patients in whom PCV13 is preferred include those with cochlear implants, chronic renal failure, congenital or acquired asplenia, congenital or acquired immunodeficiency, cerebrospinal fluid leak, generalized malignancy, human immunodeficiency virus infection, Hodgkin disease, leukemia, lymphoma, multiple myeloma, nephrotic syndrome, sickle cell disease, and solid organ transplant; and those receiving long-term corticosteroids or radiation therapy.

†—Patients with chronic illnesses in whom PPSV23 is preferred include those who smoke and those with alcoholism; diabetes mellitus or chronic heart, liver, or lung disease.

https://www.aafp.org/afp/2015/0915/p456.html

ORIGINAL RESEARCH

Primary Care Physicians' Struggle with Current Adult Pneumococcal Vaccine Recommendations

Laura P. Hurley, MD, MPH, Mandy A. Allison, MD, MSPH, Tamara Pilishvili, MPH, Sean T. O'Leary, MD, MPH, Lori A. Crane, PhD, MPH, Michaela Brtnikova, PhD, MPH, Brenda L. Beaty, MSPH, Megan C. Lindley, MPH, Carolyn B. Bridges, MD, and Allison Kempe, MD, MPH

Introduction: **In 2012, the Advisory Committee on Immunization Practices recommended 13-valent pneumococcal conjugate vaccine (PCV13) in series with 23-valent pneumococcal polysaccharide vaccine (PPSV23) for at-risk adults ≥19; in 2014, it expanded this recommendation to adults ≥65. Primary care physicians' practice, knowledge, attitudes, and beliefs regarding these recommendations are unknown.**

Methods: **Primary care physicians throughout the U.S. were surveyed by E-mail and post from December 2015 to January 2016.**

Results: **Response rate was 66% (617 of 935). Over 95% of respondents reported routinely assessing adults' vaccination status and recommending both vaccines. A majority found the current recommendations to be clear (50% "very clear," 38% "somewhat clear"). Twenty percent found the upfront cost of purchasing PCV13, lack of insurance coverage, inadequate reimbursement, and difficulty determining vaccination history to be "major barriers" to giving these vaccines. Knowledge of recommendations varied, with 83% identifying the PCV13 recommendation for adults ≥65 and only 21% identifying the recommended interval between PCV13 and PPSV23 in an individual <65 at increased risk.**

Conclusions: **Almost all surveyed physicians reported recommending both pneumococcal vaccines, but a disconnect seems to exist between perceived clarity and knowledge of the recommendations. Optimal implementation of these recommendations will require addressing knowledge gaps and reported barriers. (J Am Board Fam Med 2018;31:94–104.)**

Keywords: **Family Physicians, Insurance Coverage, Pneumococcal Vaccines, Primary Care Physicians, Vaccination**

Hurley, L. P., Allison, M. A., Pilishvili, T., O'Leary, S. T., Crane, L. A., Brtnikova, M., ... & Kempe, A. (2018). Primary care physicians' struggle with current adult pneumococcal vaccine recommendations. *The Journal of the American Board of Family Medicine*, *31*(1), 94-104.

2019 ACIP Recommendation

TABLE 1. Recommendations for 13-valent pneumococcal conjugate vaccine (PCV13) and 23-valent pneumococcal polysaccharide vaccine (PPSV23) among adults aged ≥19 years

Medical indication group	Specific underlying medical condition	PCV13 for persons aged ≥19 years	PPSV23* for persons aged 19–64 years	PCV13 for persons aged ≥65 years	PPSV23 for persons aged ≥65 years
None	None of the below	No recommendation	No recommendation	Based on shared clinical decision-making†	1 dose; if PCV13 has been given, then give PPSV23 ≥1 year after PCV13
Immunocompetent persons	Alcoholism Chronic heart disease§ Chronic liver disease Chronic lung disease¶ Cigarette smoking Diabetes mellitus	No recommendation	1 dose	Based on shared clinical decision-making†	1 dose; if PCV13 has been given, then give PPSV23 ≥1 year after PCV13 and ≥5 years after any PPSV23 at age <65 years
	Cochlear implant CSF leak	1 dose	1 dose ≥8 weeks after PCV13	1 dose if no previous PCV13 vaccination	1 dose ≥8 weeks after PCV13 and ≥5 years after any PPSV23 at <65 years
Immunocompromised persons	Congenital or acquired asplenia Sickle cell disease/other hemoglobinopathies Chronic renal failure Congenital or acquired immunodeficiencies** Generalized malignancy HIV infection Hodgkin disease Iatrogenic immunosuppression†† Leukemia Lymphoma Multiple myeloma Nephrotic syndrome Solid organ transplant	1 dose	2 doses, 1st dose ≥8 weeks after PCV13 and 2nd dose ≥5 years after first PPSV23 dose	1 dose if no previous PCV13 vaccination	1 dose ≥8 weeks after PCV13 and ≥5 years after any PPSV23 at <65 years

Abbreviations: CSF = cerebrospinal fluid; HIV = human immunodeficiency virus.

* Only refers to adults aged 19–64 years. All adults aged ≥65 years should receive 1 dose of PPSV23 ≥5 years after any previous PPSV23 dose, regardless of previous history of vaccination with pneumococcal vaccine. No additional doses of PPSV23 should be administered following the dose administered at age ≥65 years.

† Recommendations that changed in 2019.

§ Includes congestive heart failure and cardiomyopathies.

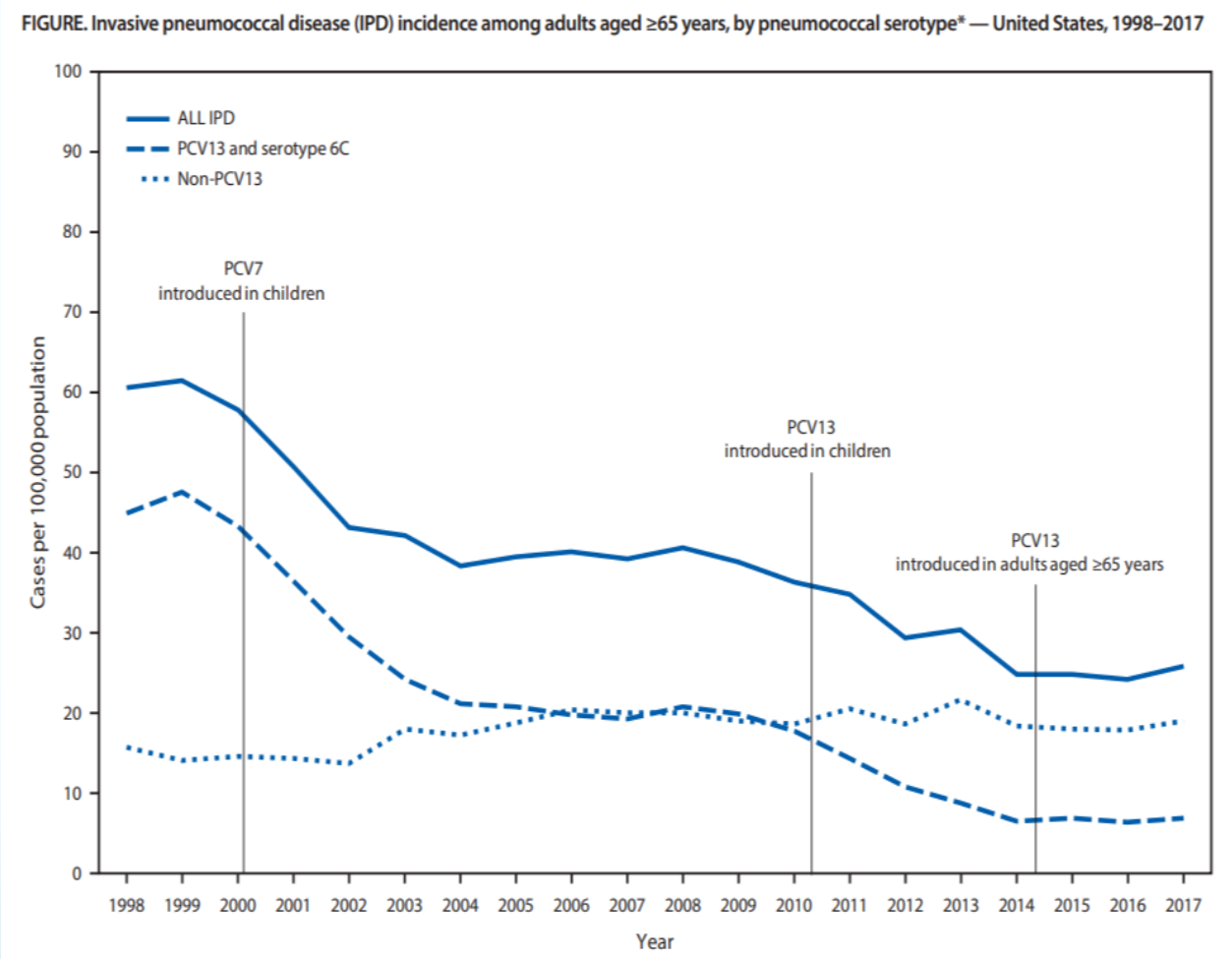
¶ Includes chronic obstructive pulmonary disease, emphysema, and asthma.

** Includes B- (humoral) or T-lymphocyte deficiency, complement deficiencies (particularly C1, C2, C3, and C4 deficiencies), and phagocytic disorders (excluding chronic granulomatous disease).

†† Diseases requiring treatment with immunosuppressive drugs, including long-term systemic corticosteroids and radiation therapy.

Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Weekly / Vol. 68 / No. 46
November 22, 2019

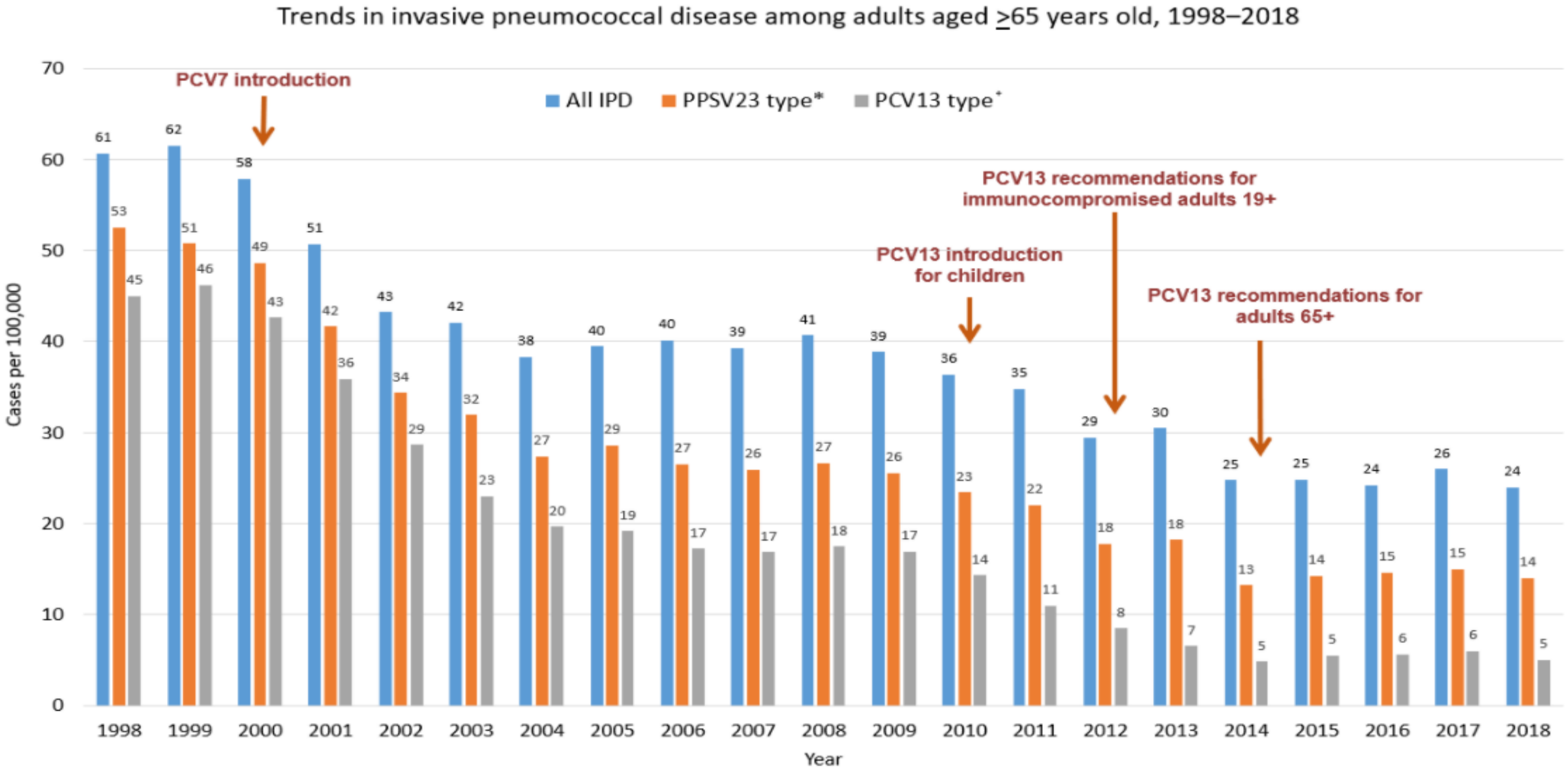
Why the Change?



MMWR 11/22/2019

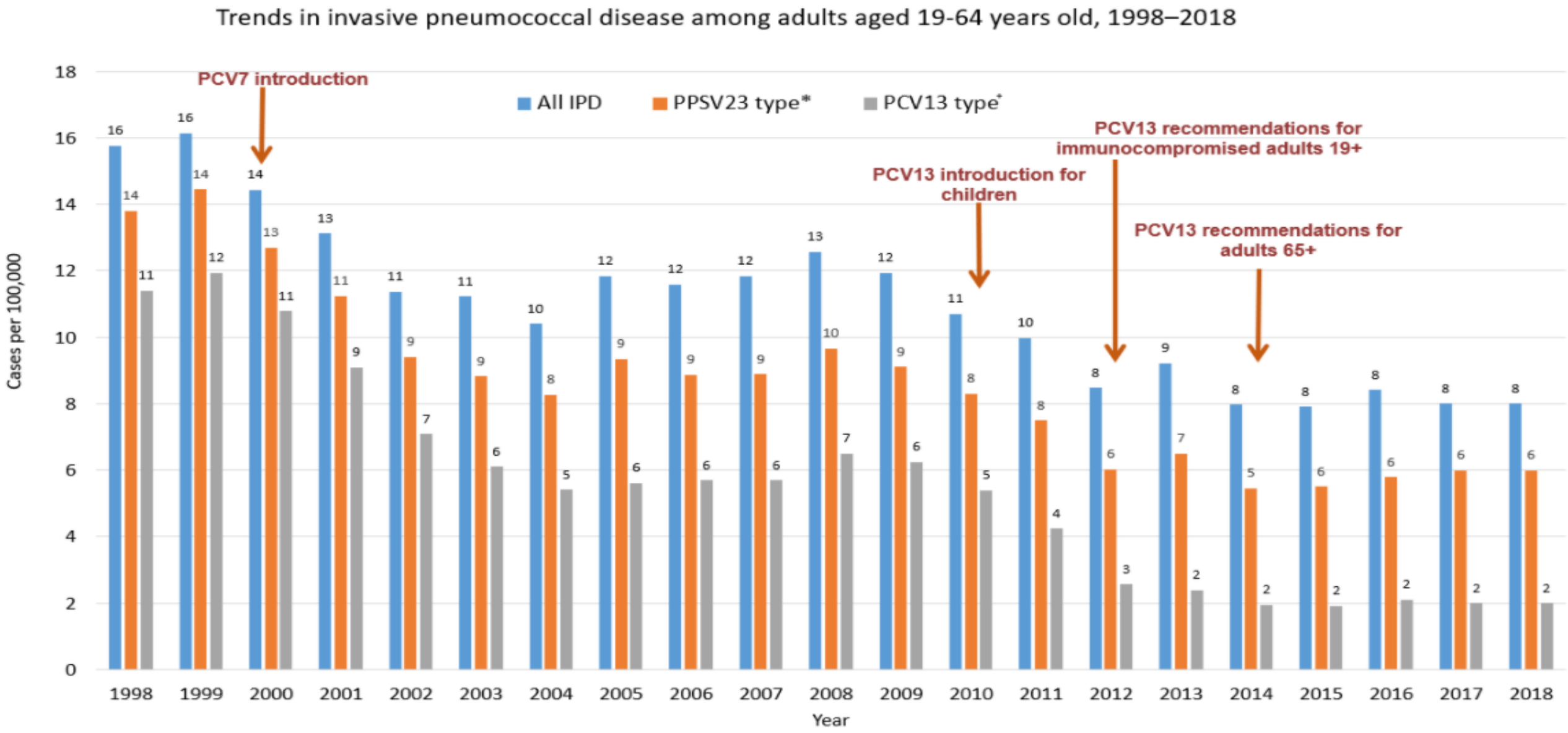
- From 2014–2017, no further reduction in PCV13-type IPD incidence was observed among adults aged ≥65 years with the incidence stable at five per 100,000 population.
- With this low prevalence, the numbers needed to vaccinate to prevent illness are 2,600 for pneumonia and more than 26,000 for invasive pneumococcal disease
- The cost per quality-adjusted life-year exceeds $200,000 and may be as high as $560,000.

Shah, A. A., Wallace, M. R., & Fields, H. (2020). Shared decision-making for administering PCV13 in older adults. *American family physician*, *101*(3), 134-135.



*PPSV23 serotypes: 1, 2, 3, 4, 5, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19A, 19F, 20, 22F, 23F, and 33F
*PCV13 serotype: 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, and 23F

https://www.cdc.gov/pneumococcal/surveillance.



*PPSV23 serotypes: 1, 2, 3, 4, 5, 6B, 7F, 8, 9N, 9V, 10A, 11A, 12F, 14, 15B, 17F, 18C, 19A, 19F, 20, 22F, 23F, and 33F
*PCV13 serotype: 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, and 23F

https://www.cdc.gov/pneumococcal/surveillance

2021 ACIP Recommendation

Table 3. ACIP Pneumococcal Vaccine Recommendations for Adults

Patient Population	Old Recommendations[1] (2019)	New Recommendations[2-4] (2021)
≥65 years old	▶ PPSV23[5] OR ▶ PCV13, followed by PPSV23[5]	▶ PCV20 OR ▶ PCV15, followed by PPSV23[6]
19-64 years old with CSF leak or cochlear implant	▶ PCV13, followed by 1 dose PPSV23[7]	▶ PCV20
19-64 years old with immunocompromising conditions[8]	▶ PCV13, followed by 2 doses PPSV23[9]	OR
19-64 years old; smoker or chronic medical conditions[10]	▶ PPSV23 (1 dose)	▶ PCV15, followed by PPSV23[6]

PCV13 = 13-valent conjugate vaccine *(Prevnar 13)*; PCV15 = 15-valent conjugate vaccine *(Vaxneuvance)*; PCV20 = 20-valent conjugate vaccine *(Prevnar 20)*; PPSV23 = 23-valent polysaccharide vaccine *(Pneumovax 23)*

1. ACIP. Pneumococcal ACIP vaccine recommendations. Available at: https://bit.ly/3bGhEUW. Accessed November 10, 2021.
2. For persons who have not previously received a pneumococcal conjugate vaccine or whose previous vaccination history is unknown.
3. M Kobayashi. Considerations for age-based and risk-based use of PCV15 and PCV20 among U.S. adults and proposed policy options. ACIP Meeting. October 20, 2021. Available at: https://bit.ly/2YhkaOi. Accessed November 10, 2021.
4. The Advisory Committee on Immunization Practices (ACIP) has voted in favor of these recommendations. These recommendations have not yet been approved by the CDC.
5. If a dose of PPSV23 was given before age 65, one final dose of the vaccine should be given at age 65 or older and at least 5 years after the prior dose. PPSV23 should be given at least one year after PCV13.
6. No interval specified to date by the CDC.
7. PPSV23 should be given at least 8 weeks after PCV13.
8. Immunocompromising conditions include chronic renal failure or nephrotic syndrome, immunodeficiency, iatrogenic immunosuppression, generalized malignancy, HIV, Hodgkin disease, leukemia, lymphoma, multiple myeloma, solid organ transplants, congenital or acquired asplenia, sickle cell disease and other hemoglobinopathies.
9. The first dose of PPSV23 should be given ≥8 weeks after PCV13 and the second ≥5 years after the first PPSV23 dose.
10. Chronic medical conditions include alcohol use disorder, chronic heart, liver, or lung disease, and diabetes mellitus.

Centers for Disease Control and Prevention
MMWR
Morbidity and Mortality Weekly Report
Weekly / Vol. 71 / No. 4
January 28, 2022

https://secure.medicalletter.org/TML-article-1638c

Expected Benefits

- Use of PCV20 alone or PCV15 in series with PPSV23 is expected to reduce pneumococcal disease incidence in adults aged ≥65 years and in those aged 19–64 years with certain underlying conditions.
- Findings from studies suggested that the immunogenicity and safety of PCV20 alone or PCV15 in series with PPSV23 were comparable to PCV13 alone or PCV13 in series with PPSV23.
- Cost-effectiveness studies demonstrated that use of PCV20 alone or PCV15 in series with PPSV23 for adults at age 65 years was cost-saving.
- **The new policy simplifies adult pneumococcal vaccine recommendations and is expected to improve vaccine coverage among adults and prevent more pneumococcal disease**

Additional Serotype Analysis

From 2018– 2019 surveillance data:

- IPD >65 yo:
  - PCV13 serotypes accounted for 27% of cases
  - Serotypes unique to PCV15 accounted for 15% of cases
  - Serotypes unique to PCV 20 accounted for 27% of cases
  - Serotypes unique to PPSV23 accounted for 35% of cases
- IPD aged 19–64 years (with certain underlying conditions)
  - PCV13 serotypes accounted for 30% of IPD
  - Serotypes unique to PCV15 accounted for 13% of cases
  - Serotypes unique to PCV 20 accounted for 28% of cases
  - Serotypes unique to PPSV23 accounted for 43% of cases

Cost Effectiveness

PCV 20 at age ≥65

- 3 economic models demonstrated:
- Range from overall cost savings to $39,000 per QALY

PCV 15 +PPSV 23 at age ≥ 65

- 3 economic models demonstrated:
- Range from overall cost savings to $282,000 per QALY

MMWR 1/28/22

CURRENT STATE

Healthy People 2020 Goals

- Increase 65+ ever received pneumonia vaccine to >90%
  - From baseline 60% in 2008

- Increase high risk 18-64 vaccinated against pneumococcal disease to 60%
  - From baseline 16.6%

https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives

"Despite progress, approximately 42,000 adults and 300 children in the United States die each year from vaccine-preventable diseases. Communities with pockets of unvaccinated and undervaccinated populations are at increased risk for outbreaks of vaccine-preventable diseases."

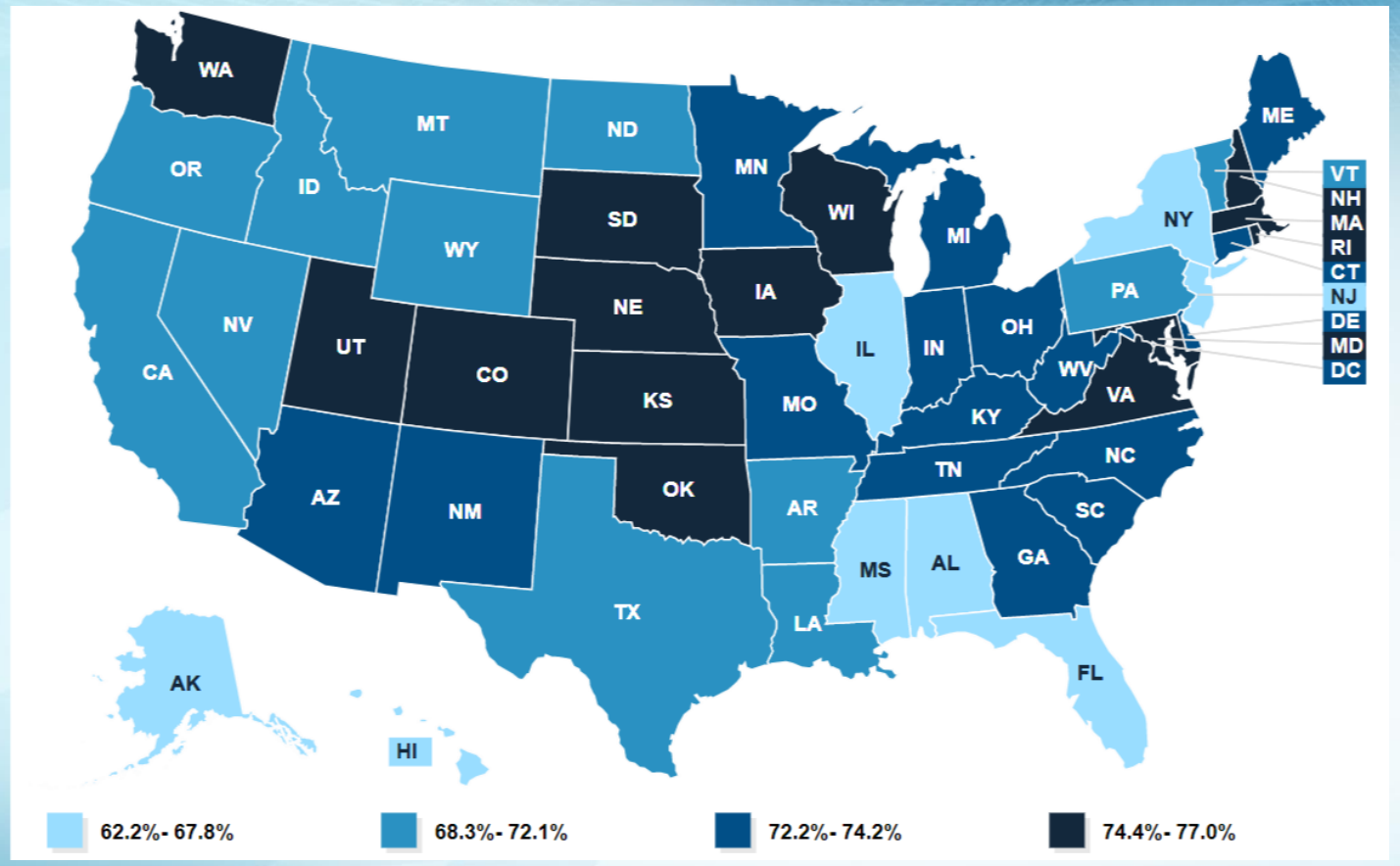
https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases

Pneumonia Vaccine rates By Race/Ethnicity 2020

Location	White	Black	Hispanic	Asian/ Native Hawaiian or Pacific Islander	American Indian/ Alaska Native	Other
United States [1]	73.8%	60.4%	57.1%	70.0%	63.4%	62.9%

https://www.kff.org/other/state-indicator/adults-aged-65-and-over-who-report-ever-having-a-pneumonia-vaccine-by-race-ethnicity

2020 Overall Pneumococcal Vaccine Rates



https://www.kff.org/other/state-indicator/adults-age-65-plus-who-report-ever-having-a-pneumonia-vaccine-by-sex

THE GERONTOLOGICAL SOCIETY OF AMERICA®

The Gerontologist
cite as: *Gerontologist*, 2018, Vol. 58, No. 4, e205–e217
doi:10.1093/geront/gnw193
Advance Access publication January 21, 2017

OXFORD

Literature Review

Racial/Ethnic Disparities in Influenza and Pneumococcal Vaccinations Among Nursing Home Residents: A Systematic Review

Jasmine L. Travers, PhD, RN,[1,*] Krista L. Schroeder, PhD, RN,[2] Thomas E. Blaylock, PhD,[3] and Patricia W. Stone, PhD, FAAN[4]

[1]NewCourtland Center for Transitions and Health, University of Pennsylvania School of Nursing, Philadelphia. [2]University of Pennsylvania School of Nursing, Philadelphia. [3]Department of Health Policy and Management, Columbia University Mailman School of Public Health, New York, New York. [4]Center for Health Policy, Columbia University School of Nursing, New York, New York.

*Address correspondence to Jasmine L. Travers, PhD, RN, NewCourtland Center for Transitions and Health, University of Pennsylvania School of Nursing, 418 Curie Blvd, Philadelphia, PA 19104. E-mail: jatr@nursing.upenn.edu

Received June 22, 2016; Editorial Decision date September 12, 2016

Decision Editor: Rachel Pruchno, PhD

Abstract

This systematic review analyzes research examining racial/ethnic disparities in influenza and pneumococcal vaccination coverage between White and racial/ethnic minority (Black and Hispanic) nursing home residents. A review of the literature for years 1966–2014 using Medline, Web of Science, and PubMed was conducted. The Epidemiological Appraisal Instrument was used to appraise the quality of the 13 included studies. Overall, articles were strong in reporting and data analysis, but weak in sample selection and measurement quality. Disparities between vaccination coverage among racial/ethnic minorities versus Whites ranged from 2% to 20% for influenza and 6% to 15% for pneumococcal vaccination. Researchers reported racial/ethnic minorities were more likely to refuse vaccinations and less likely to have vaccinations offered and their vaccination status tracked compared to Whites. Policies/strategies that focus on ensuring racial/ethnic minorities are offered influenza and pneumococcal vaccinations and their vaccination status are tracked in nursing homes are warranted. Updated evaluation on vaccination disparities is also needed.

Keywords: Vaccines, Health disparities, Long-term care, Immunization, Policy

Travers, J. L., Schroeder, K. L., Blaylock, T. E., & Stone, P. W. (2018). Racial/ethnic disparities in influenza and pneumococcal vaccinations among nursing home residents: A systematic review. *The Gerontologist*, *58*(4), e205-e217.

HUMAN VACCINES & IMMUNOTHERAPEUTICS
2019, VOL. 15, NO. 4, 841–849
https://doi.org/10.1080/21645515.2018.1564434

Taylor & Francis
Taylor & Francis Group

RESEARCH PAPER

OPEN ACCESS Check for updates

Disparities in uptake of 13-valent pneumococcal conjugate vaccine among older adults in the United States

John M. McLaughlin[a], David L. Swerdlow[a], Farid Khan[a], Oliver Will[b], Aaron Curry[a], Vincenza Snow[a], Raul E. Isturiz[a], and Luis Jodar[a]

[a]Pfizer Vaccines, Collegeville, PA, USA; [b]IQVIA, Plymouth Meeting, PA, USA

ABSTRACT

Background: In September 2014, 13-valent pneumococcal conjugate vaccine (PCV13) was universally recommended for all US adults aged ≥65 years. Adult PCV13 coverage, including whether disparities in uptake exist, however, is not well-described.

Methods: We used a monthly series of cross-sectional analyses of administrative medical and prescription claims data collected by IQVIA and linked to sociodemographic data collected by Experian to estimate overall and subpopulation-level uptake of PCV13 among US adults aged ≥65 years.

Results: Among adults aged ≥65 years, 43.3% received PCV13 by the end of November 2017. Race/ethnicity, annual household income, education status, and neighborhood urbanicity were strongly related to PCV13 uptake among adults aged ≥65 years. Lower uptake of PCV13 was observed for non-Hispanic black (36.3%) and Hispanic (30.0%) adults (*vs* 45.6% for non-Hispanic whites, $P < .01$), the poor (30.7% *vs* 54.2% among lowest *vs* highest income deciles, $P < .01$), adults with low educational status (33.0% *vs* 49.0% among those without high school education *vs* college educated, $P < .01$), and those living in rural communities (22.9%) or urban/inner-city (33.8%) areas (*vs* 45.8% in suburban areas, $P < .01$).

Conclusions: PCV13 uptake among adults aged ≥65 occurred rapidly in the three years after universal recommendation in September 2014. Yet, poor and minority communities, rural and urban/inner-city areas, and communities with low educational attainment had substantially lower PCV13 coverage. These same populations are at increased risk of pneumococcal disease. In order to maximize the benefits of pneumococcal vaccination, further targeted and tailored interventions to increase PCV13 uptake in these underserved populations are still necessary.

ARTICLE HISTORY
Received 6 September 2018
Revised 4 December 2018
Accepted 18 December 2018

KEYWORDS
Disparities; pneumococcal vaccination; 13-valent pneumococcal conjugate vaccine (PCV13); race/ethnicity; socioeconomic status (SES)

McLaughlin, J. M., Swerdlow, D. L., Khan, F., Will, O., Curry, A., Snow, V., ... & Jodar, L. (2019). Disparities in uptake of 13-valent pneumococcal conjugate vaccine among older adults in the United States. *Human Vaccines & Immunotherapeutics*, *15* (4), 841-849.

Marked Reduction of Socioeconomic and Racial Disparities in Invasive Pneumococcal Disease Associated With Conjugate Pneumococcal Vaccines

Rameela Raman,[1] Julia Brennan,[2,3] Danielle Ndi,[1] Chantel Sloan,[4] Tiffanie M. Markus,[1] William Schaffner,[1] and H. Keipp Talbot[1]

[1]Vanderbilt University Medical Center, Nashville, Tennessee, USA, [2]Epidemic Intelligence Service, Division of Scientific Education and Professional Development, Centers for Disease Control and Prevention, Atlanta, Georgia, USA, [3]Tennessee Department of Health, Nashville, Tennessee, USA, and [4]Brigham Young University, Provo, Utah, USA

Background. It is not known whether reductions in socioeconomic and racial disparities in incidence of invasive pneumococcal disease (defined as the isolation of *Streptococcus pneumoniae* from a normally sterile body site) noted after pneumococcal conjugate vaccine (PCV) introduction have been sustained.

Methods. Individual-level data collected from 20 Tennessee counties participating in Active Bacterial Core surveillance over 19 years were linked to neighborhood-level socioeconomic factors. Incidence rates were analyzed across 3 periods—pre–7-valent PCV (pre-PCV7; 1998–1999), pre–13-valent PCV (pre-PCV13; 2001–2009), and post-PCV13 (2011–2016)—by socioeconomic factors.

Results. A total of 8491 cases of invasive pneumococcal disease were identified. Incidence for invasive pneumococcal disease decreased from 22.9 (1998–1999) to 17.9 (2001–2009) to 12.7 (2011–2016) cases per 100 000 person-years. Post-PCV13 incidence (95% confidence interval [CI]) of PCV13-serotype disease in high- and low-poverty neighborhoods was 3.1 (2.7–3.5) and 1.4 (1.0–1.8), respectively, compared with pre-PCV7 incidence of 17.8 (15.7–19.9) and 6.4 (4.9–7.9). Before PCV introduction, incidence (95% CI) of PCV13-serotype disease was higher in blacks than whites (17.3 [15.1–19.5] vs 11.8 [10.6–13.0], respectively); after introduction, PCV13-type disease incidence was greatly reduced in both groups (white: 2.7 [2.4–3.0]; black: 2.2 [1.8–2.6]).

Conclusions. Introduction of PCV13 was associated with substantial reductions in overall incidence and socioeconomic and racial disparities in PCV13-serotype incidence.

Keywords. invasive pneumococcal disease; socioeconomic determinants; census tract–based determinants; disparities; PCV13; vaccines; geocoding.

Raman, R., Brennan, J., Ndi, D., Sloan, C., Markus, T. M., Schaffner, W., & Talbot, H. K. (2021). Marked reduction of socioeconomic and racial disparities in invasive pneumococcal disease associated with conjugate pneumococcal vaccines. *The Journal of Infectious Diseases*, *223*(7), 1250-1259.

PRACTICAL ADVICE

PMA Adult Immunization Collaborative Experience

Vaccine	Baseline as of 12/31/16	Improvement as of 3/31/17
Influenza Age 19 and Up	60.9%	67.0%
Elderly Pneumonia Vaccine (>65)	92.3%	93.4%
High Risk Pneumonia Vaccine (Age 19-64)	36.9%	43.9%
At Risk Pneumonia Vaccine (Age 19-64)	54.7%	61.2%

PMA Adult Immunization Collaborative Experience/Insights

Table 1

Premier conducted three outreach campaigns with Optum One and Emmi solutions. The electronic medical record was used to identify populations across all 3 populations:

- Patients > 65 years old,
- Patients 19 – 64 with at least 1 high risk condition, and
- Patients 19 – 64 years of age with at least one at risk condition.

The patients were uploaded into Optum One for outreach and result tracking.

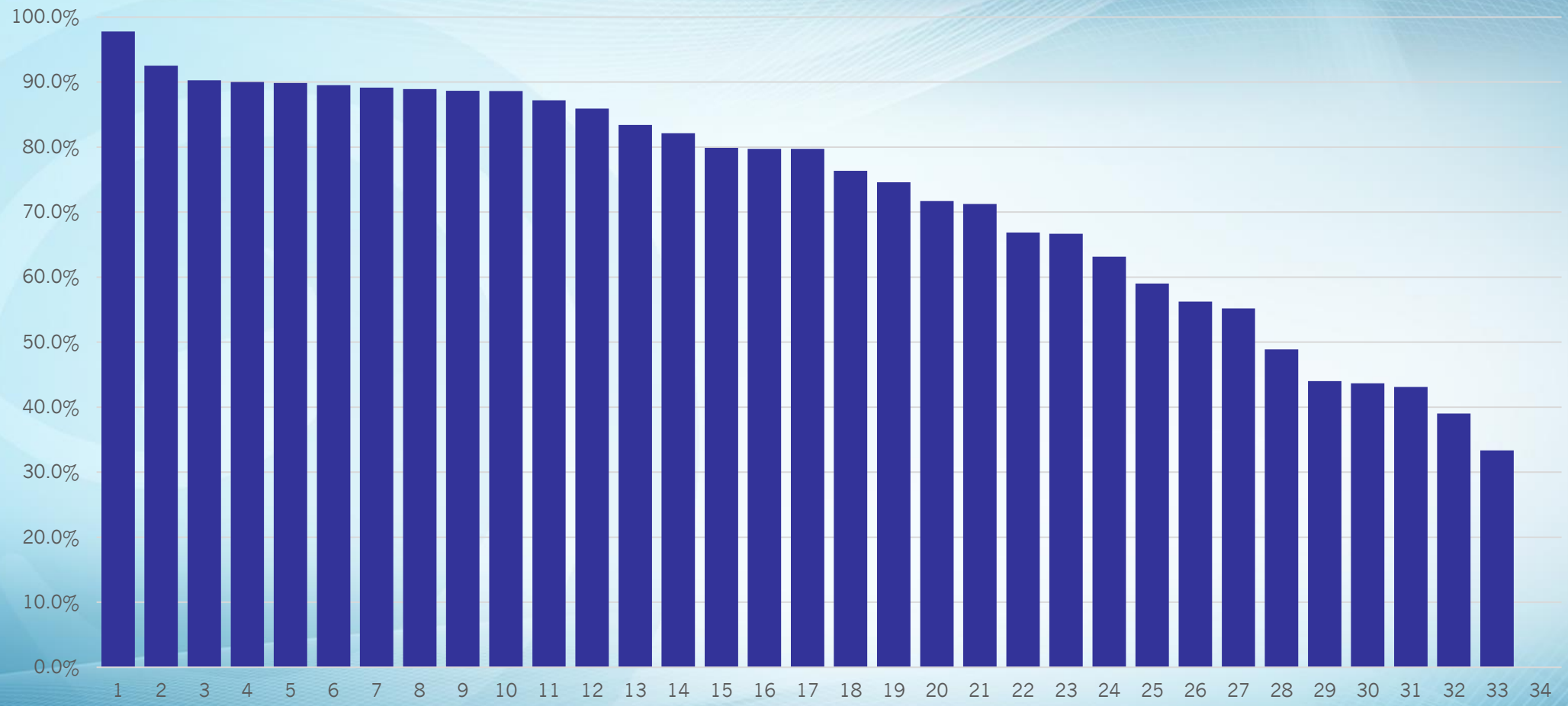
Calls were customized to identify the call as coming from Premier, and to announce the name of the patient's PCP. Once connected, patients were told that a pneumonia vaccine was due, and given education about the importance of vaccination. The patient could then elect a soft transfer to schedule an appointment, make a note of provider contact information to schedule at a later date, or state that the vaccination had been received.

Population	# Patients Identified	# Engaged	% Engaged	Engaged Patients Vaccinated	% Engaged Patients Vaccinated
65+, needing one or more	1,295	524	40.5%	215	41%
19 – 64 high risk needing one or more	840	592	70.5%	112	18.9%
19 – 64 at risk ONLY needing one or more	5,702	2676	46%	935	34.9%

PMA Performance Over Time on Pneumonia Vaccine Measure

12/31/17 (end of AI 2):95.1%
2/28/21 (current with PPSV-23 indication): 82.7%
2/28/21 (current with conjugate vaccine recommendation):49.7%

Current Variation in Pneumonia Vaccine Performance by Provider Panel-PMA

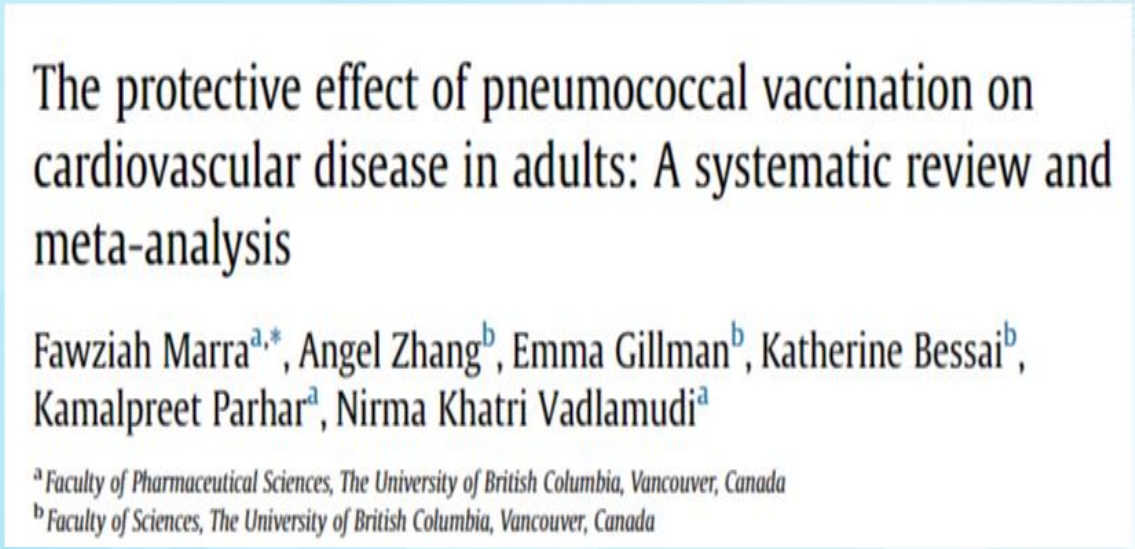


Health Equity Focus at PMA: Bundle Performance

Race-Q2020 Data	*Numerator*	*Denominator*	*Percentage*
American Indian or Alaska Native	0	1	0.00%
Asian	27	67	40.30%
Black or african american	205	724	28.31%
Native hawaiian or other pacific islander	2	7	28.57%
Not recorded	1	41	2.44%
Unknown race	32	151	21.19%
White or caucasian	4626	10709	43.20%

OTHER INSIGHTS/WRAP UP

CV Benefits



The protective effect of pneumococcal vaccination on cardiovascular disease in adults: A systematic review and meta-analysis

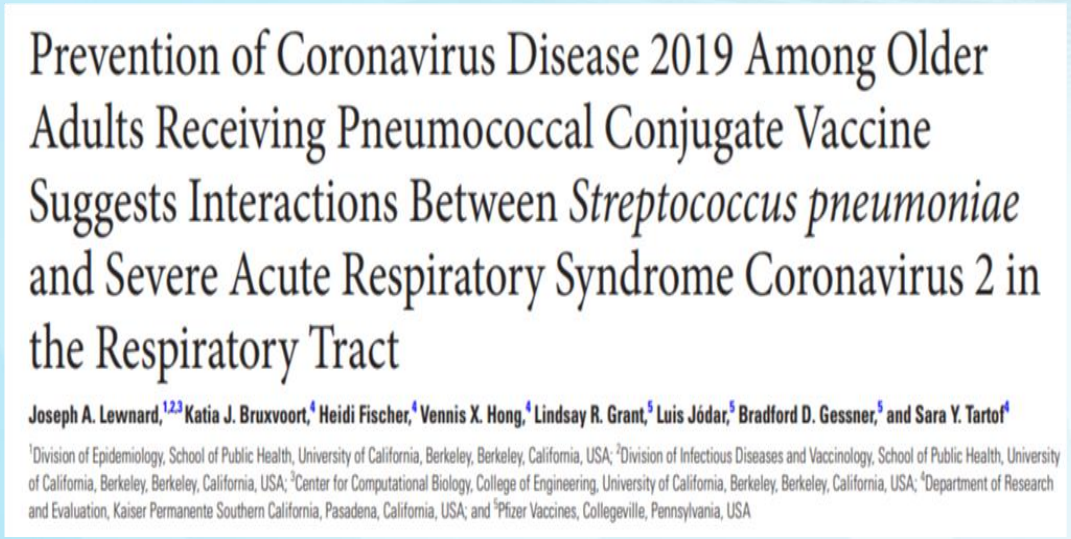
Fawziah Marra[a,*], Angel Zhang[b], Emma Gillman[b], Katherine Bessai[b], Kamalpreet Parhar[a], Nirma Khatri Vadlamudi[a]

[a] Faculty of Pharmaceutical Sciences, The University of British Columbia, Vancouver, Canada
[b] Faculty of Sciences, The University of British Columbia, Vancouver, Canada

- Meta analysis of 18 studies
- >700,000 patients who received PPSV
- Decreased CV risk (RR 0.91, CI 0.84-0.99
- Decreased risk of MI (RR 0.88, CI 0.79-0.98)
- Reduction in all cause mortality (RR 0.78, CI 0.68-0.88)
- Most significant effects if >65 years

Marra, F., Zhang, A., Gillman, E., Bessai, K., Parhar, K., & Vadlamudi, N. K. (2020). The protective effect of pneumococcal vaccination on cardiovascular disease in adults: A systematic review and meta-analysis. *International Journal of Infectious Diseases*, *99*, 204-213.

COVID-19 Benefits?



Prevention of Coronavirus Disease 2019 Among Older Adults Receiving Pneumococcal Conjugate Vaccine Suggests Interactions Between *Streptococcus pneumoniae* and Severe Acute Respiratory Syndrome Coronavirus 2 in the Respiratory Tract

Joseph A. Lewnard,[1,2,3] Katia J. Bruxvoort,[4] Heidi Fischer,[4] Vennis X. Hong,[4] Lindsay R. Grant,[5] Luis Jódar,[5] Bradford D. Gessner,[5] and Sara Y. Tartof[4]

[1]Division of Epidemiology, School of Public Health, University of California, Berkeley, Berkeley, California, USA; [2]Division of Infectious Diseases and Vaccinology, School of Public Health, University of California, Berkeley, Berkeley, California, USA; [3]Center for Computational Biology, College of Engineering, University of California, Berkeley, Berkeley, California, USA; [4]Department of Research and Evaluation, Kaiser Permanente Southern California, Pasadena, California, USA; and [5]Pfizer Vaccines, Collegeville, Pennsylvania, USA

Lewnard, J. A., Bruxvoort, K. J., Fischer, H., Hong, V. X., Grant, L. R., Jódar, L., ... & Tartof, S. Y. (2021). Prevention of Coronavirus Disease 2019 Among Older Adults Receiving Pneumococcal Conjugate Vaccine Suggests Interactions Between Streptococcus pneumoniae and Severe Acute Respiratory Syndrome Coronavirus 2 in the Respiratory Tract. *The Journal of Infectious Diseases*

"Kaiser Permanente members who received the PCV13 vaccine appeared to be diagnosed with COVID-19 less often, and when they were, they seemed to have less severe outcomes, overall," said the senior author, Sara Y. Tartoff PhD, MPH, a scientist with the Kaiser Permanente Southern California Department of Research & Evaluation. "One of the most interesting aspects of our findings was that the patients who received PCV13 received some protection against COVID-19, while those who received PPSV23, another pneumococcal vaccine, did not."

https://about.kaiserpermanente.org/our-story/health-research/news/pneumonia-vaccine-may-affect-course-of-covid-19

Call To Action

National Adult and Influenza Immunization Summit

https://www.izsummitpartners.org/call-to-action-adult-immunizations/

Call to Action

Given the tremendous health benefits of adult vaccinations and low rates of adult vaccination, made worse by the COVID-19 pandemic, the National Adult and Influenza Immunization Summit (NAIIS) members call on providers across the healthcare spectrum to take actions to improve routine vaccination of adults.

Specifically, NAIIS calls on all clinicians and other healthcare providers, such as pharmacists, occupational health, and clinical subspecialists, to follow the National Vaccine Advisory Committee (NVAC) Standards for Adult Immunization Practice including:

- Assess the vaccination status of patients at all clinical encounters, even among clinicians and other providers who do not stock vaccines.
  - Utilize a jurisdiction's immunization information system (IIS) to view patients' prior vaccinations to support vaccine needs assessment.
- Identify vaccines patients need, then clearly recommend needed vaccines.
- Offer needed vaccines or refer patients to another provider for vaccination.
- Document vaccinations given, including in the jurisdiction's IIS.
  - Many electronic health record (EHR) systems already link to jurisdiction's IIS – providers should check with their EHR administrators.
  - Providers not already utilizing an IIS should contact their local or state immunization programs to inquire about enrolling in their jurisdiction's IIS.
- Measure vaccination rates of providers' patient panels; make changes to clinic patient flow and take other steps to address barriers to patient vaccination.

Missed Opportunities

- **Effective Vaccine Delivery Programs are needed**
  - Clinicians' offices
    - Especially those who patients who frequently visit physicians
  - At hospital discharge
    - 65% of patients admitted with severe pneumococcal disease had other admits in the prior 5 years
  - SNFs and other long term care facilities

https://www.cdc.gov/pneumococcal/clinicians/clinical-features.html

Healthy People 2030 Goals

Increase the proportion of adults age 19 years or older who get recommended vaccines — IID-D03

Objective Overview

Add to Custom List

Status: Developmental

Learn more about our data release schedule

Increase the proportion of adults age 19 years or older who receive recommended age-appropriate vaccines

Summary

This objective currently has developmental status, meaning it is a high-priority public health issue that has evidence-based interventions to address it, but doesn't yet have reliable baseline data. Once baseline data are available, this objective may be considered to become a core Healthy People 2030 objective.

Healthy People 2030 Goals

Reduce the rate of hospital admissions for pneumonia among older adults — OA-06

Status: Baseline only

Learn more about our data release schedule

Most Recent Data:
713.9 hospital admissions for pneumonia per 100,000 adults (2016)

Target:
642.5 per 100,000

Desired Direction:
Decrease desired

Baseline:
713.9 hospital admissions for pneumonia per 100,000 adults aged 65 years and over occurred in 2016

Measurement Changes

Current state(for baseline measures submitted):

- Any pneumococcal vaccine by age 66

Future state(starting with July 1, 2022 reporting):

- Any conjugate vaccine will count for numerator compliance
  - Prior PCV-13 are compliant
    - But should get PPSV-23 1 year after PCV-13
  - If receive PCV-20 will be considered compliant
  - If PCV 15 will need PPSV-23 1 year later to be considered compliant

Final Thought

"Osler died in December 1919 of lung abscess and empyema which were complications of the pneumonia he contracted after an exhausting and bitterly cold two-day motor drive from Newcastle to Oxford, necessitated by a rail strike...To a friend he had earlier referred to 'enjoying one of my recurring attacks of bronchitis', and that he had 'carried the pneumococcus for a great many years'"

Wrong, O. (2003). Osler and my father. *Journal of the Royal Society of Medicine*, *96*(9), 462-464.

Pneumococcal Measure Update

Updated CDC Guidelines

Adults aged >65 years who have not previously received PCV or whose previous vaccination history is unknown should receive 1 dose of PCV (either PCV20 or PCV15). When PCV15 is used, it should be followed by a dose of PPSV23.

- **Adults who have only received PPSV23**
  - May receive a PCV (either PCV20 or PCV15) ≥1 year after their last PPSV23 dose. When PCV15 is used in those with history of PPSV23 receipt, it need not be followed by another dose of PPSV23
- **Adults who received PCV13**
  - The incremental public health benefits of providing PCV15 or PCV20 to adults who have received PCV13 only or both PCV13 and PPSV23 have not been evaluated. These adults should complete the previously recommended PPSV23 series
- **Adults who 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

Source: MMWR article "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."

Impact on RIZE Measures

- **Current Measure 2 (Pneumococcal):**

  Number of denominator patients who were administered a pneumococcal vaccination any time during the Measurement Year or are documented as up-to-date on their pneumococcal vaccination

Impact on RIZE Measures

- **Measure 2 (Pneumococcal) will be changed to:**

  Number of denominator patients who were administered any conjugate pneumococcal vaccine during the Measurement Year or are documented as up-to-date on their pneumococcal vaccination

- **Any conjugate =**
  - PCV20, OR
  - PCV15 (regardless of PPSV23) ,OR
  - PCV13* (regardless of PPSV23)

**PCV13 will count for previously vaccinated patients (Numerator Part B)*

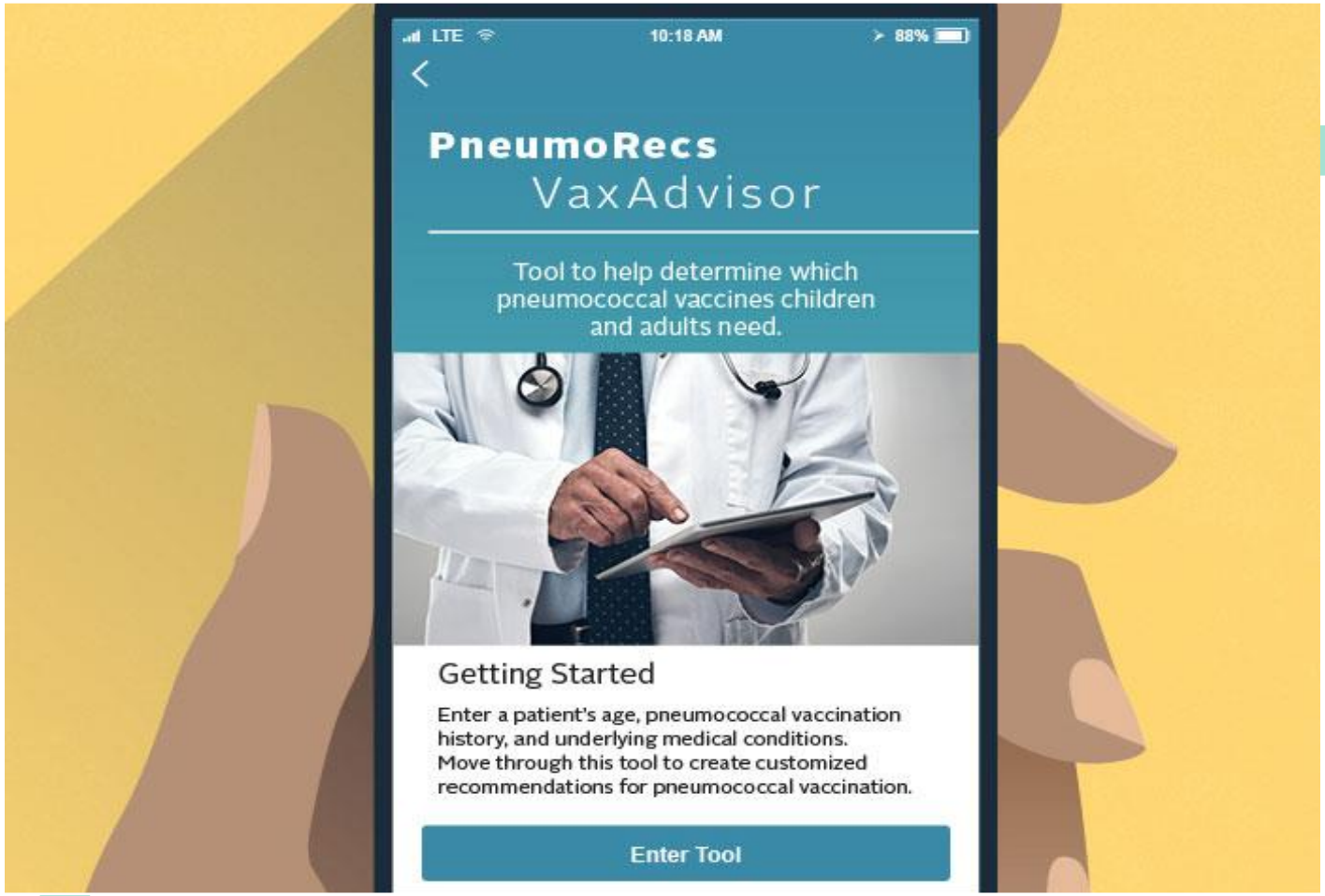
Impact on RIZE Measures

- **These measures are designed for benchmarking purposes and should not be used in place of clinical guidelines**
- **Changes effective July 1, 2022 (Q3 2022, report due on Oct. 14, 2022)**
  - Data for Q3 2019-Q2 2022 (submitted on Feb. 15, 2022, April 15, 2022, and July 15, 2022) are unaffected by these changes
  - These submissions will continue to follow the current Measurement Specifications and be reported using the current value set
- **We will provide updated Measurement Specifications and a value set prior to the change**

National Advisory Committee

- **Randy Bergen, M.D.**, Outpatient Pediatrics, Walnut Creek Medical Center, The Permanente Medical Group; Pediatric Infectious Disease Consultant; Clinical Lead, Kaiser Permanente, Northern California Flu Vaccine Program*
- **Frank Colangelo, M.D., FACP, M.S.-HQS**, Chief Quality Officer, Premier Medical Associates, P.C.
- **Heidi Rens, PharmD**, Director of Patient Safety and Clinical Programs, Integrated Quality Services, Sutter Health-Sutter Valley Medical Foundation
- **Leon Jerrels, RN, CPHQ**, Director Quality Improvement, Kelsey-Seybold Clinic
- **David Kim, M.D., M.A., CAPT**, U.S. Public Health Service, Director, Division of Vaccines, OIDP, OASH, U.S. Department of Health and Human Services
- **Stanley Martin, M.D.**, Director, Division of Infectious Diseases, Geisinger
- **Mitchel C. Rothholz, R.Ph., M.B.A.**, Chief Strategy Officer, American Pharmacists Association
- **Carrie Regnier, RN, M.P.H.**, Director, Quality and Clinical Effectiveness, Norton Medical Group
- **Vincenza Snow, M.D.**, Senior Medical Director of Vaccines, Pfizer Inc.
- **Elizabeth Sobczyk, M.S.W., M.P.H.**, Project Director, American Medical Directors Association – The Society for Post-Acute and Long-Term Care Medicine
- **Litjen (L.J.) Tan, M.S., Ph.D.**, Chief Strategy Officer, Immunization Action Coalition; Co-chair, National Adult Immunization Summit and National Influenza Vaccine Summit
- **Charles Van Duyne, M.D., M.S.**, Chief Medical Information/Innovation Officer, USMD Health System

**Emeritus*



RIZE Resource of the Month

PneumoRecs VaxAdvisor

App from the Centers for Disease Control and Prevention (CDC)

Upcoming Webinar

- Topic: Zoster 101
- Date/ Time: April 21, 2pm ET
- Presenter: Dr. Nimit Patel, Premier Medical Group

Questions?

Submit your questions using the **Q&A feature** at the bottom of the screen