

Proposed recommendation for use of PPSV23 among cigarette smokers

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Outline

- Summary of evidence documenting the association of cigarette smoking with invasive pneumococcal disease (IPD)
 - before and after routine childhood PCV7 use
- Prevalence of cigarette smoking, current PPSV indications and vaccine uptake among IPD cases and the U.S. population
- Workgroup's considerations of pros and cons regarding use of PPSV23 in smokers
- Proposed recommendation and vote

Background

- Current ACIP recommendations for use of PPSV23 in adults¹ do not address the association of cigarette smoking with invasive pneumococcal disease (IPD)
- In June 2008, the ACIP recommended that the WG evaluate whether a specific recommendation is needed for use of PPSV23 among cigarette smokers

Cigarette smoking and IPD before routine childhood PCV7 use

- Before routine use of childhood PCV7, population-base surveillance studies consistently reported that smokers accounted for ~half of otherwise healthy adults with IPD^{1,2}
- CDC ABCs population-based case-control study of cigarette smoking and IPD among immunocompetent adults aged 18-64 yrs

1. Plouffe JAMA 1996;275:194-8

2. Pastor CID 1998;26:590-5

Association of cigarette smoking and IPD

TABLE 4. INDEPENDENT RISK FACTORS FOR INVASIVE PNEUMOCOCCAL DISEASE AMONG IMMUNOCOMPETENT ADULTS 18 TO 64 YEARS OLD.

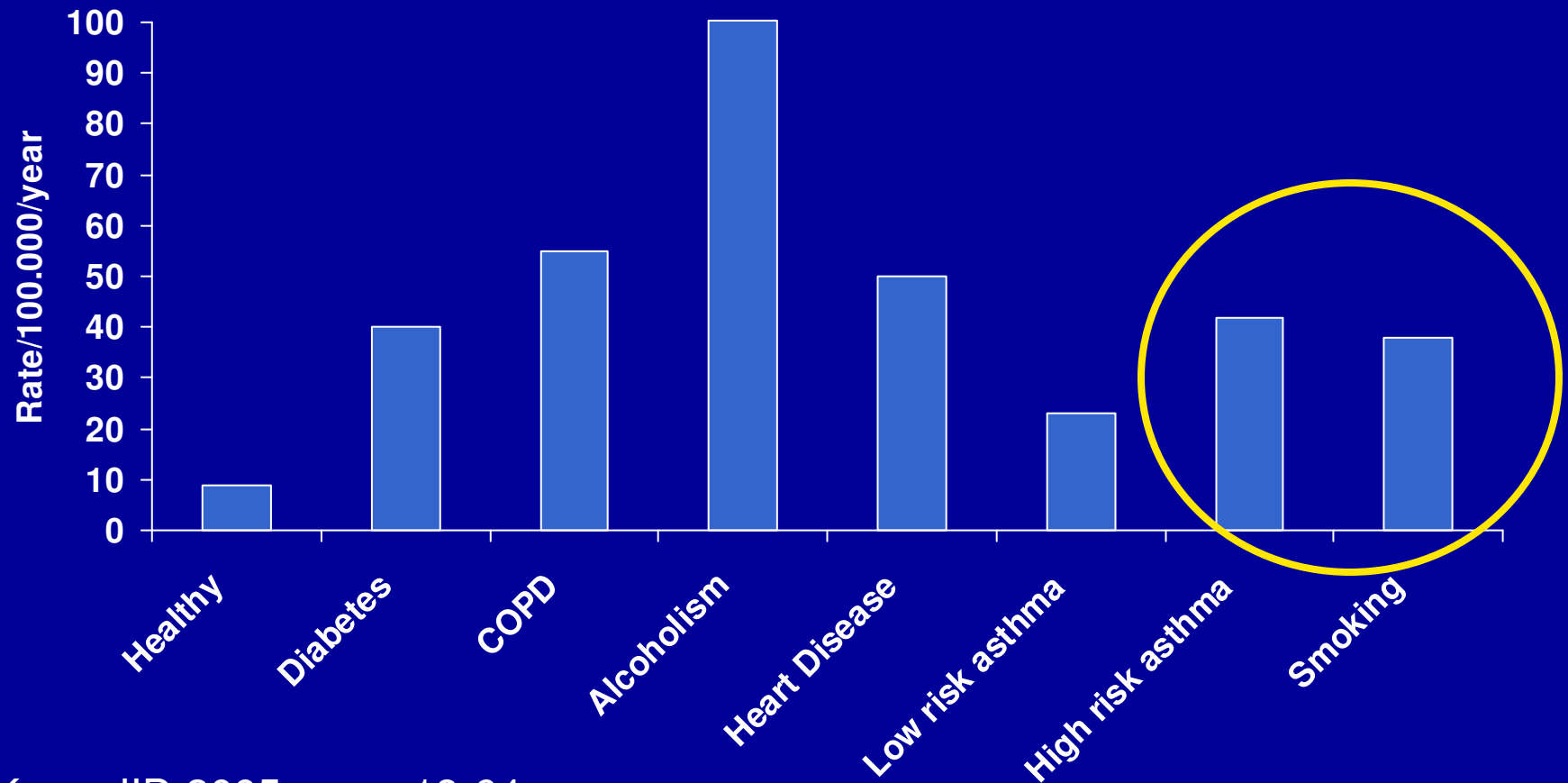
VARIABLE	ODDS RATIO (95% CI)*	P VALUE
Smoking status		
Current smoker	4.1 (2.4–7.3)	<0.001
Former smoker	1.1 (0.5–2.2)	0.91
Passive exposure to smoke	2.5 (1.2–5.1)	0.01
Never smoked and no passive exposure to smoke	1.0	

- Strongest independent risk-factor among immunocompetent, non-elderly adults¹
 - Adjusted population attributable risk: 51%
 - Dose response relations
- Association also confirmed among immunocompromised groups^{2,3}

1. Nuorti et al. N Engl J Med 2000;342:681-9

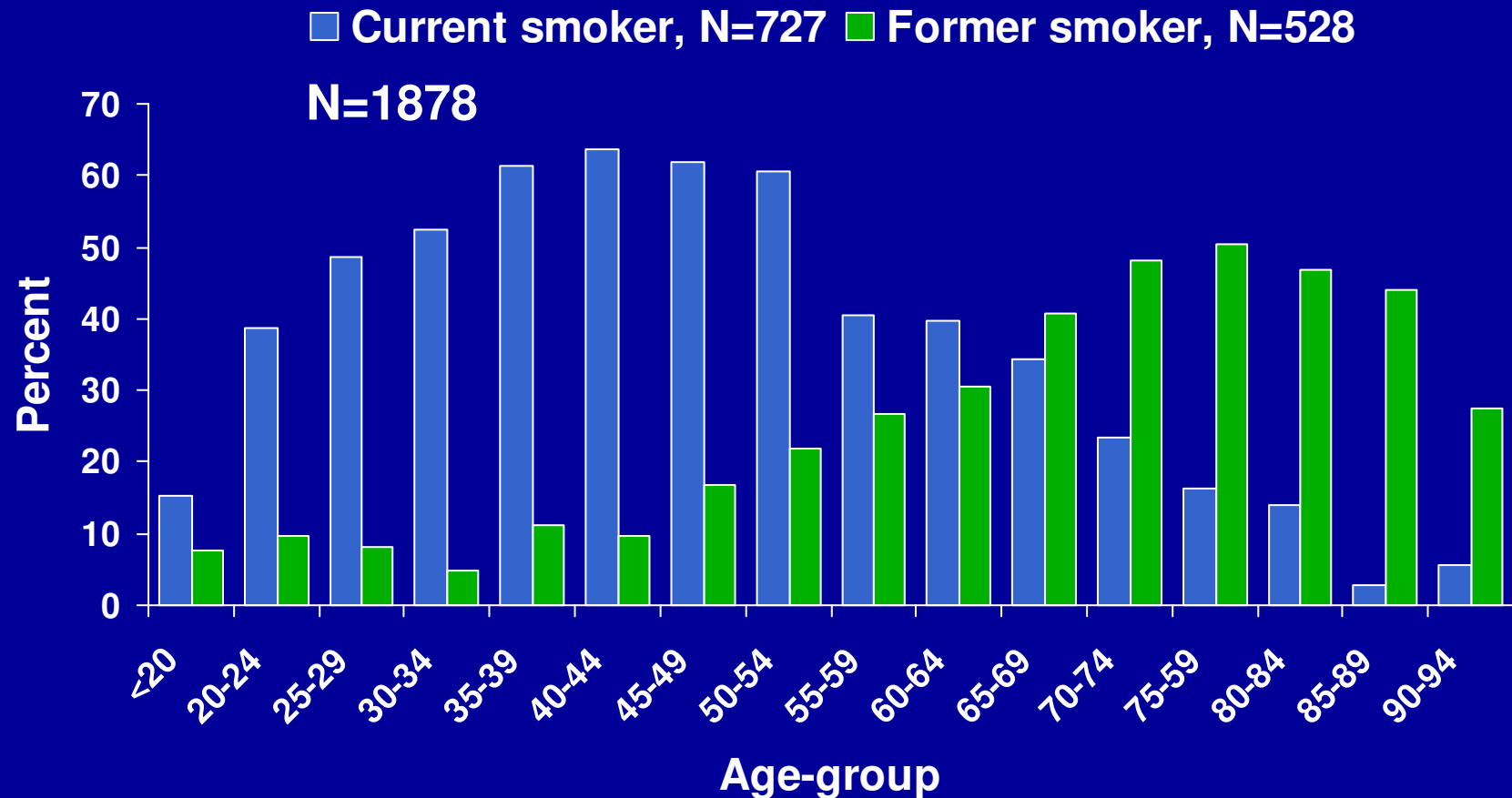
2,3. Breiman Arch Int Med 2000, Grau Arch Int Med 2005

Comparison of estimated IPD rates among asthmatics and smokers with rates among persons with current PPSV23 indications



Kyaw JID 2005, ages 18-64 years
Talbot NEJM 2005, ages 2-49 years
Nuorti NEJM 2000, ages 18-64 years

Prevalence of current and former smoking among IPD cases by age, CDC ABCs surveillance, 2001-2003



Proportion of IPD cases among smokers who had a current PPSV23 indication, CDC, ABCs 2001-2003

Age	Number IPD cases	Number (%) current smokers	Number (%) smokers with PPSV indication	% smokers with PPSV indication and vaccinated
18-34 y	163	75 (46)	39 (52)	28%
35-49 y	504	314 (62)	245 (78)	24%
50-64 y	457	211 (46)	164 (78)	29%
All	1124	600 (53)	448 (75)	27%

Prevalence of current and proposed PPSV23 indications in adults aged 19-64y, U.S. population, 2007

Age (yrs)	% with current PPSV indication (excluding asthma)	% with asthma only (no other indication)	% current smoker only (no other indication)	% with current PPSV indication, asthma or smoking
19-49 y	10.9	2.0	19.1	32.6
50-64 y	28.9	1.2	12.8	43.2
All	16.1	1.8	17.3	35.7

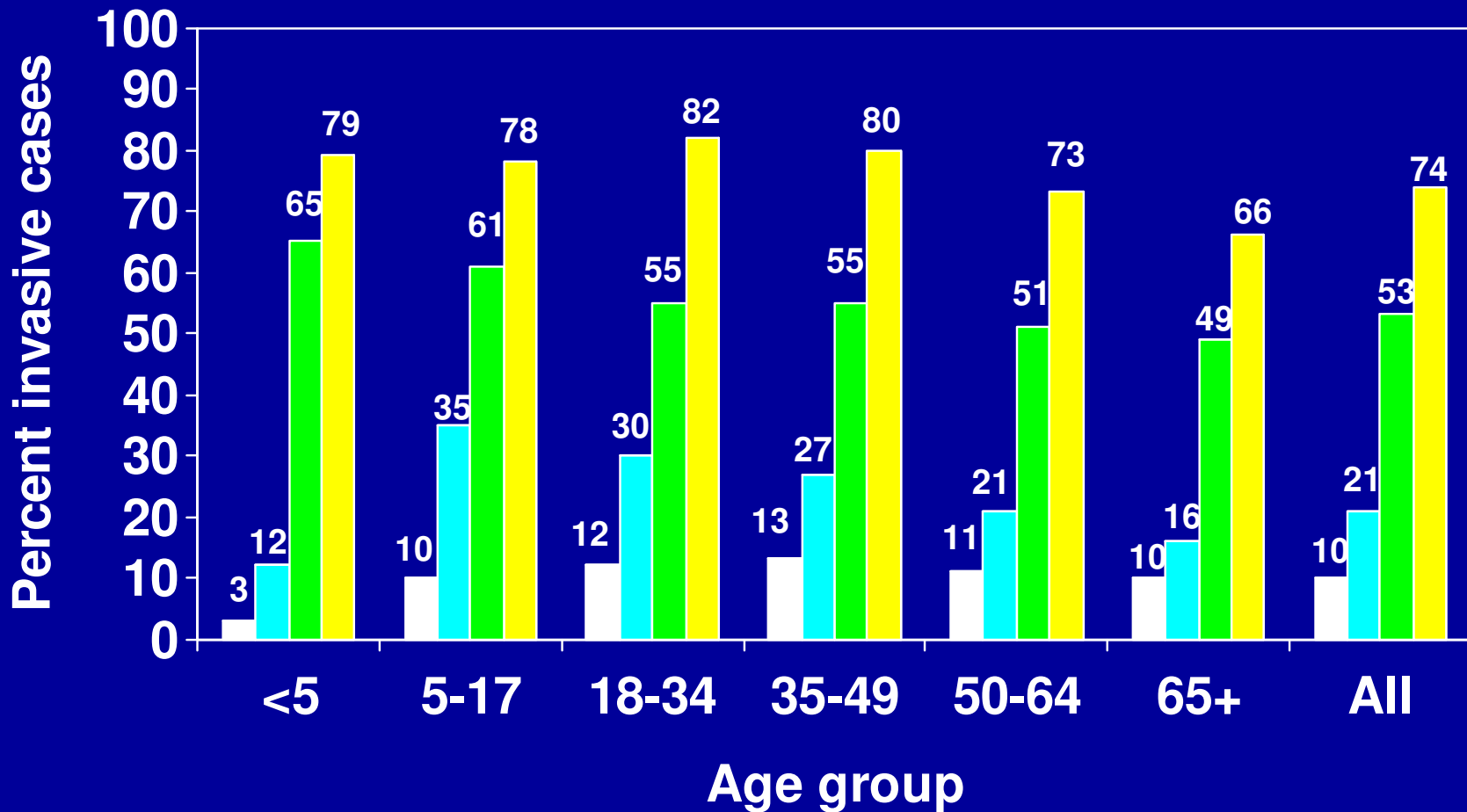
Size of current and proposed PPSV23 target groups and self-reported coverage, adults aged 19-64 years, U.S. 2007

Target group	U.S. population, (millions)	PPSV23 coverage (%)
Current PPSV indication*	32.3	24.5
Asthma only	3.9	13.6
Cigarette smoking only	31.6	6.0
Total	67.8	15.0

*Diabetes, heart diseases, bronchitis, emphysema, kidney disease, liver diseases and cancer National Health Interview Survey, 2007; U.S. Census Interim Population Projections, 2008

Percent of invasive pneumococcal cases caused by serotypes in different vaccine formulations, 2006

■ PCV7 ■ PCV10* ■ PCV13 ■ PPV23



Workgroup's considerations (1)

- Consistent data on increased risk of IPD among smokers
 - both immunocompetent and immunocompromised groups
- Increased risk and NNV among smokers similar to other high risk conditions (e.g., asthma)
- Many non-elderly adult IPD cases among cigarette smokers already have another condition for which PPSV23 is currently recommended
 - However, vaccine uptake is low
- Cigarette smoking is a risk behavior that is easy to identify in clinical practice
- Smoking cessation should be part of the therapeutic plan for persons hospitalized or treated for severe pneumococcal disease

IDSA / American Thoracic Society guidelines on the management of community-acquired pneumonia in adults

Smoking cessation should be a goal for persons hospitalized with CAP who smoke. (Moderate recommendation; level III evidence.)

Smokers who will not quit should also be vaccinated for both pneumococcus and influenza. (Weak recommendation; level III evidence.)

Workgroup's considerations (2)

- About one-fifth of U.S. adults smoke cigarettes
- Although many smokers have another PPSV23 indication, targeting this group may substantially increase the number of vaccines required
- As with other risk-based indications, determining optimal timing of vaccination with PPSV23 is challenging
 - Most smokers begin in adolescence or early adulthood but risk of IPD increases with increasing pack-years
 - Among IPD cases, smoking prevalence is high from early adulthood
 - Using indicators such as pack-years smoked may not be feasible in clinical practice
- Studies in older adults suggest that PPSV may result in lower antibody responses to subsequent PCV^{1,2}
 - Implications for potential future adult conjugate vaccine use unknown

Proposed recommendation for vote (1)

- “Persons at increased risk for invasive pneumococcal disease include those who smoke cigarettes.
- WG recommends adding cigarette smoking to the list of conditions that are indications for PPSV23 in adults aged 19 through 64 years
- Proposed wording: *“Persons aged 19 through 64 years who smoke cigarettes should receive PPSV23.”*

Proposed recommendation for vote (2)

- The workgroup also recommends revising the previously approved asthma recommendation to begin at age 19 years instead of age 18 years to avoid overlap with the adolescent schedule
- The recommendations for both asthma and smoking would then apply to people aged 19 through 64 years.
- Revised wording: “*Persons aged 19 through 64 years who have asthma should receive PPSV23.*”

Pneumococcal Vaccines

Workgroup Membership 2007-2008

- **ACIP members:**

- Michael Marcy (chair)
 - Dale Morse
 - Kathy Neuzil

- **Liaison representatives:**

- Nancy Bennett, NACCHO
 - Rick Zimmerman, Univ of Pittsburgh
 - Lorry Rubin, AAP/COID
 - William Schaffner, NFID

- **Ex Officio members:**

- Lucia Lee, FDA
 - Kristin Nichol, VA
 - Ray Strikas, NVPO

- **Consultants:**

- Jay Butler, Alaska DPH
 - Lisa Jackson, Group Health, WA
 - Julie Morita, Chicago Dept of PH
 - Farukh Khambaty, NIH/NIAID
 - Kate O'Brien, Johns Hopkins Univ

- **CDC**

- William Atkinson
 - Angela Calugar
 - Tom Hennessy
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 - Matt Moore
 - Gina Mootrey
 - Pekka Nuorti
 - Jennifer Rosen
 - Sandy Steiner
 - Cynthia Whitney