

Safety, Tolerability, and Immunogenicity of Pneumococcal Vaccine V116 in Adults: A Systematic Review and Network Meta-Analysis

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WHAT THIS STUDY ADDS First network meta-analysis pooling head-to-head RCTs of V116 against licensed adult vaccines PPSV23, PCV15 and PCV20

7 RCTs

8,025 adults: 4,703 V116 vs 3,322 on comparators

RR 2.06

≥4-fold OPA rise vs PPSV23
95% CI 1.77–2.40 · p<0.001

RR 6.37

Largest gain: 35B
95% CI 1.52–26.73

#1 rank

Best-ranked vaccine
in all 6 ranked endpoints

RR 1.22

Headache (1.07–1.40): the
only significant AE signal

BACKGROUND

- S. pneumoniae*: a major cause of hospitalisation and death in older adults.
- V116 serotypes caused >85% of IPD in US adults ≥65 y before COVID-19; ~30% from 8 serotypes in no approved vaccine.¹
- Gap: V116 trial data scattered; no pooled comparison.

OBJECTIVE & PICOS

OBJECTIVE

Compare the immunogenicity and reactogenicity of V116 with licensed vaccines in adults.

P

Adults ≥18 y, healthy or with comorbidities; naïve or vaccine-experienced

I

V116 (Capvaxive™) 21-valent PCV, primary/booster

C

PPSV23 · PCV15 · PCV20

O

Immunogenicity: ≥4-fold OPA rise, OPA GMT/GMFR, IgG GMC. Reactogenicity: local & systemic AEs, SAEs

S

Peer-reviewed RCTs only (adult populations)

METHODS

Design:

PRISMA-NMA⁴ · PROSPERO CRD420251055417

Search:

PubMed, Embase, Scopus, Google Scholar (to Dec 2025)

Model:

random-effects frequentist NMA

Ranking:

SUCRA / P-scores

Robustness:

leave-one-out, funnel plots

RoB 2:

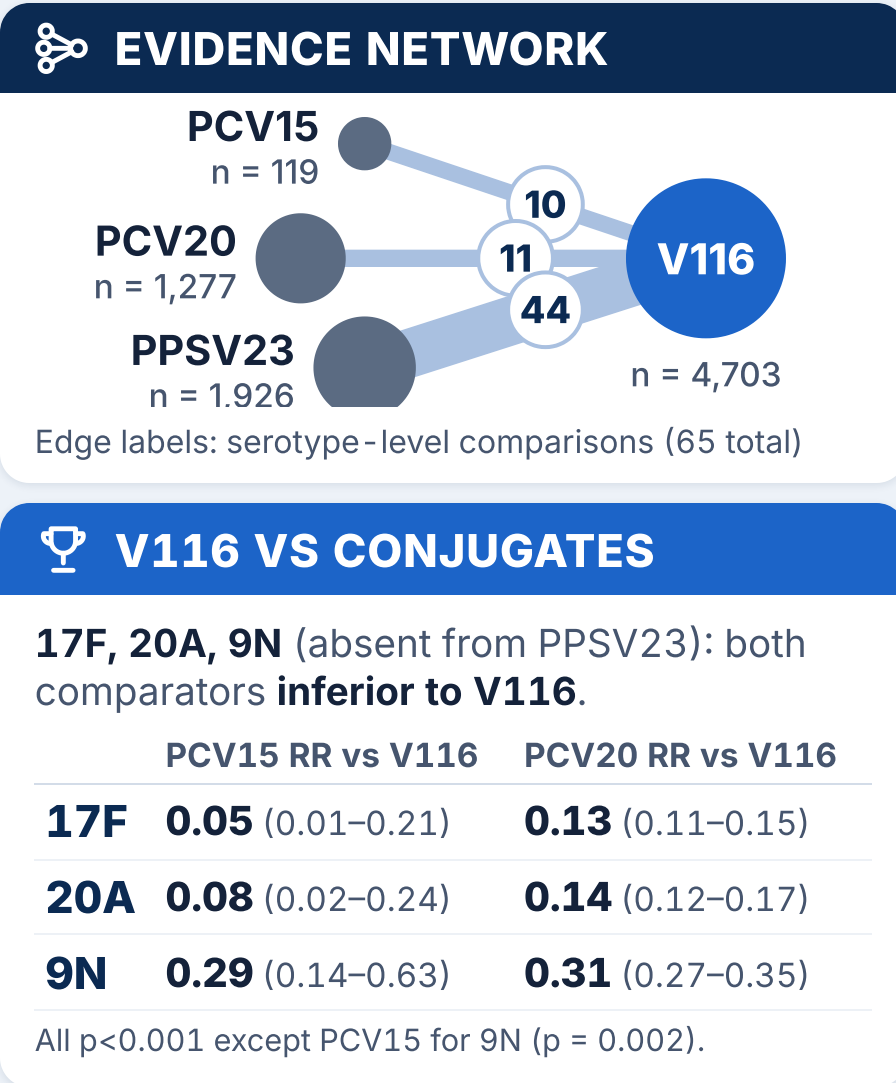
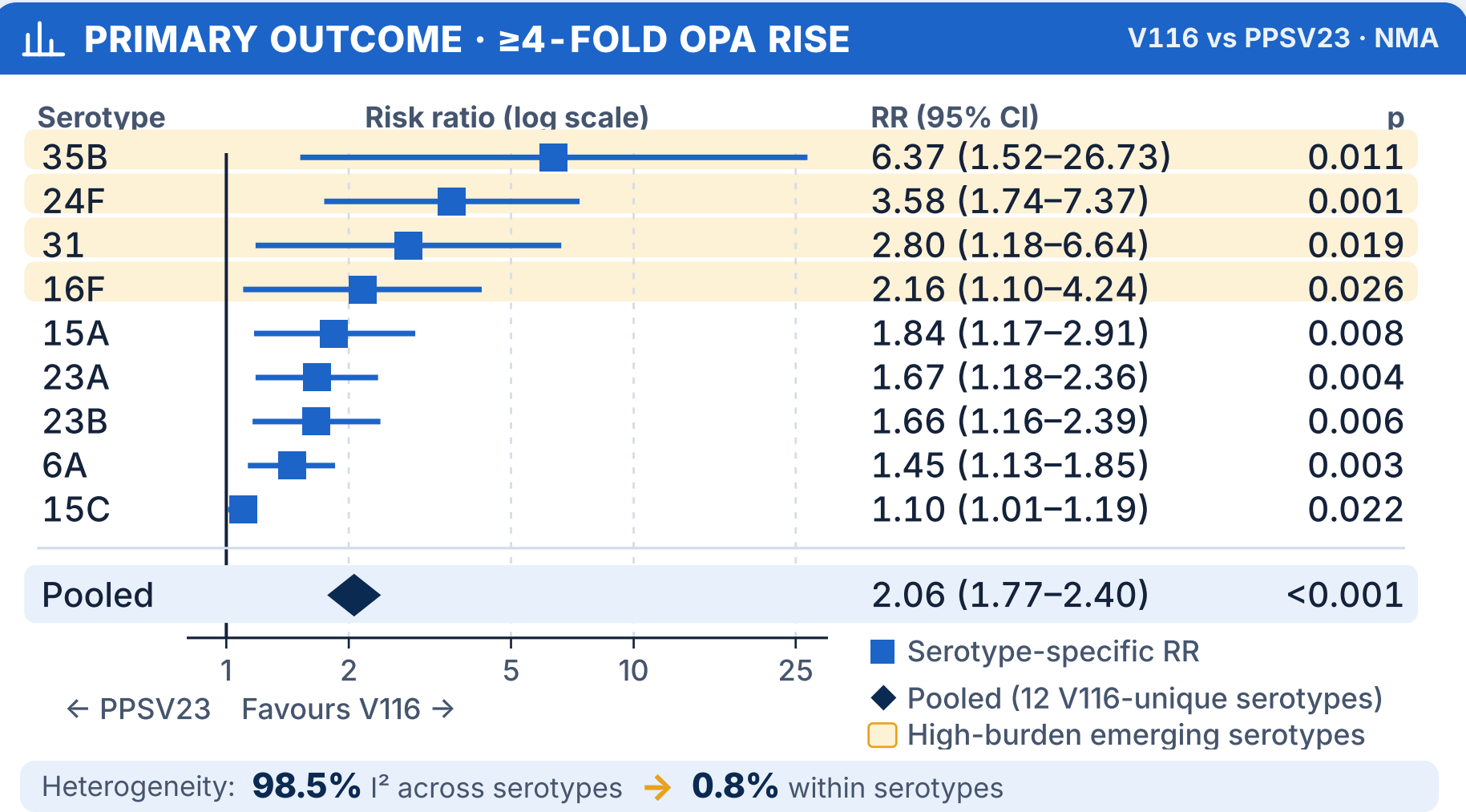
4 low, 3 some concerns, 0 high

1,293 records

1,113 screened

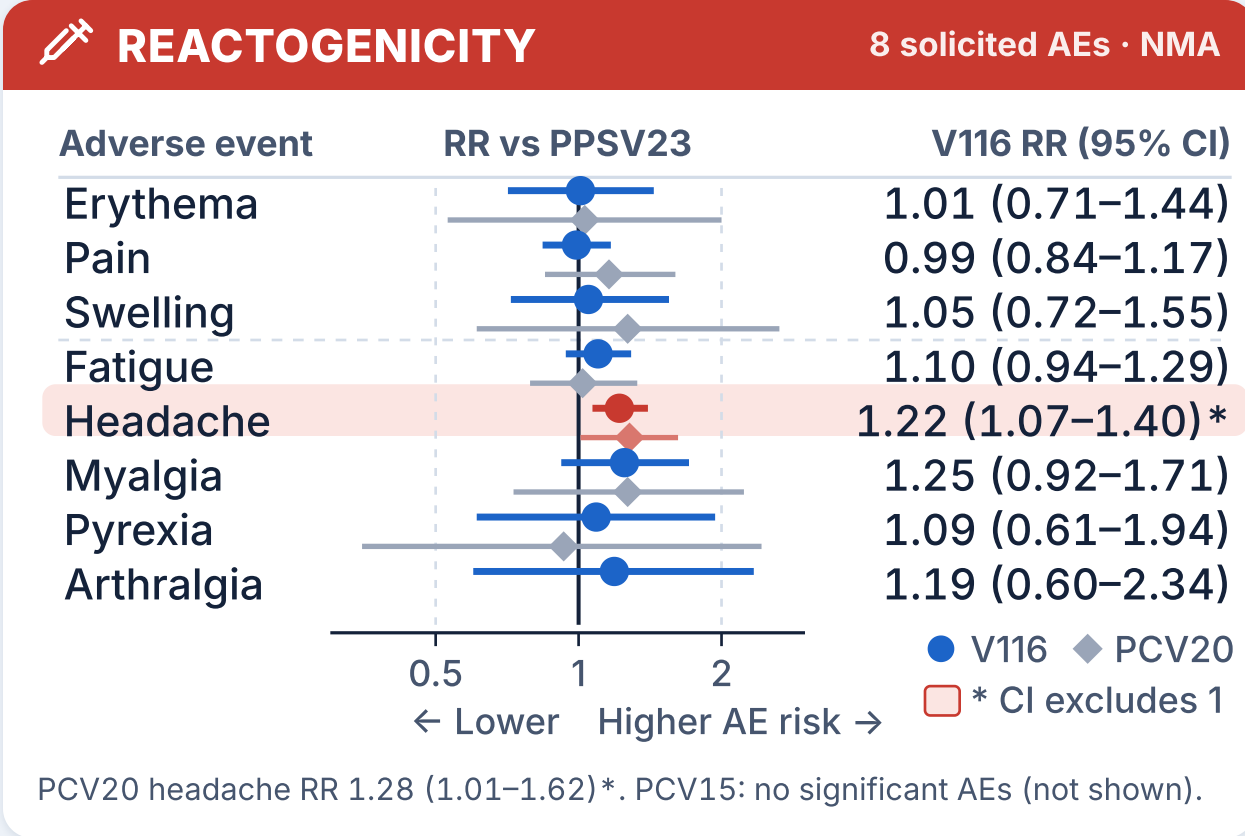
45 full text

7 RCTs
10 cohorts^{2,3}



ALL IMMUNOGENICITY ENDPOINTS						V116 vs PPSV23	
Endpoint	Sero-types	Stud-ies	V116 vs PPSV23 (95% CI)	p	Rank		
V116-UNIQUE SEROTYPES · LARGE GAINS							
≥4-fold OPA rise	12	7	RR 2.06 (1.77–2.40)	<0.001	1st		
OPA GMFR	9	3	+1.515 (1.257–1.773)	<0.001	1st		
IgG	9	8	+1.969 (1.819–2.118)	<0.001	1st		
COMMON SEROTYPES · MODEST GAINS							
≥4-fold OPA rise	13	6	RR 1.04 (1.02–1.05)	<0.001	1st		
OPA GMFR	12	3	+0.200 (0.082–0.318)	<0.001	1st		
IgG GMC	13	8	+0.344 (0.274–0.413)	<0.001	1st		
IgG GMFR*	13	2	+0.214 (–0.057–0.485)	0.122	n/a		

Continuous outcomes: log-scale effects (>0 favours V116). *2 studies, not ranked.



CONCLUSION

V116 is the strongest adult pneumococcal immunogen: ~2× PPSV23's response (RR 2.06), acceptable safety.

CLINICAL IMPLICATIONS FOR PRACTICE

CHOOSING A VACCINE

Targets serotypes behind most adult IPD; strongest response supports wider adult use.

EMERGING SEROTYPES

Largest gains for 35B, 24F, 31, 16F: rising adult IPD serotypes absent from licensed conjugates.

WHO BENEFITS

Consistent in vaccine-naïve and previously vaccinated adults, across ages and regions.

COUNSELLING PATIENTS

Local reactions as with other vaccines; advise of possible mild headache.

Caveat:

evidence rests on immunogenicity surrogates from 7 RCTs; effectiveness, durability and high-risk-group data are still needed before schedule changes.