Epidemiology of pneumococcal disease post 13vPCV

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Never Stand Still | Faculty of Medicine | School of Public Health and Community Medicine

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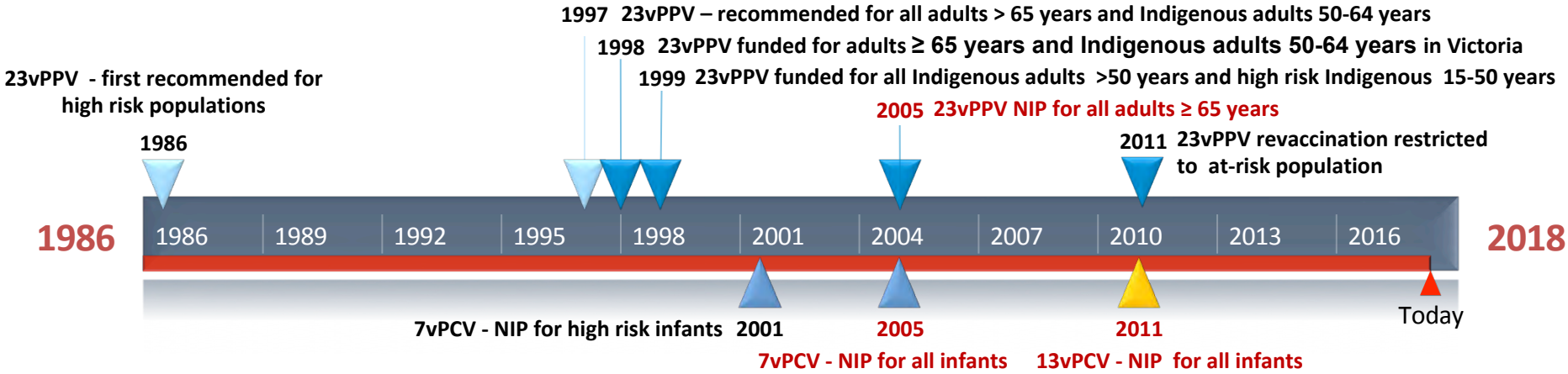
Acknowledgement

I would like to acknowledge that the land we meet on today is the traditional lands for the **Kaurna** people and that I respect their spiritual relationship with their Country. I also acknowledge the Kaurna people as the traditional custodians of the Adelaide region and that their cultural and heritage beliefs are still as important to the living Kaurna people today.

Background

Australia has had universal pneumococcal immunisation programs since 2005, expanded from earlier programs

- 23vPPV for all adults ≥ 65 years, Indigenous adults 50-64 years
- 7vPCV for all infants, replaced by 13vPCV in July 2011



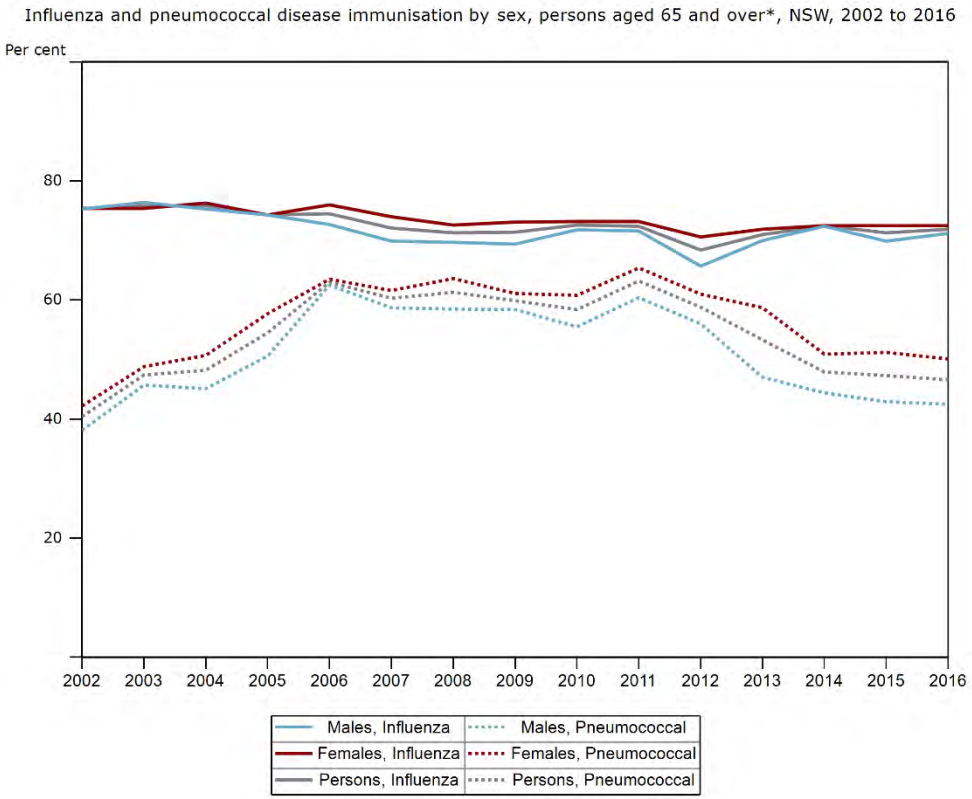
Adapted from NCIRS publication "Significant events in pneumococcal vaccination practice in Australia" available at http://www.ncirs.edu.au/assets/provider_resources/history/Pneumococcal-history-November-2015.pdf, accessed 8 May 2018

- Serotype-specific epidemiology of pneumococcal disease is influenced by direct and indirect impact of pneumococcal vaccination programs
- We examine the serotype specific epidemiology of invasive pneumococcal disease (IPD) in non-Indigenous adults aged ≥ 65 years.

Coverage in adults: dropping in recent years?

NSW Population Health Survey - longitudinal pneumococcal disease immunisation data

- Collected through Computer Assisted Telephone Interviewing



- Clear gap in pneumococcal compared to influenza vaccination coverage
- Significant coverage in non-Indigenous population pre-2005 NIP Reduced coverage following change to revaccination recommendation in 2011
- Coverage:
  - 49% in 2016 vs 65% in 2011
- Results consistent with AIHW Adult Vaccination Surveys

Source: Centre for Epidemiology and Evidence. HealthStats NSW. Sydney: NSW Ministry of Health. Available at: www.healthstats.nsw.gov.au. Accessed 10/5/18

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Methods

1. TRENDS IN SEROTYPE DISTRIBUTION OF INVASIVE PNEUMOCOCCAL DISEASE IN NON-INDIGENOUS OLDER AUSTRALIAN

A. Stein[1], A. Cripps[2], J. Litt[3], R. Booy[4], R. Menzies[5]

    1. Analyses were performed on IPD notification data in adults ≥ 65 years classified as non-indigenous or with unknown indigenous status collected through National Notifiable Diseases Surveillance System from 2002 to 2016
    2. Provided by the Office of Health Protection, Department of Health, on behalf of the Communicable Diseases Network Australia.
    3. Current as at 30 August 2017

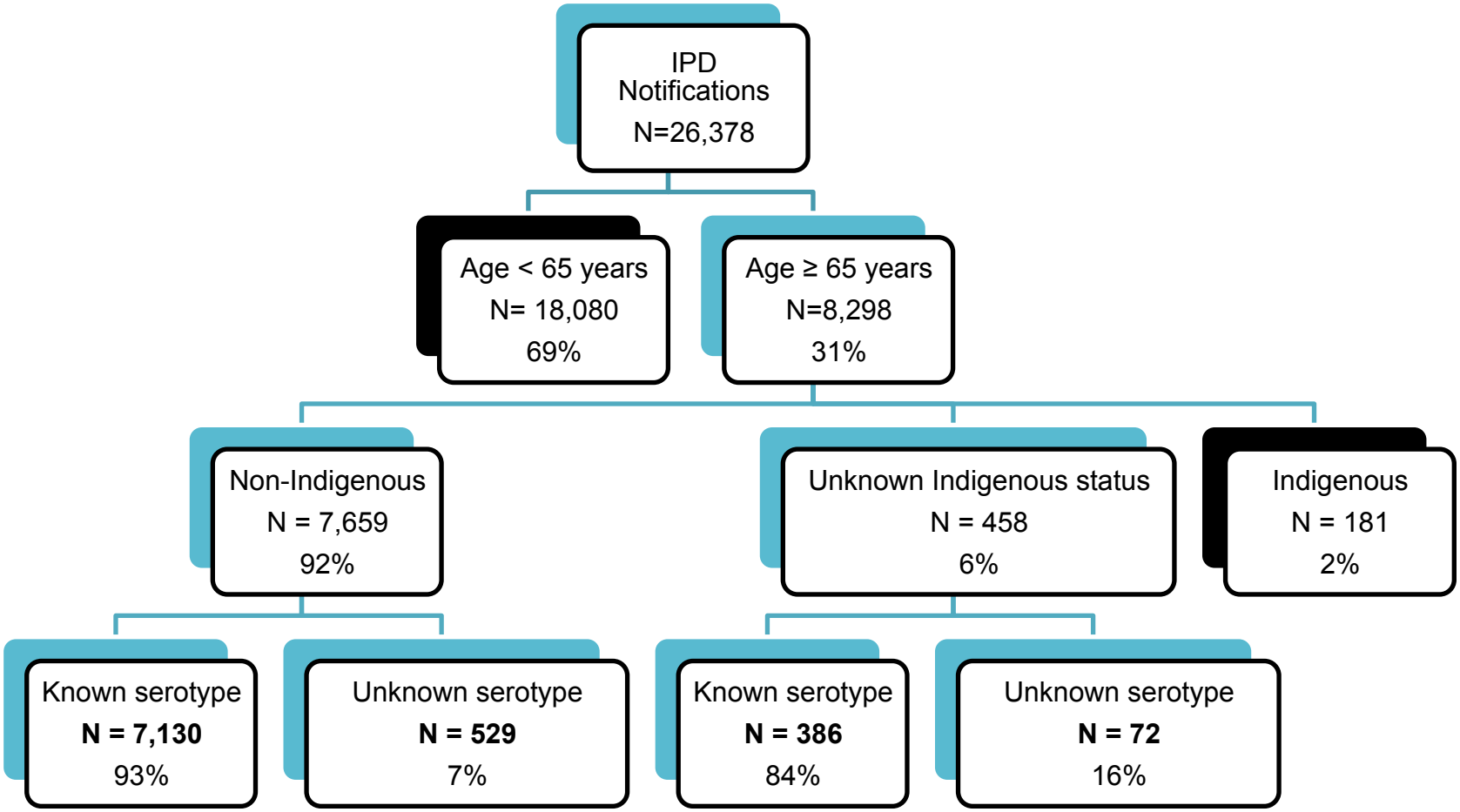
2. CDNA IPD quarterly report April-June 2017

3. PNEUMOCOCCAL DISEASE TRENDS IN AUSTRALIA 2002-2016

K Meder, S Jayasinghe, F Beard et el.

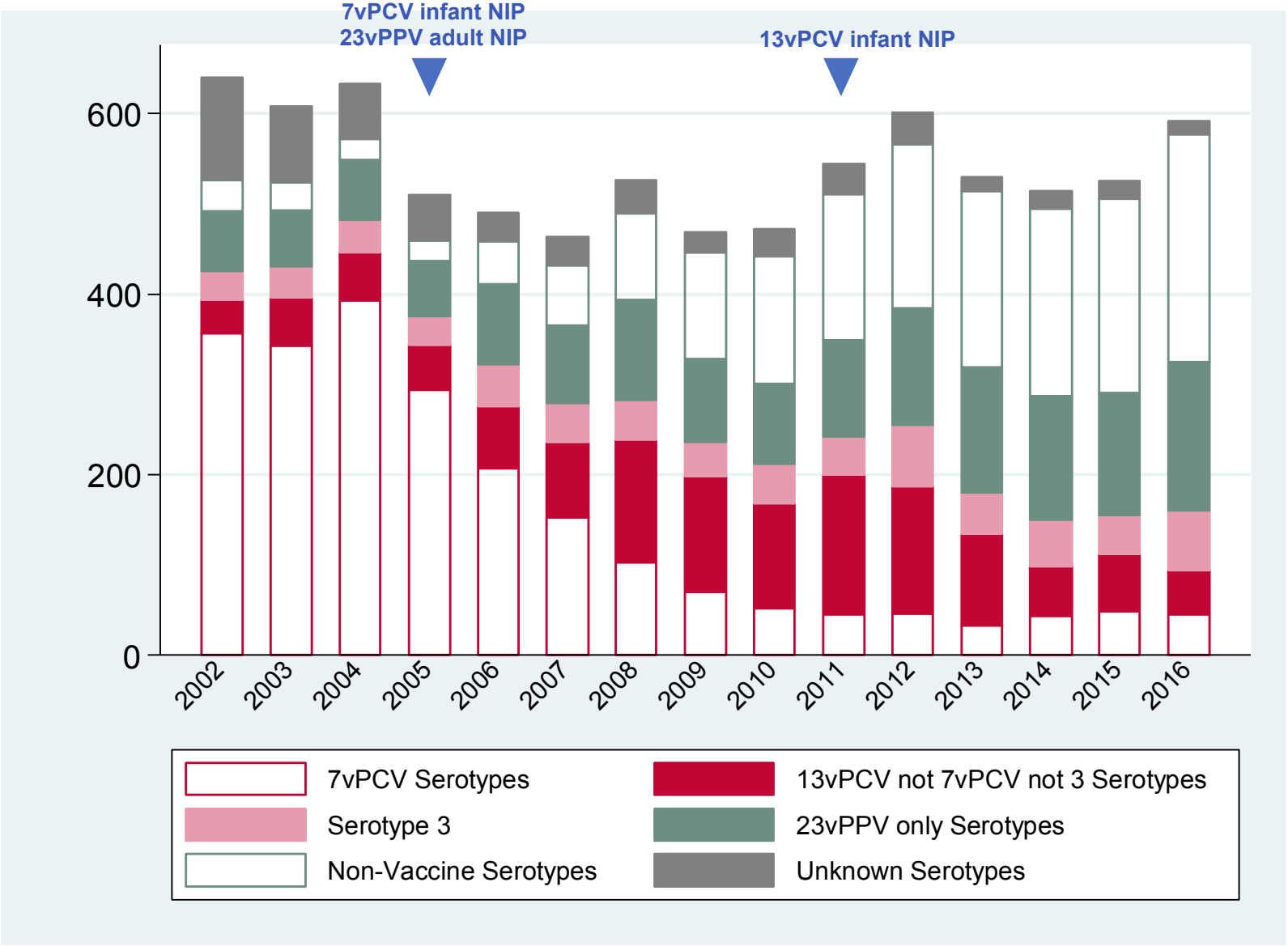
    1. National Hospital Morbidity Database
        1. Hospital separations for pneumococcal and lobar pneumonia

IPD Notifications in Australia 2002 to 2016

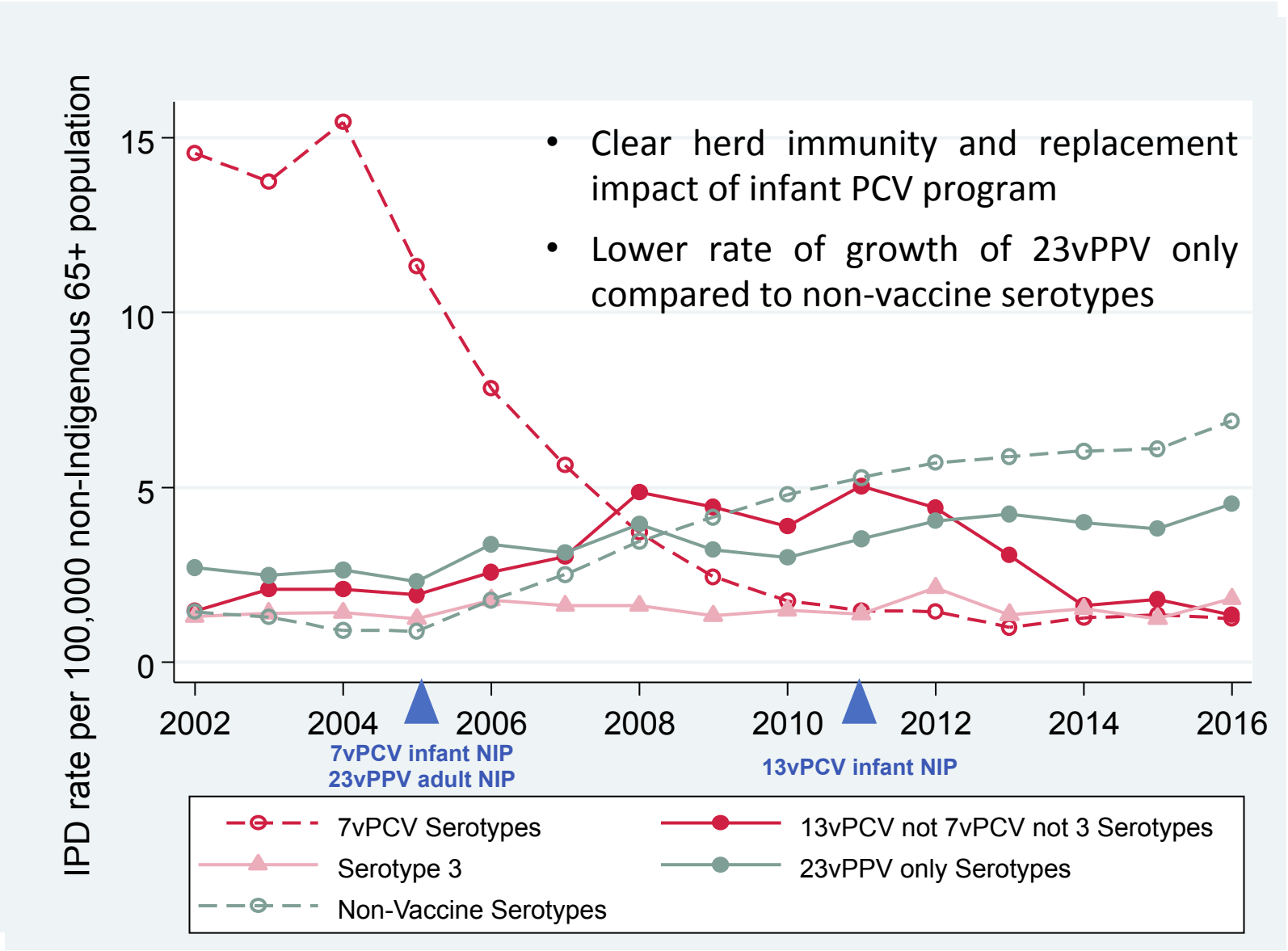


For subsequent analyses, IPD cases with unknown Indigenous status are assumed to be non-Indigenous

IPD notifications show changes in serotype distribution over time



Trends in serotype-specific IPD incidence reflect impact of infant and adult vaccination program



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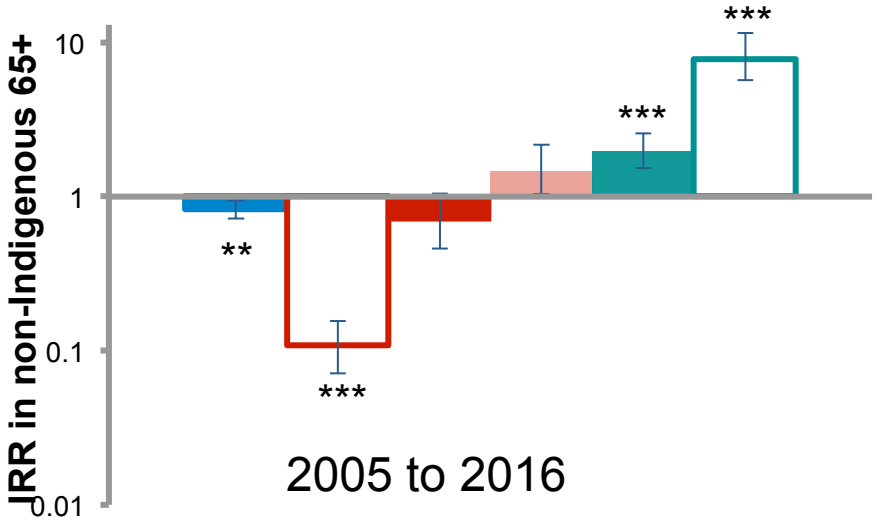
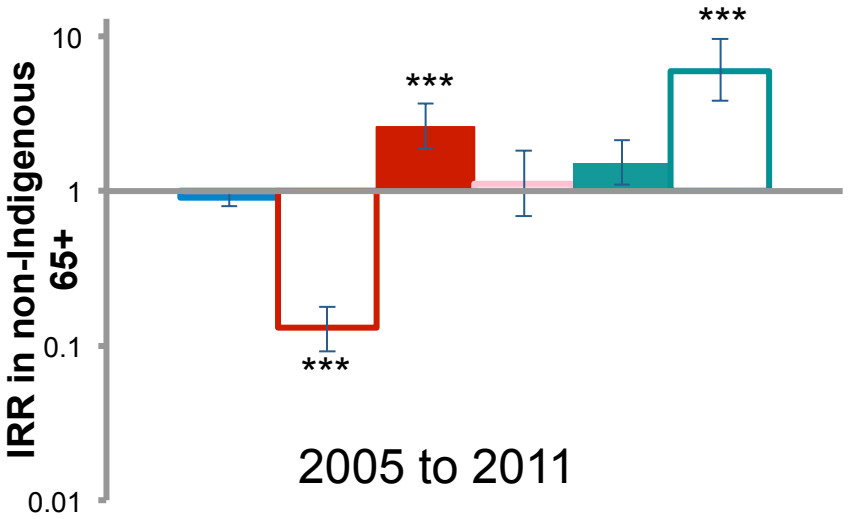
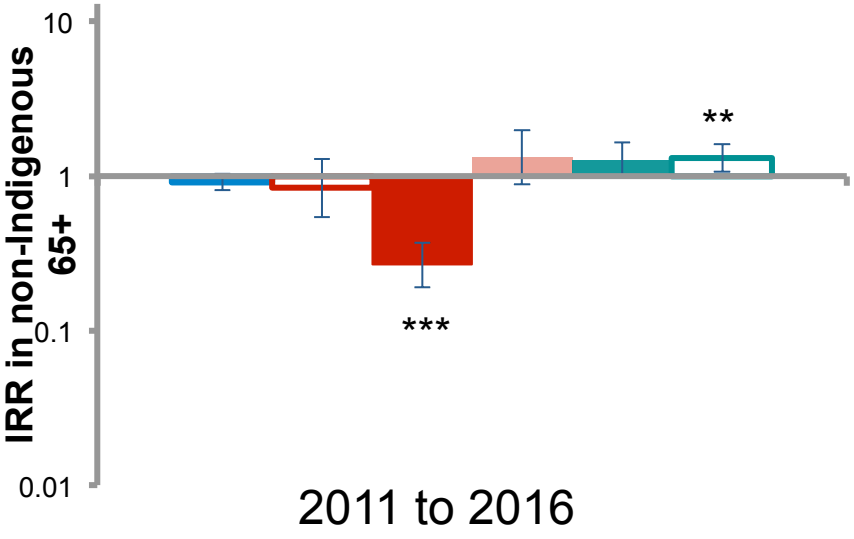
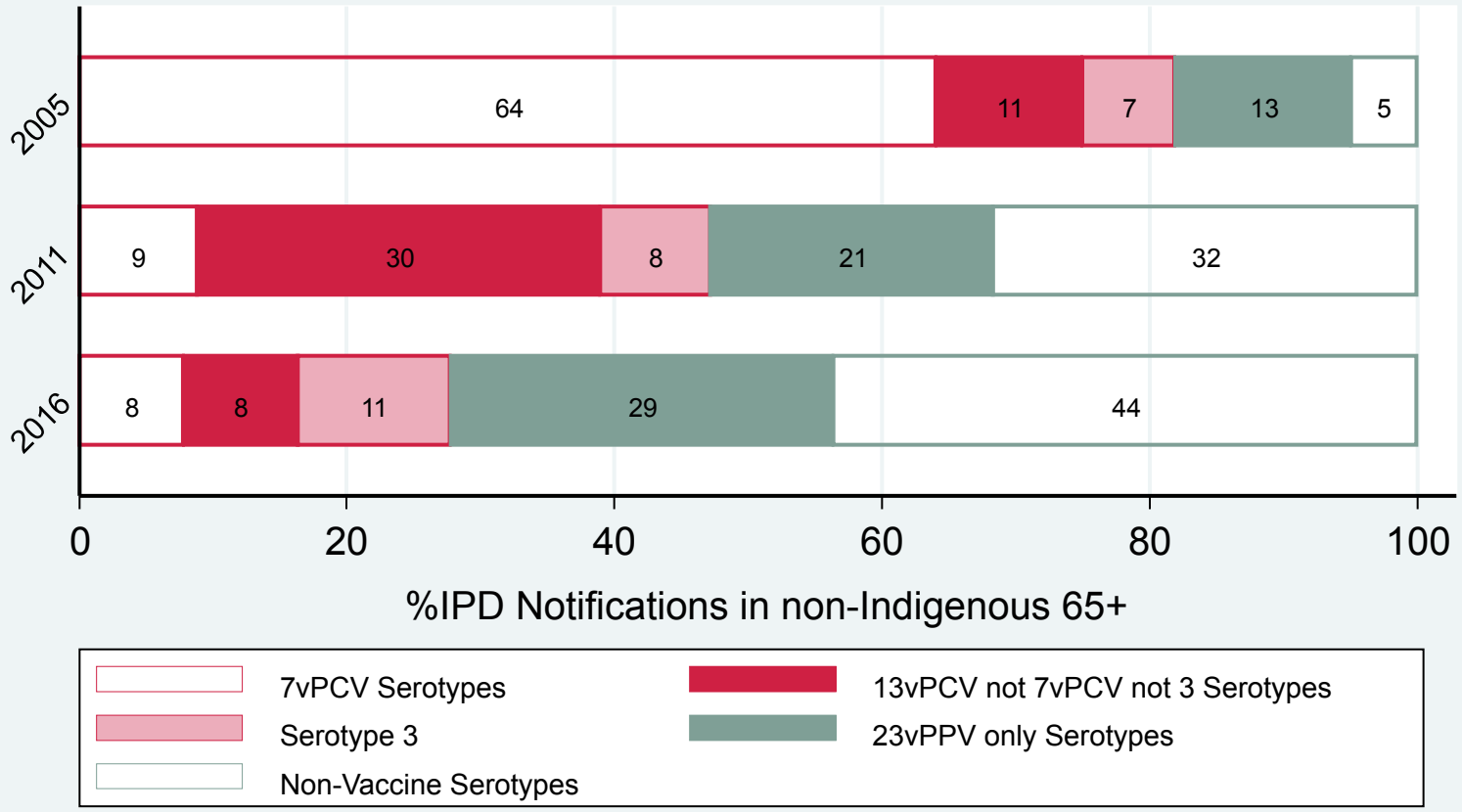






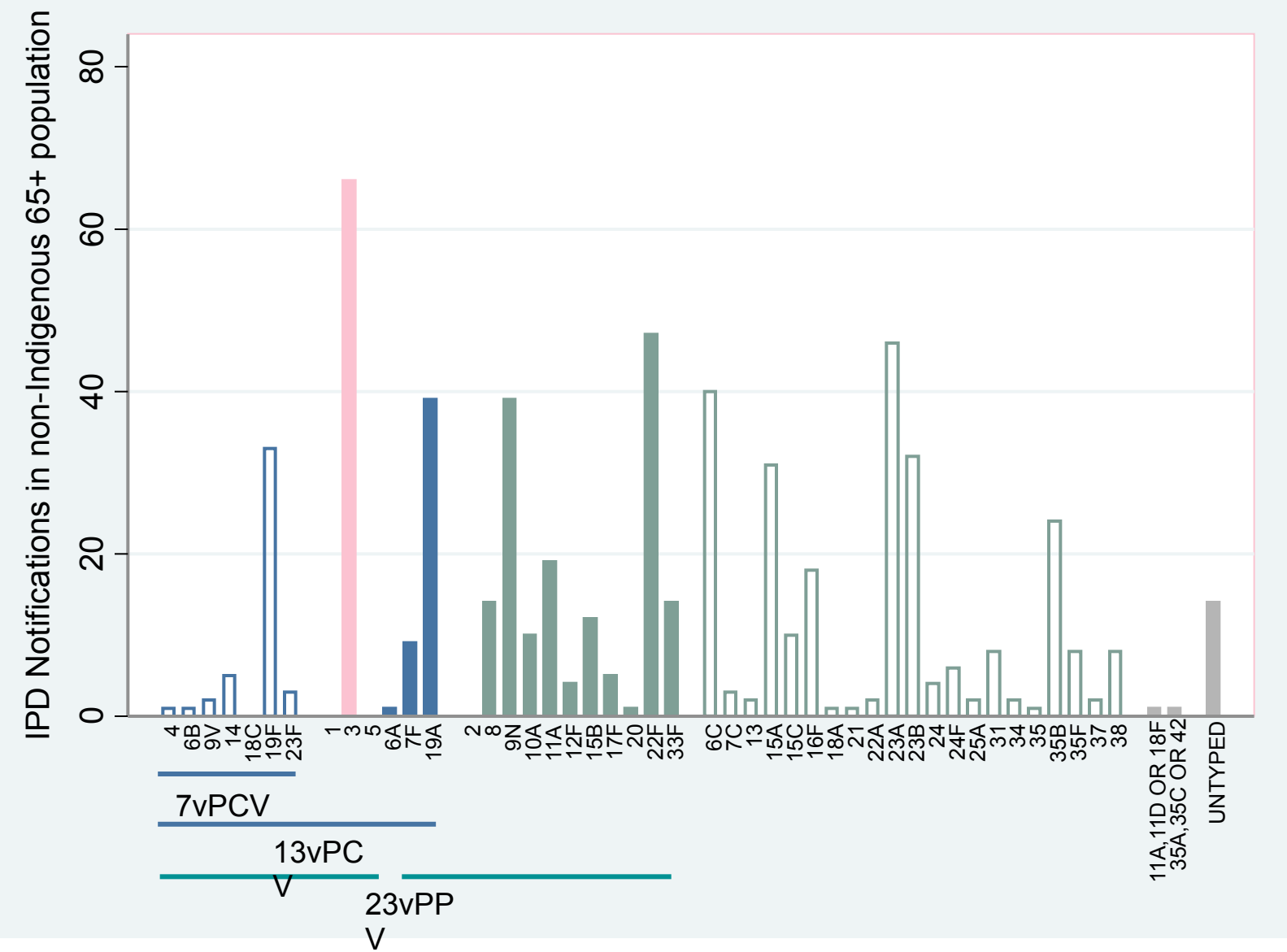
Group	2016:2005	p value
All IPD	0.83 (0.73 - 0.93)	0.0015
7vPCV Serotypes	0.11 (0.08 - 0.15)	< 0.0001
13vPCV not 7vPCV not 3 Serotypes	0.70 (0.46 - 1.05)	0.0731
Serotype 3	1.47 (0.95 - 2.31)	0.0732
23vPPV only Serotypes	1.95 (1.45 - 2.67)	< 0.0001
Non-Vaccine Serotypes	7.78 (5.07 - 12.51)	< 0.0001

Proportion of vaccine-preventable IPD is decreasing

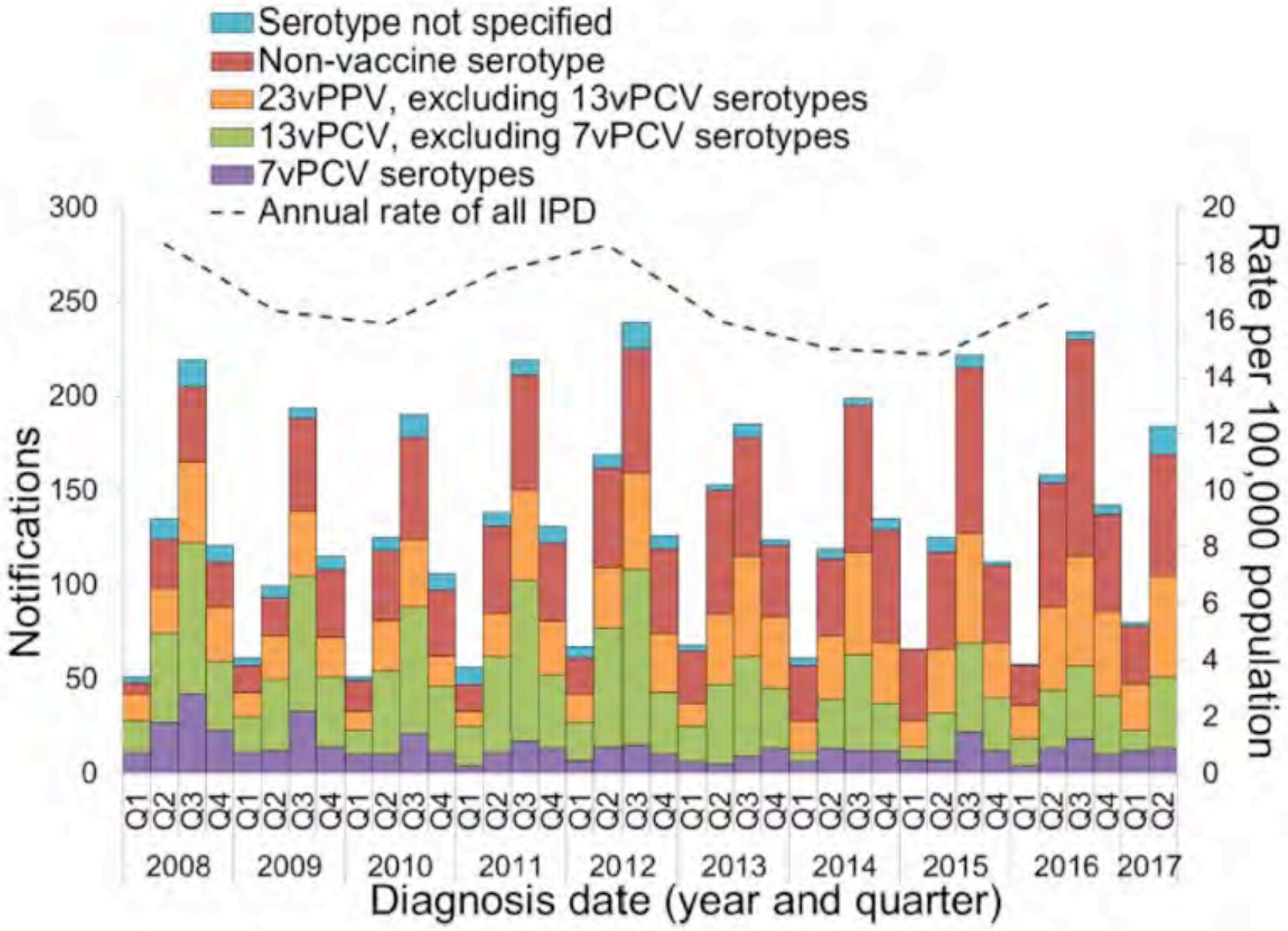


	7vPCV	13vPCV	23vPPV (+6A)
2005	64%	82%	95%
2011	9%	47%	68%
2016	8%	27%	56%

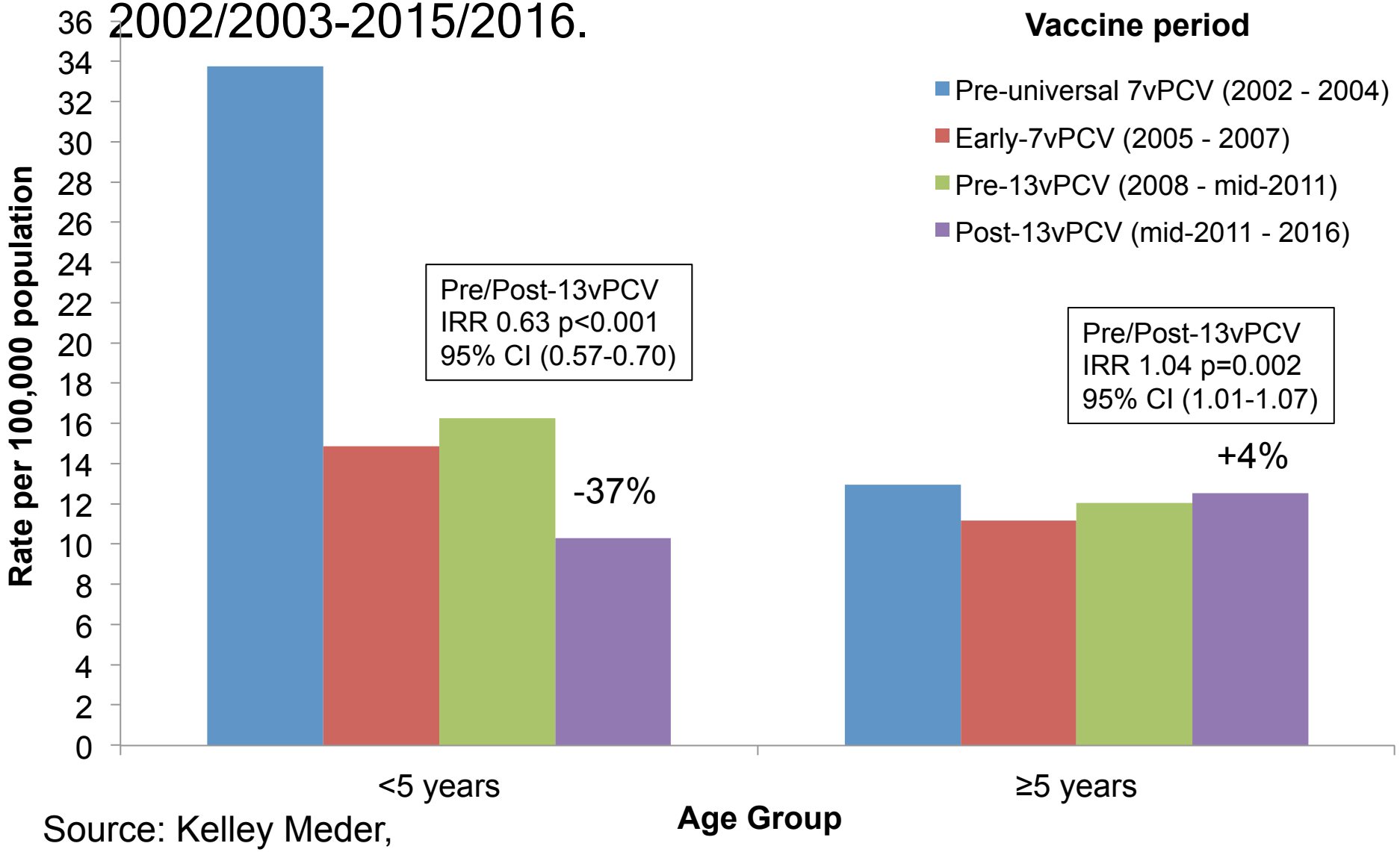
Serotype 3 was the most common in 2016



IPD in non-Indigenous Australians aged ≥65

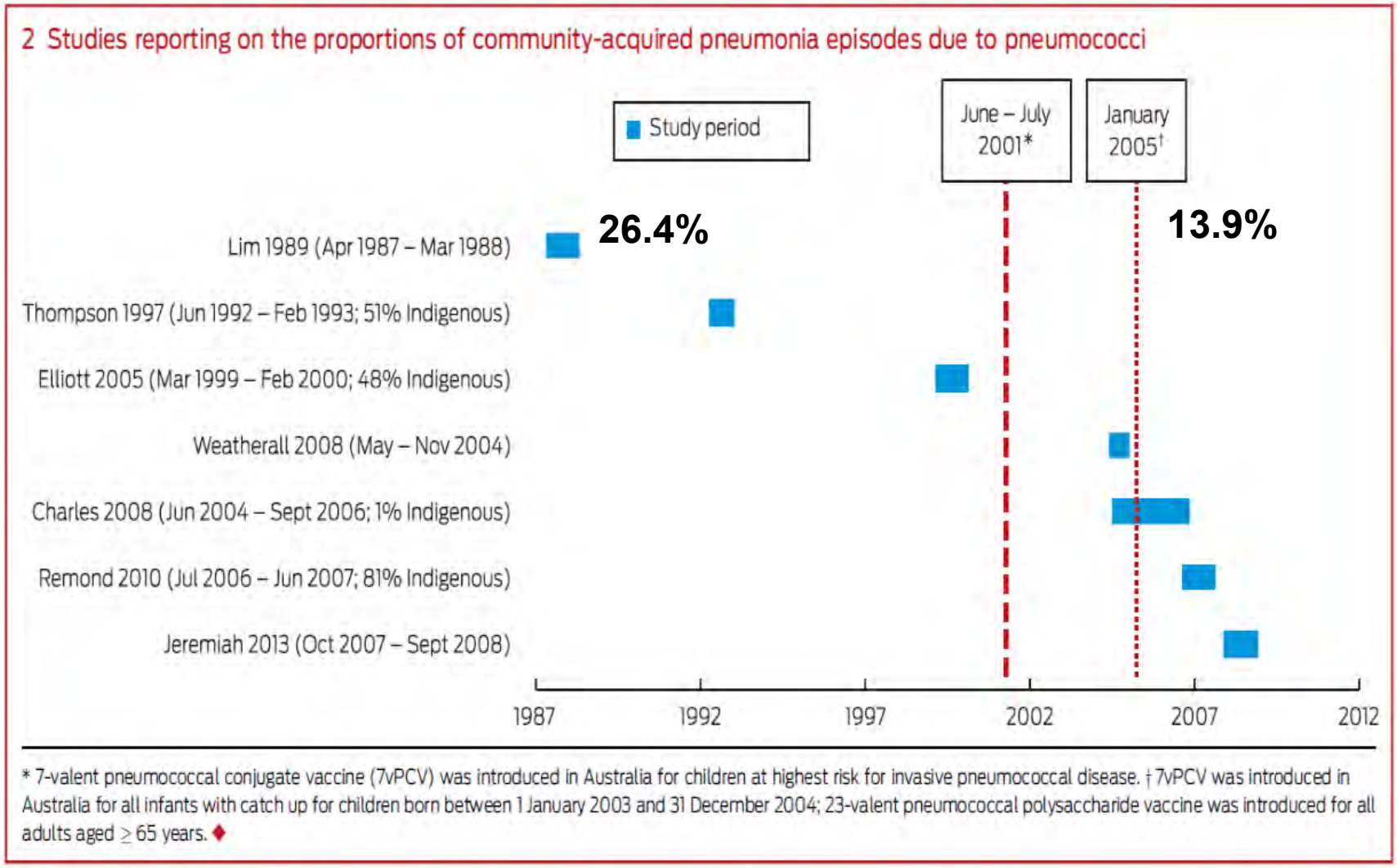


Trends of presumptive PnCAP hospitalisations by age group and 13vPCV period in Australia, 2002/2003-2015/2016.



Source: Kelley Meder, NCIRS

Percentage of pneumonia caused by Strep pneumoniae



Source: Determining the contribution of Streptococcus pneumoniae to community-acquired pneumonia in Australia. MJA 2017.

Conclusions

- Infant and adult pneumococcal vaccination programs have shaped the epidemiology of IPD in the non-Indigenous 65+ population.
  - Clear herd immunity impact for PCV serotypes excluding serotype 3.
  - Clear evidence of serotype replacement with non-PCV vaccine serotypes
  - Lower rate of growth of 23vPPV only compared to non-vaccine serotypes
- Serotype 3 accounts for the majority of remaining IPD due to 13vPCV serotypes
- There is a substantial remaining burden of IPD due to 23vPPV serotypes, supporting the potential benefit of increasing adult 23vPPV coverage.
- An increasing proportion of IPD is due to non-vaccine serotypes.
- Proportion of pneumonia caused by Strep pneumoniae has decreased since the introduction of conjugate vaccines for infants.
- Hospitalisations for pneumococcal and lobar pneumonia decreased after 7vPCV but have not decreased post-13vPCV

ACKNOWLEDGEMENTS

Office of Health Protection, Department of Health, who provided NNDSS IPD data on behalf of the Communicable Diseases Network Australia

Enhanced Invasive Pneumococcal Disease Surveillance Working Group (EIPDSWG), who oversee surveillance of IPD in Australia.

Public health units and reference laboratories who collect national IPD surveillance data

Australian Institute of Health and welfare