

Pneumococcal disease epidemiology in Indigenous population

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Immunisation Coalition - Adult Immunisation Forum
8 June 2018
Adelaide

Acknowledgement of Country

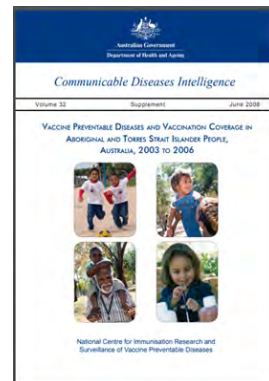


I would like to acknowledge that the land we meet on today is the traditional lands for the **Kurna** people and that I respect their spiritual relationship with their Country. I also acknowledge the Kurna people as the traditional custodians of the Adelaide region and that their cultural and heritage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

This artwork was painted by Mr Maurice Shipp, a Wiradjuri man from Dubbo who grew up between Canberra and Sydney. Maurice has worked in both the government and community controlled sectors of Aboriginal health for over 20 years. The background is representative of the land (ochre), which symbolises connectedness for Aboriginal people. The black lines represent the people. The white circles represent healthy cells. The coloured dots represent the vaccines that work towards protecting cells from diseases and illness.

Context

- Indigenous children and adults at increased risk of Invasive and non-invasive Pneumococcal Disease
- As such, funded pneumococcal vaccination programs fast-tracked for Indigenous populations
 - Available regionally since 1994
 - nationally since 1999
- Numerous modifications to Indigenous pneumococcal vaccination programs occurred since their introduction
- Changing landscape of PD epi in Indigenous population, post PCV, means a re-examination of current vaccination strategy may be required



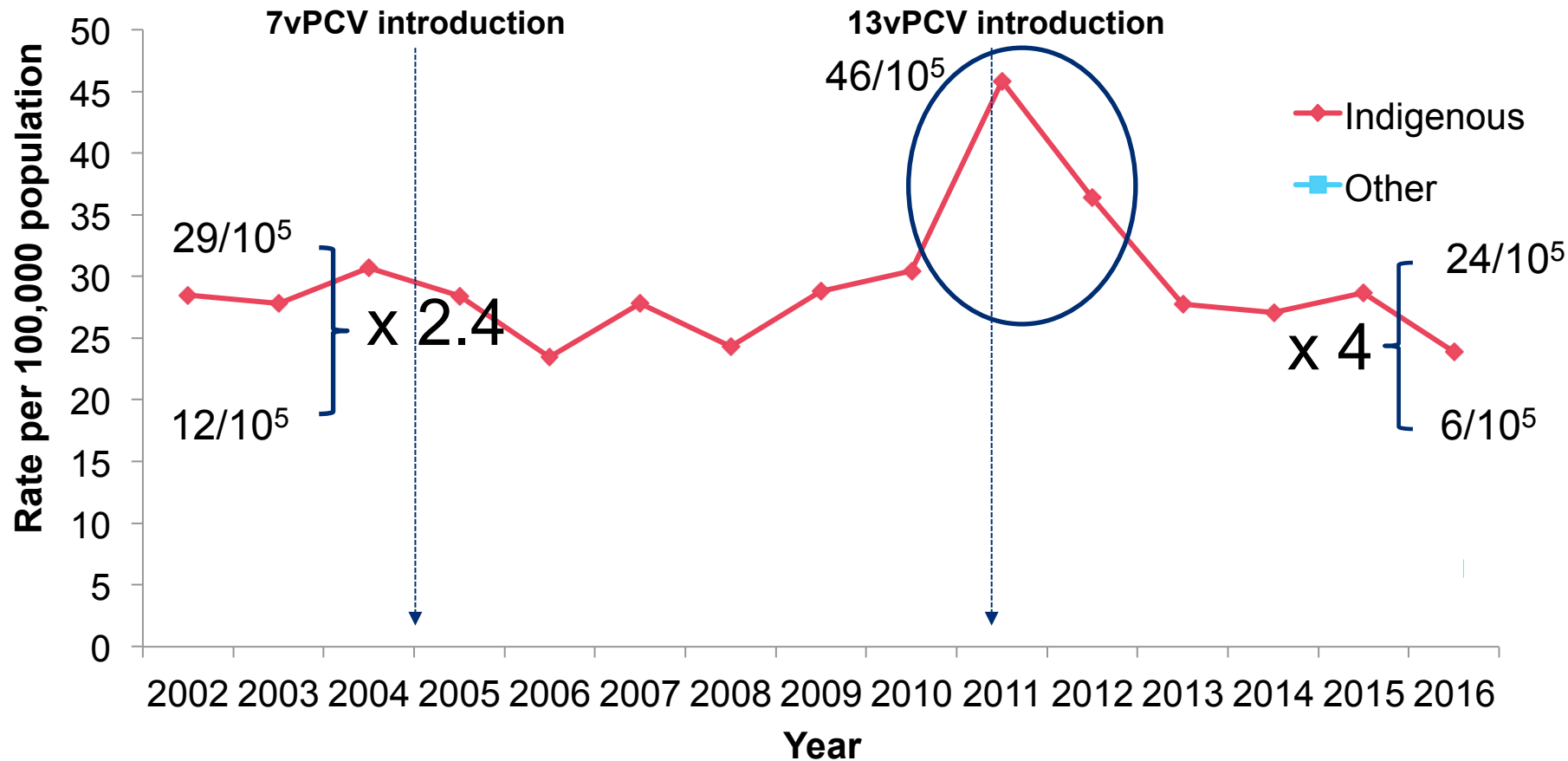
Talk outline

- Burden of PD
 - IPD epi changes overtime, situation post 13vPCV era
 - National lab based enhanced passive surveillance
 - Pn CAP
 - No surveillance for non-invasive PnCAP (but substantially greater burden)
 - ICD coded hospitalisations commonly used
 - Few published studies of CAP hospitalisations
- Prevalence of RFs for PD in Indigenous & non-Indigenous
- Concluding remarks – what all this means

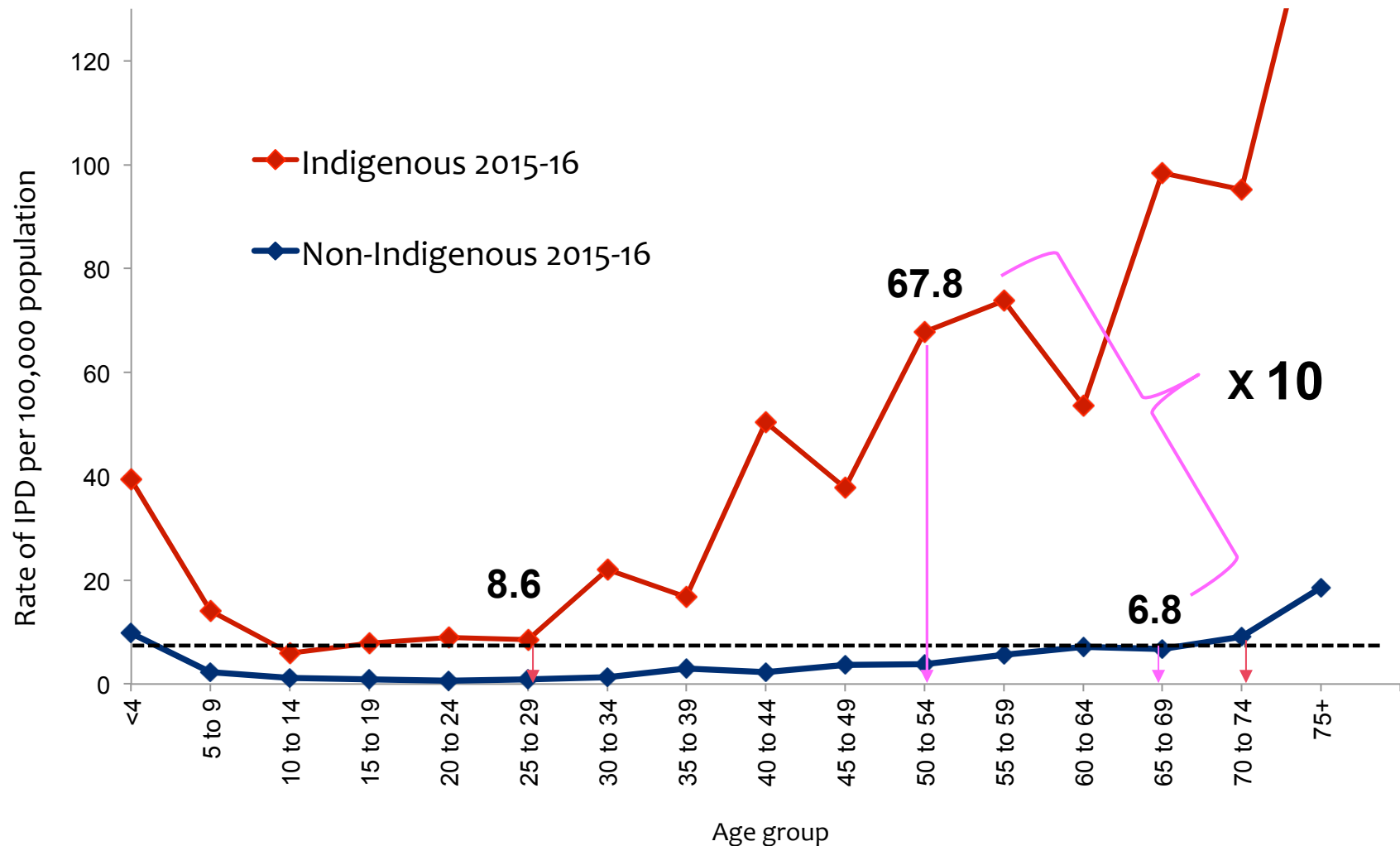
Invasive pneumococcal disease – surveillance data

The background of the slide is a solid orange color. It features several large, semi-transparent orange circles of varying sizes. Overlaid on these circles and the background are numerous small, semi-transparent orange squares, some of which are arranged in a grid-like pattern, while others are scattered randomly.

Total IPD incidence 2002-2016, Indigenous versus non-Indigenous



Distribution of IPD incidence rates across the age span in Indigenous & non-Indigenous



Serotype 1 outbreak in Indigenous population in North & Central Australia

Figure 2. Map of Australia showing the geographical areas (in yellow) affected by the ST1 outbreak.



Figure 6. ST1 IPD rates in the outbreak regions, by Indigenous status, 2010-2013.

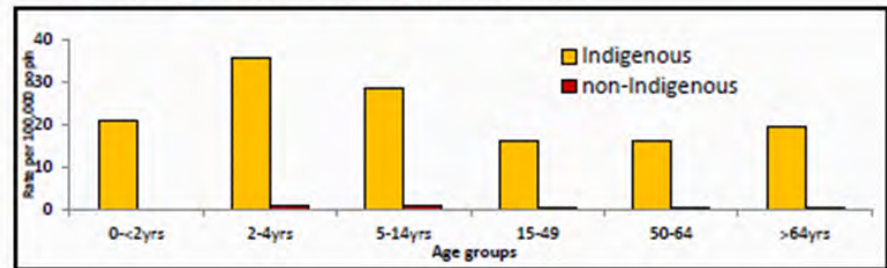
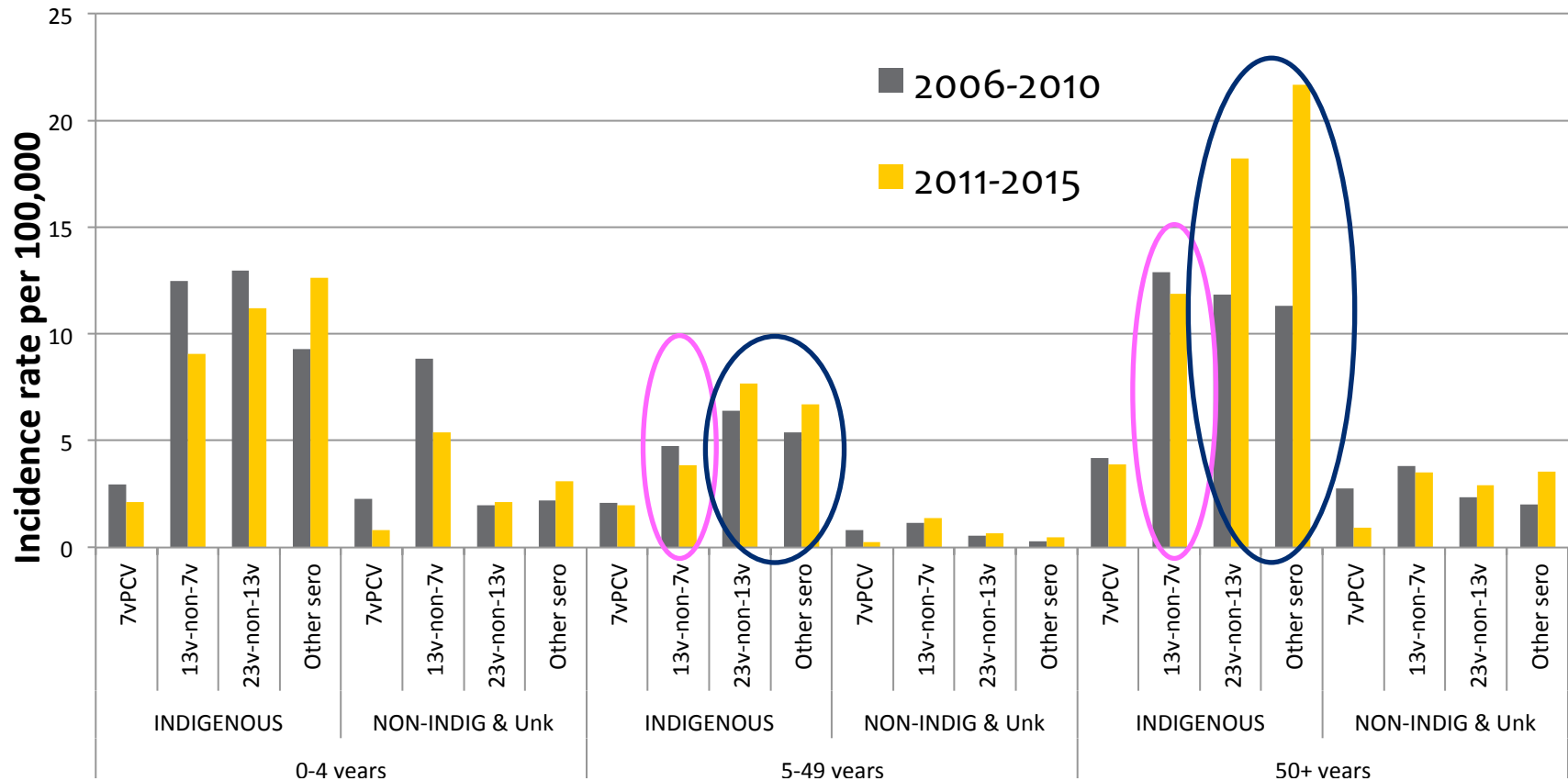


Figure 4. ST1 IPD number and rates in the outbreak regions compared to the rest of Australia, before, during and after the outbreak.

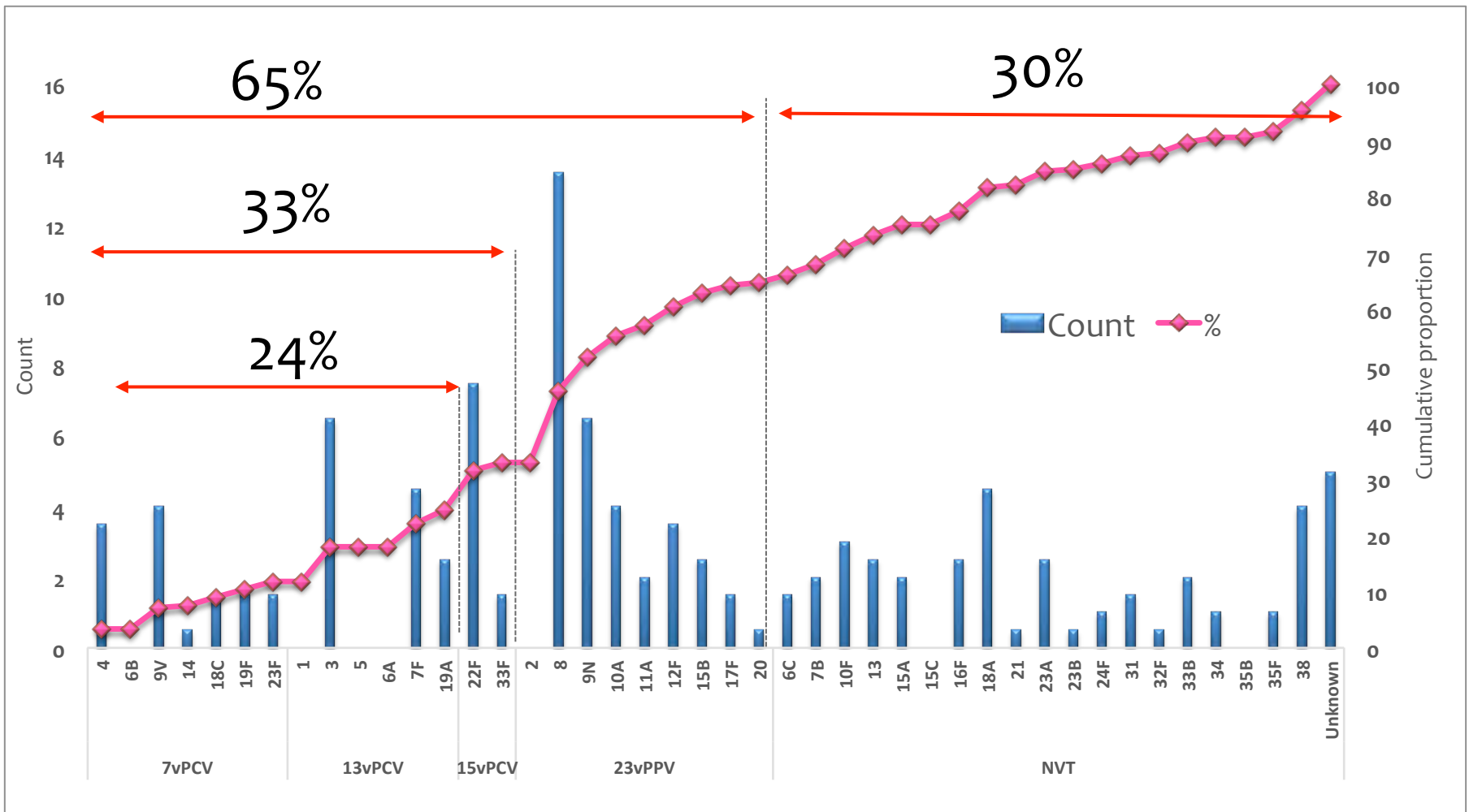
Years before, during and after outbreak	All outbreak regions		Non-outbreak regions (rest of Australia)		RR		95% CI
	(n)	Rate	(n)	Rate			
Before (2003 to 2009)	46	0.24	197	0.16	1.50		1.07-2.09
During (2010 to 2013)	245	1.93	99	0.13	15.10		11.9-19.3
After (2014)	7	0.21	3	0.01	13.92		3.18-83.43
Peak year (2011)	130	4.17	26	0.14	30.70		20.09-48.89

IPD by vaccine serotype categories (excluding ST 1), pre/post 13vPCV



What proportions of IPD are due to various vaccine types

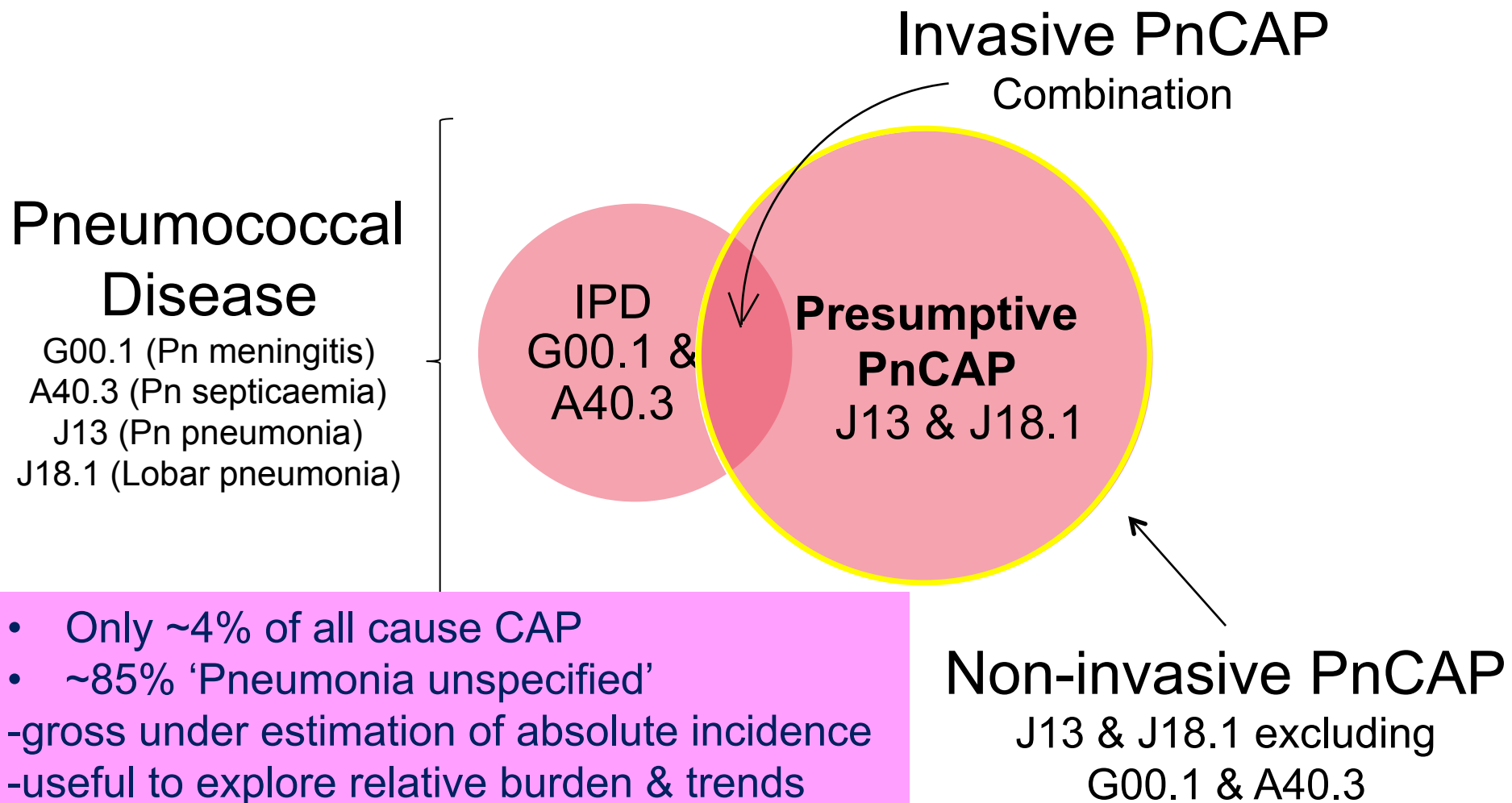
– 2015 & 16 data, Indigenous age ≥ 25 yrs



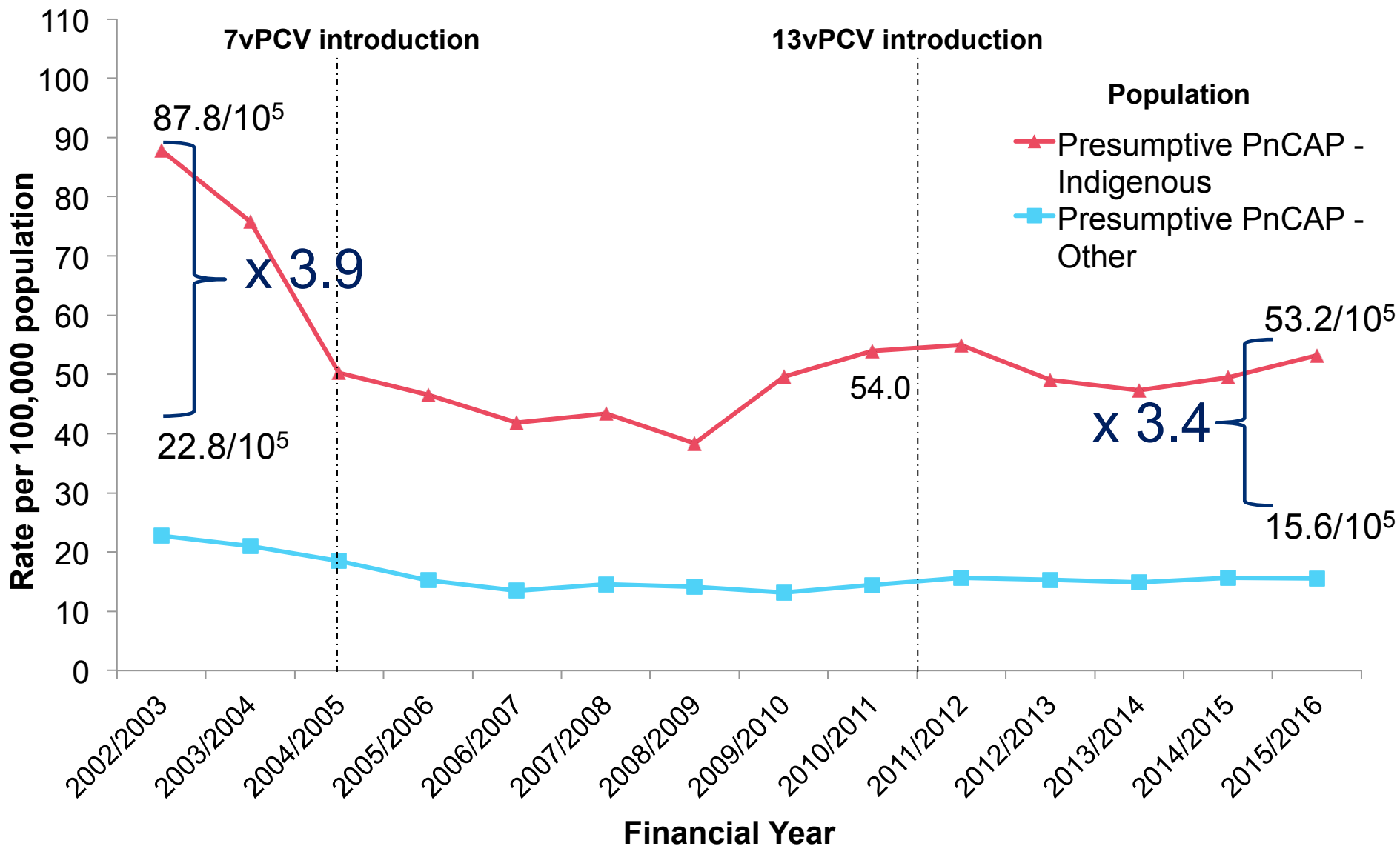
The background of the slide is a solid orange color. It features a pattern of large, semi-transparent orange circles and smaller, semi-transparent orange squares. The circles are of varying sizes and are scattered across the slide. The squares are smaller and are clustered together in some areas, particularly on the left side, where they form a dense, textured pattern. The overall effect is a modern, abstract design.

Pneumococcal community acquired pneumonia – ICD coded hospitalizations data

Presumptive pneumococcal pneumonia based on ICD-10-AM codes



Trends of presumptive PnCAP hospitalisations by Indigenous status, 2002/2003-2015/2016.



Proportion of all CAP due to Pneumococcus in Australian adults


Systematic review

Determining the contribution of *Streptococcus pneumoniae* to community-acquired pneumonia in Australia

J Kevin Yin^{1,2}, Sanjay H Jayasinghe^{1,2}, Patrick G Charles³, Catherine King¹, Clayton K Chiu¹, Robert I Menzies⁴, Peter B McIntyre¹

- Proportion of CAP attributable to pneumococcus identified by any method decreased steadily from 26.4% in 1987-88 to **13.9%** in 2004-06 (P . 0.001).
- no statistically significant difference in the proportion of CAP attributable to pneumococcus among non-Indigenous compared to Indigenous adults.

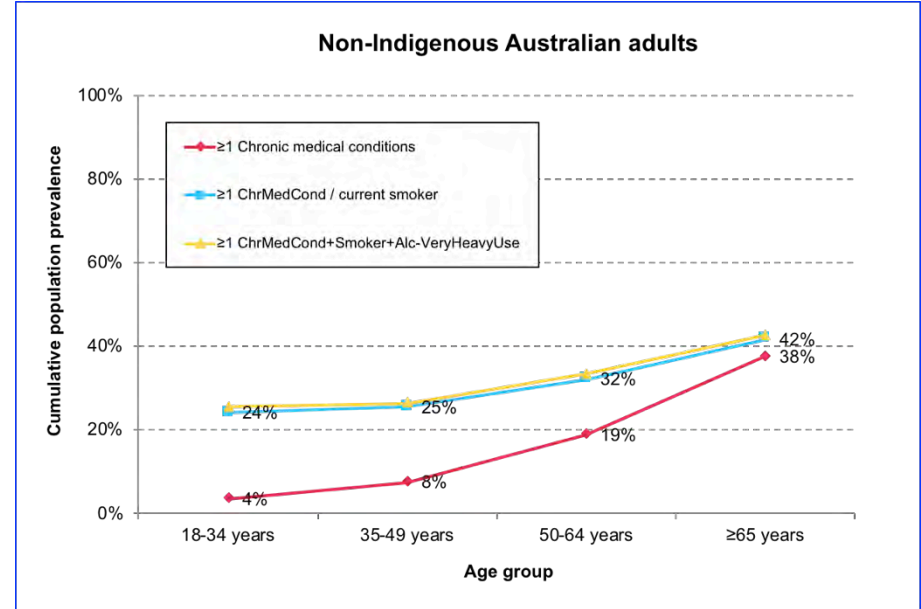
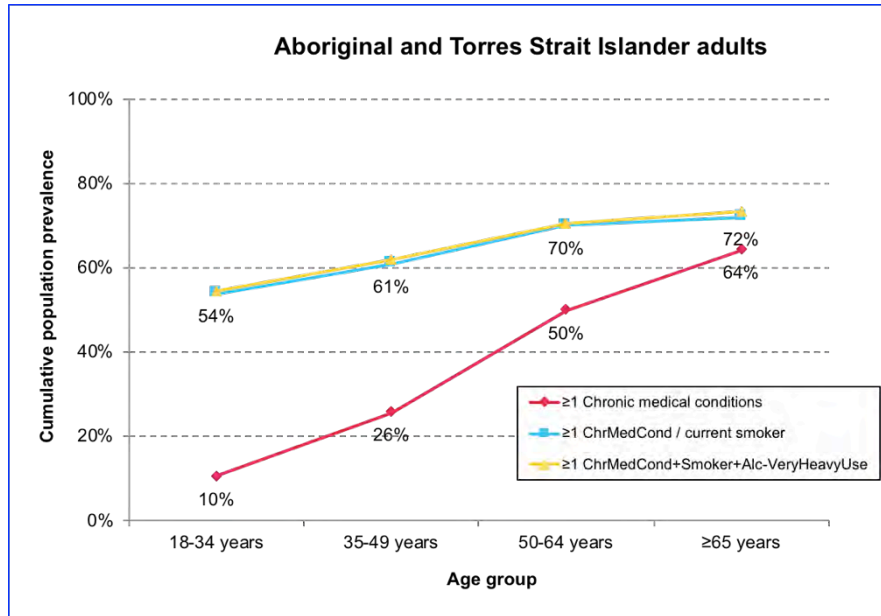
‘Our study also revealed that the disease burden and aetiology of CAP among Indigenous people is understudied. This warrants further, robust research, particularly considering the continued health inequity between Indigenous and non-Indigenous Australians in relation to CAP’



Population prevalence of risk factors for pneumococcal disease

-2011-13 Australian Health Survey & 2012-13
Australian Aboriginal and Torres Strait Islander
Health Survey

Prevalence of risk factors for pneumococcal disease, Indigenous vs non-Indigenous



Source: 2011-13 Australian Health Survey & 2012-13 Australian Aboriginal and Torres Strait Islander Health Survey

- Higher risk factor prevalence among Indigenous adults across age groups
- Incremental contribution from behavioural risk factors is substantial, especially among young adults

Discussion & conclusions

- PD remains a significant health burden in adult Indigenous Australians despite funded vaccination for over 2 decades
 - Disparity in Indigenous versus non-Indigenous is increasing
 - IPD incidence starts increasing from young adulthood in Indigenous
- Possible reasons for ongoing high PD burden include:
 - Higher prevalence of underlying RFs
 - Lesser indirect effects from infant program
 - Higher density of nasopharyngeal colonization in children and adults
 - Serotype replacement due to greater ST diversity
 - Sub-optimal vaccine coverage
 - ?Lesser VE

Discussion & conclusions

- Improved vaccine coverage and timeliness would likely help reduce vaccine preventable burden of PD in Indigenous adults
- Given high PD burden & RF prevalence in young Indigenous adults - rethink vaccination strategy
- However, vaccination will, at best, have moderate impact on PD in Indigenous adults
 - Non-vaccine related interventions must be explored and prioritised to further reduce ongoing burden of IPD in Indigenous Australians

Acknowledgements

- Peter McIntyre - NCIRS
- Kelley Meder - NCIRS
- Clayton Chiu - NCIRS
- Cyra Patel - NCIRS
- Heather Cook- NT Dept. of Health
- Kevin Yin- Sanofi (Ex NCIRS)
- Kate Pennington - Commonwealth Dept. of Health
- Communicable Diseases Network Australia