



Impact of PCV13 on Carriage

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Acknowledgements

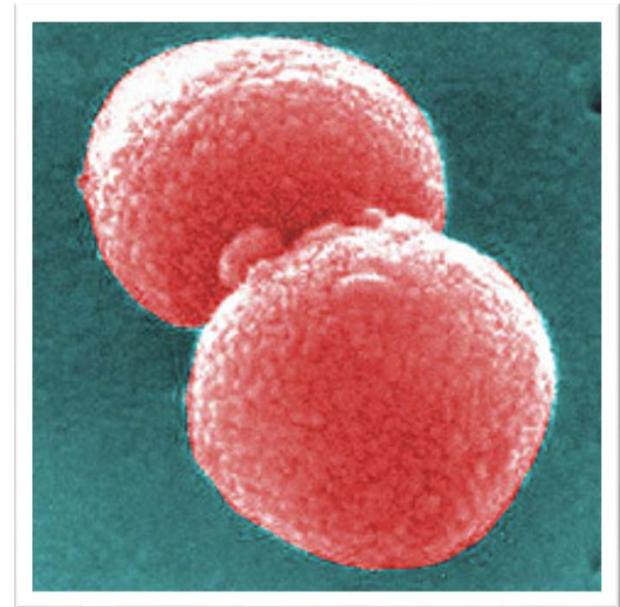
- Navajo and White Mountain Apache tribal members
- CAIH Faculty and Staff
- IHS Clinical and Lab partners
- Navajo Nation IRB
- White Mountain Apache Health Board and Tribal Council
- Phoenix Area IHS IRB

Learning Objectives

1. Characterizing pneumococcal carriage helps explain trends in pneumococcal disease
2. Coverage with pneumococcal conjugate vaccine (PCV) is high among children <5 years of age
3. Some PCV-type pneumococcal carriage persists in children and adults

What is *Streptococcus pneumoniae*?

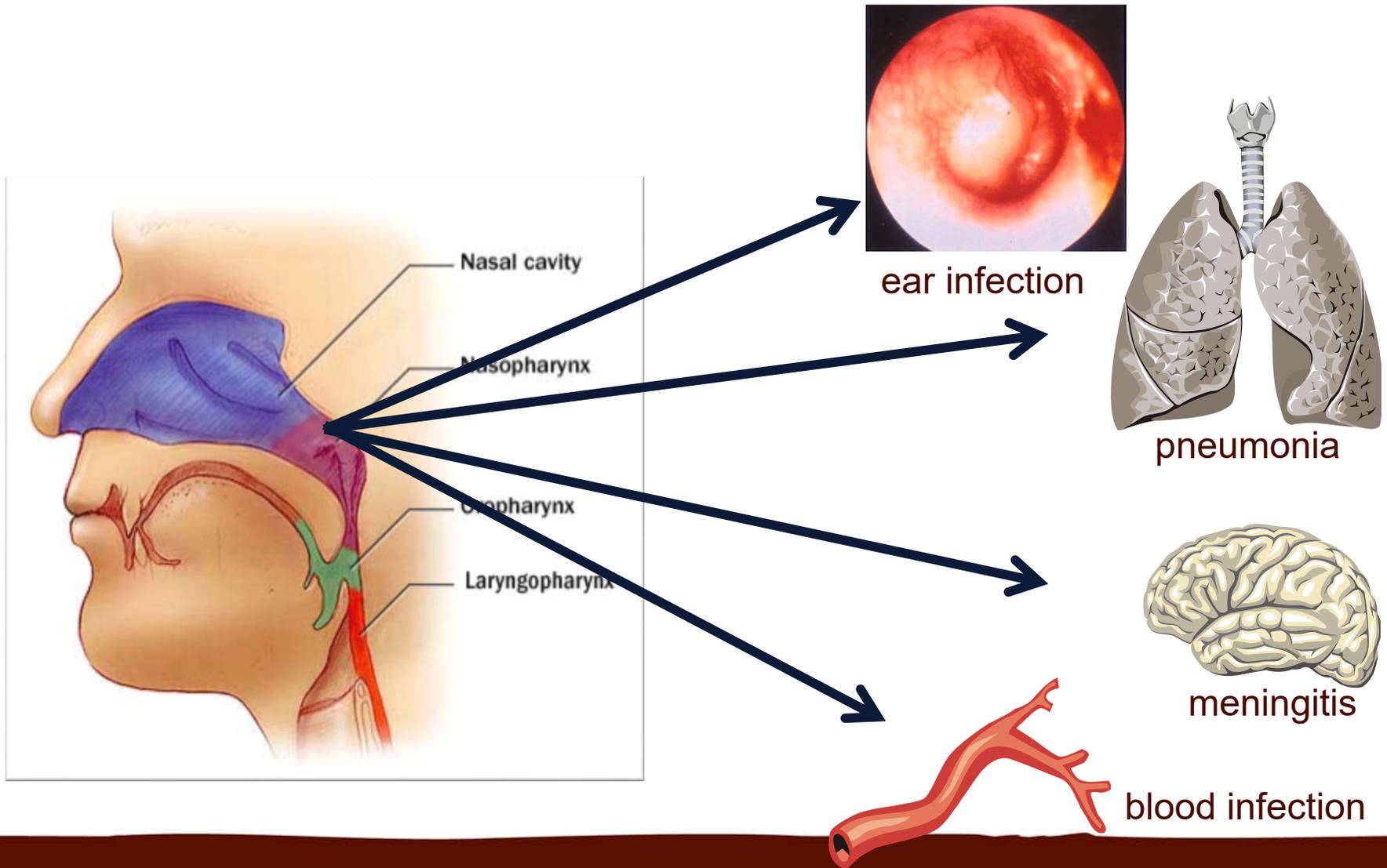
- A “germ” or bacteria
- More than 90 types
- Types differ by the type of sugar coating on the surface of the bacteria
- Can cause serious disease
(pneumonia, meningitis, blood infection)



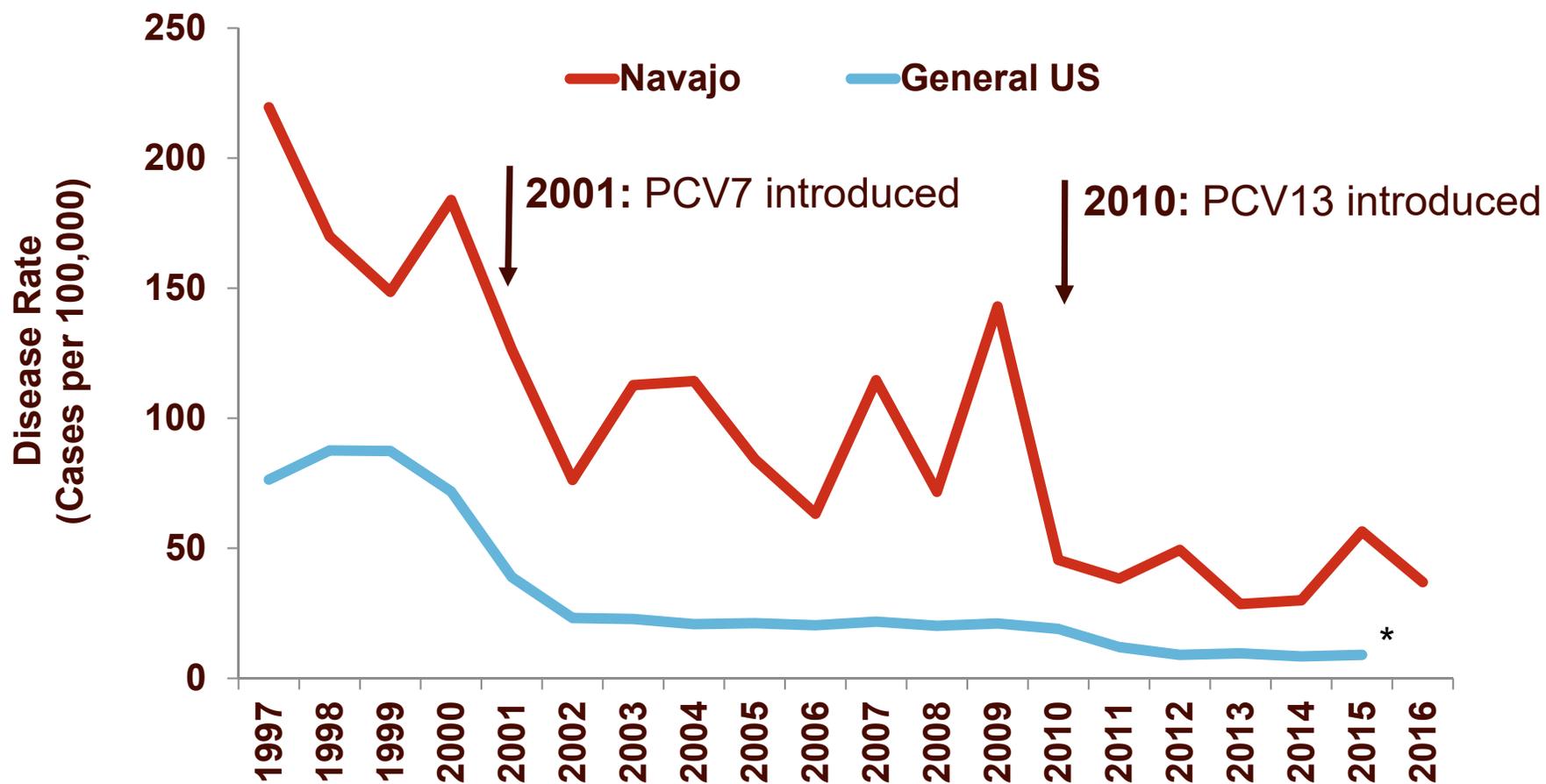
How does someone get pneumococcus?



Why do we study pneumococcal carriage?



High burden of pneumococcal disease for Navajo children <5 years old

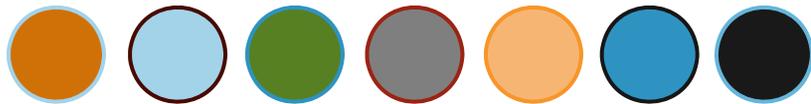


* US data available only through 2015

PCV7: a vaccine for pneumococcus

- PCV7 (Prevnar), available in 2000
- Given to children <5 years old
- Prevents carriage of PCV7 types

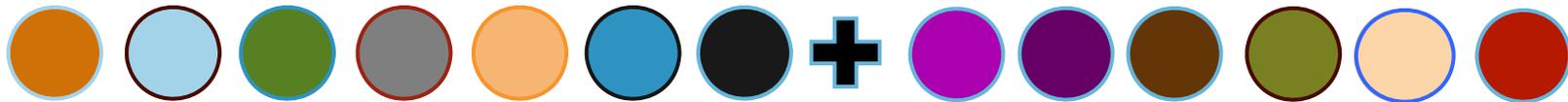
PCV7



PCV13: a new vaccine for pneumococcus

- Contains PCV7 types plus 6 additional types
- PCV13 use began 2010 for children
- Given to children <5 and adults ≥ 65 years of age (starting in August 2014)

PCV7 (2000)



PCV13 (2010)

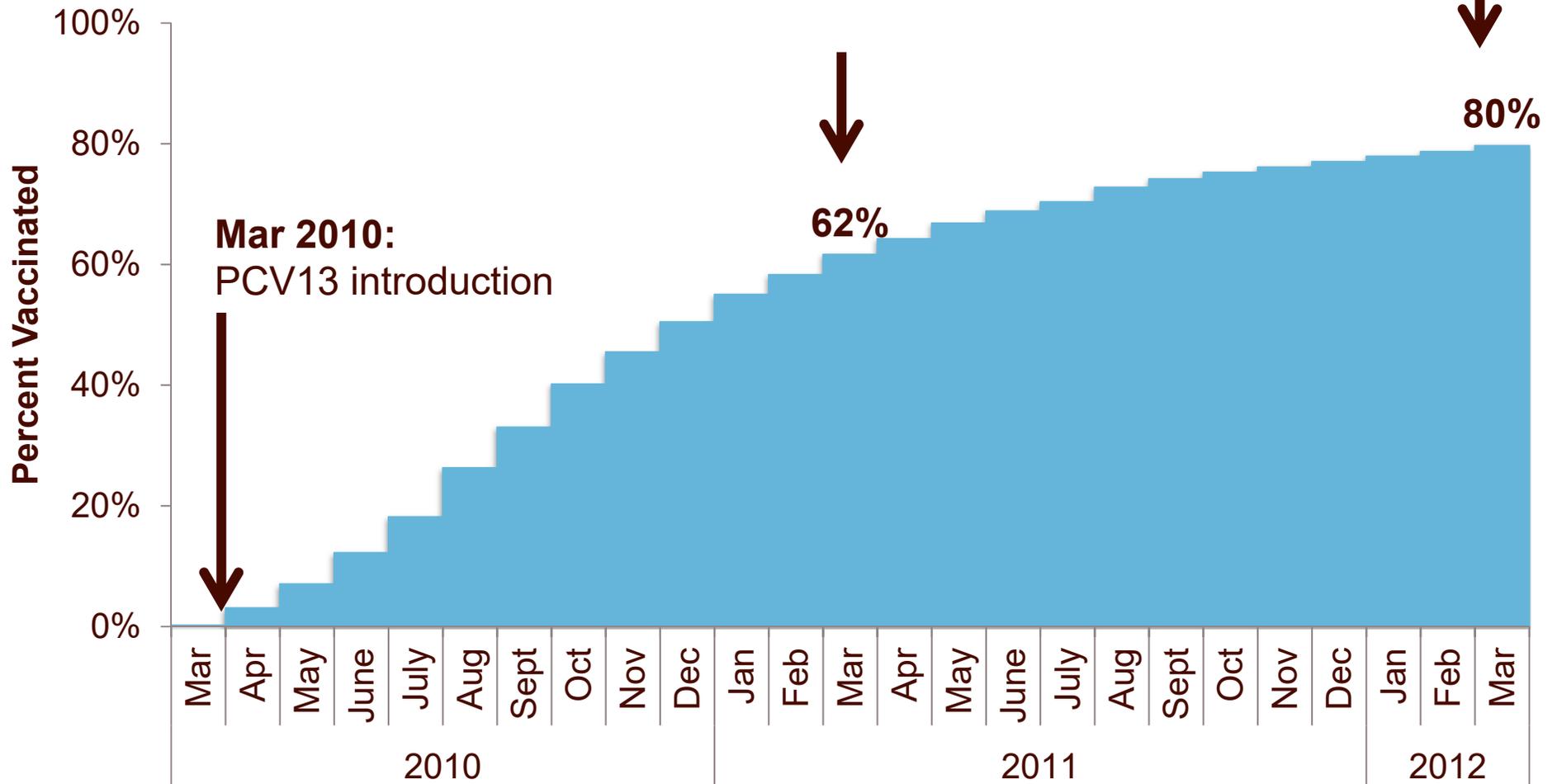
PCV13 Study – Part 1: Objectives

1. Track uptake of PCV13 into the community
2. Measure impact of PCV13 on carriage of PCV13-types before and after vaccine introduction

PCV13 Study – Part 1: Study design and activities

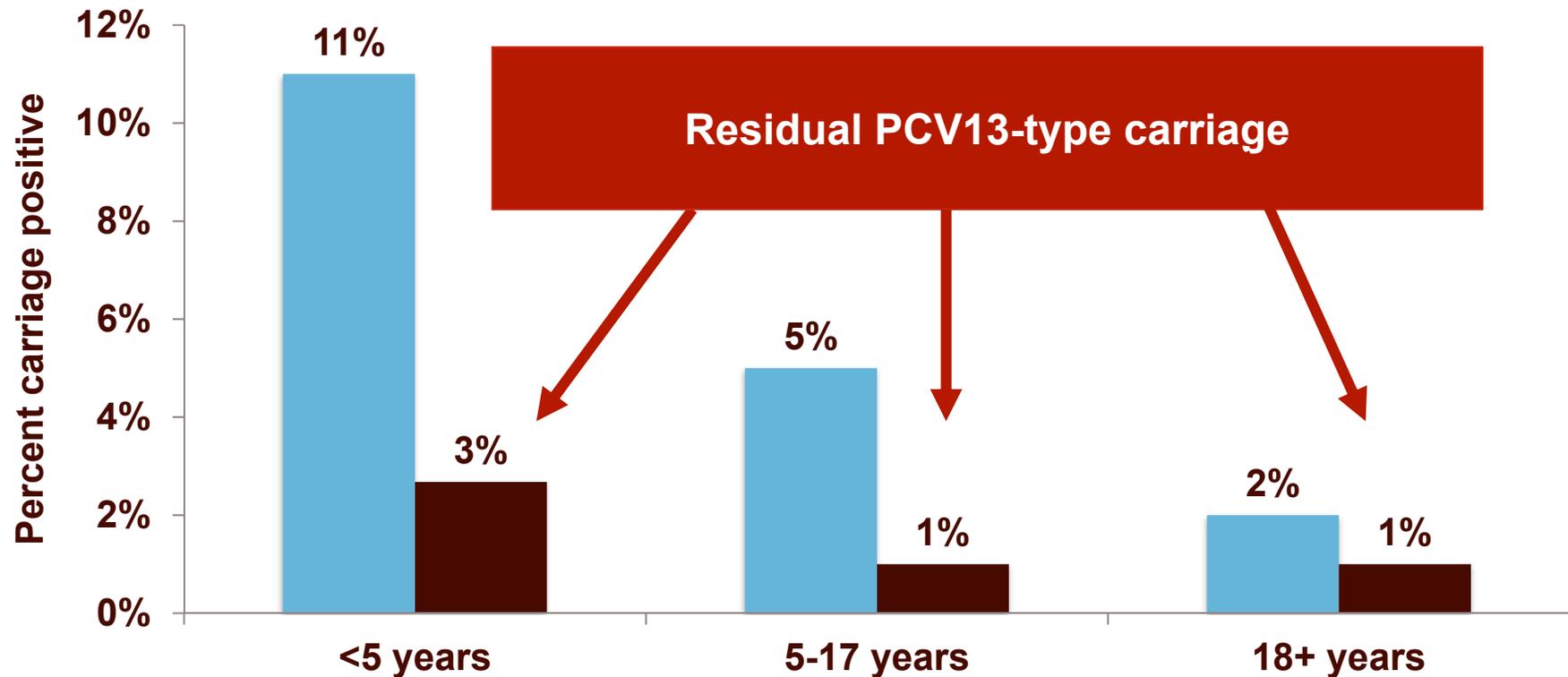
- Enrollment period: January 2010 – March 2012
- Enrollment population: Convenience sample of all ages
- Study sites:
 - Chinle, Fort Defiance, Gallup, Shiprock (Navajo)
 - Whiteriver (White Mountain Apache)
- Study activities:
 - Administer questionnaire (demographics, risk factors)
 - Collect nasopharyngeal (NP) swab
 - Review medical chart (chronic medical conditions, PCV history)
 - Culture and type pneumococcus from NP swab

Part 1 Results: PCV13 uptake after introduction in 2010, children <5 years old



Part 1 Results: PCV13-type carriage in children and adults after PCV13 introduction

Percent of Navajo and Apaches who are PCV13-type positive before and after PCV13 use began



Question:

After five years of PCV13 use, does PCV13-type carriage continue to persist in the population?

“PCV13-types”
- types only in PCV13 -

1

3

5

6A

7F

19A

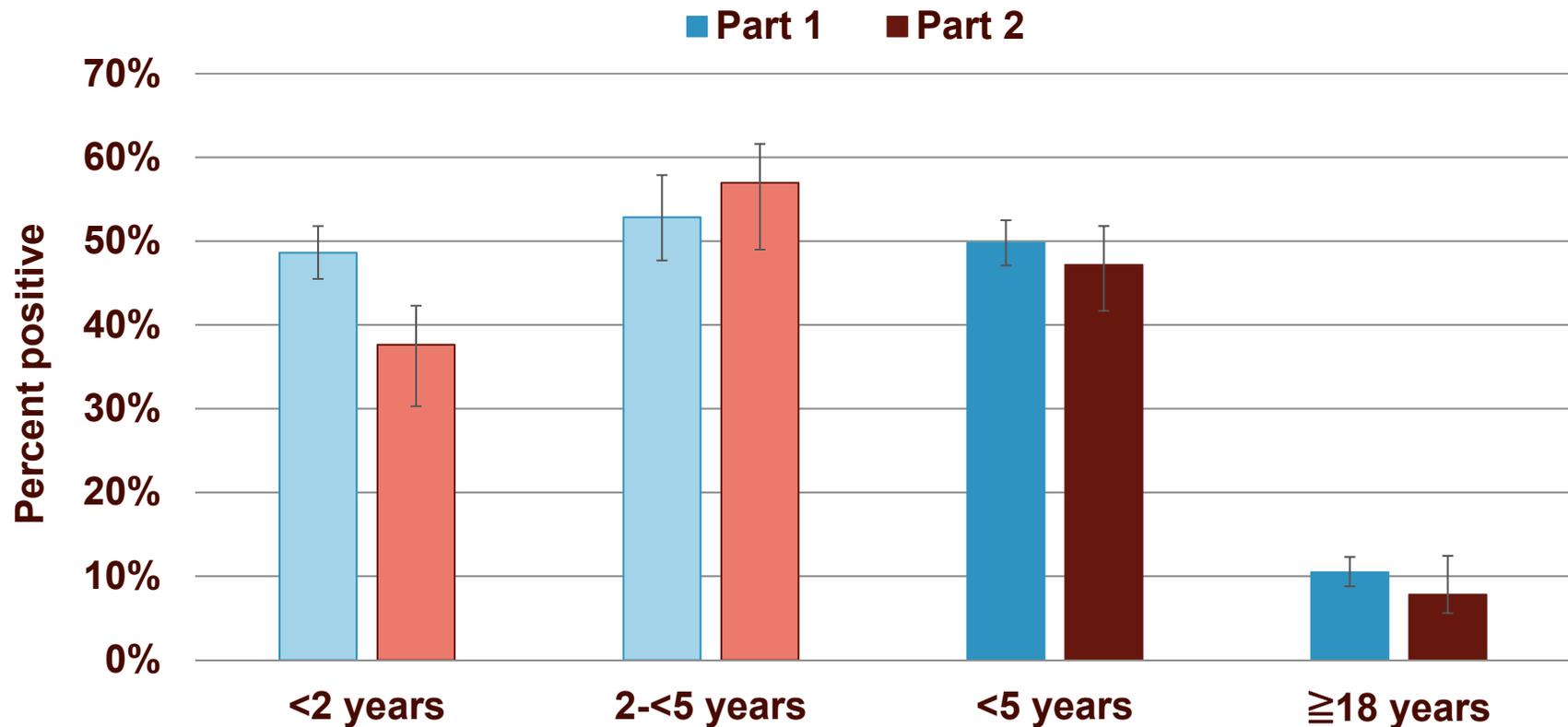
PCV13 Study – Part 2: Study design and activities

- Enrollment period: October 2015 – September 2016
- Enrollment population: convenience sample of children <5 years and adults ≥ 18 years
- Study sites:
 - Chinle, Fort Defiance, Gallup, Shiprock (Navajo)
 - Whiteriver (White Mountain Apache)
- Activities:
 - Consent participant
 - Administer questionnaire (demographics, risk factors)
 - Collect nasopharyngeal (NP) swab
 - Review medical chart (underlying conditions, PCV history)
 - Culture and type pneumococcus from NP swab

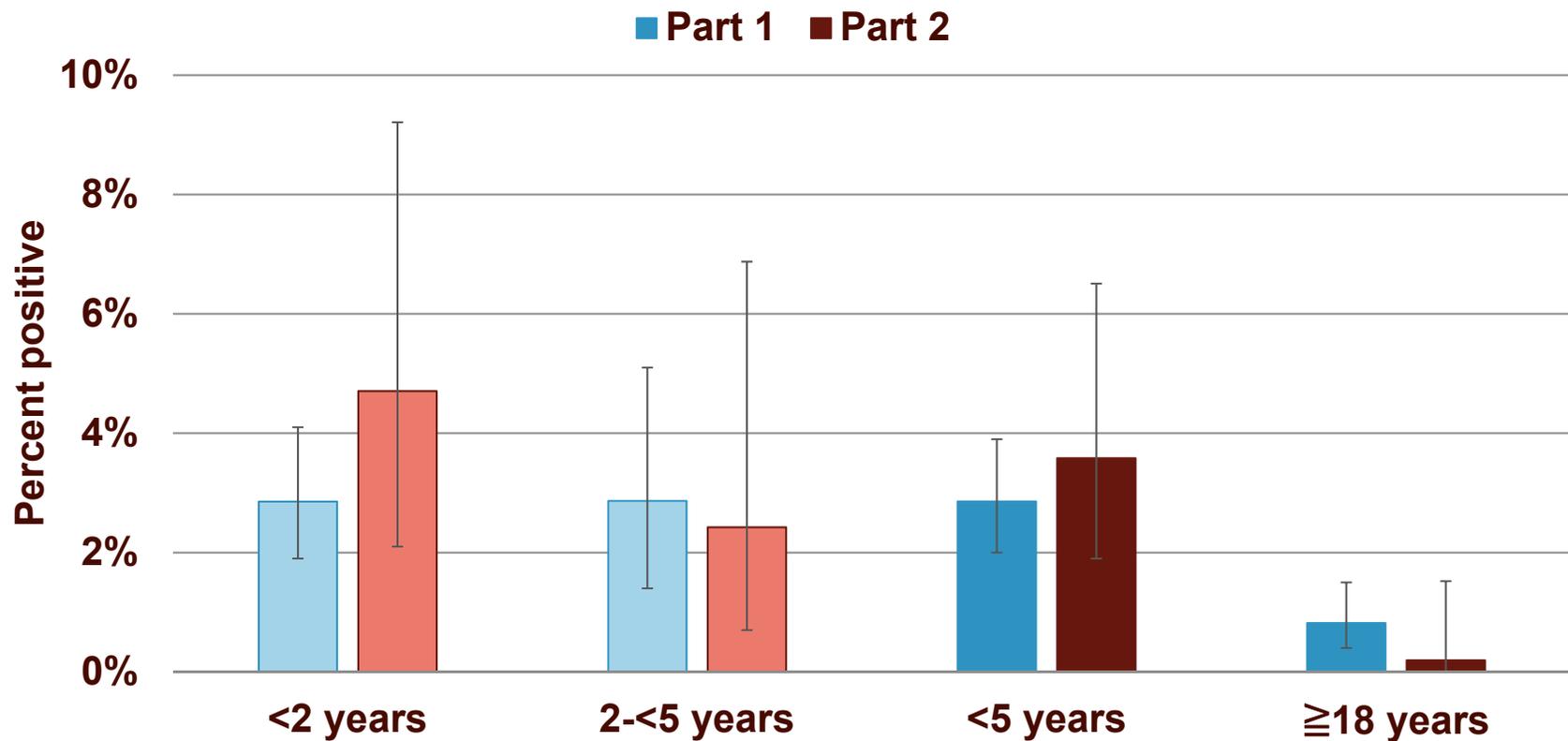
Pneumococcal carriage: PCV13 Study - Part 2

Age groups	Total swabs	Pneumococcal positive, n (%)	PCV13-type positive, n (%)
<2 years	170	64 (38)	8 (5)
2-<5 years	165	95 (58)	4 (2)
<5 years	335	159 (47)	12 (4)
18-39 years	176	18 (10)	1 (0.6)
40-64 years	172	13 (7)	0 (0)
≥65 years	165	9 (5)	1 (0.6)
≥18 years	513	40 (8)	2 (0.4)

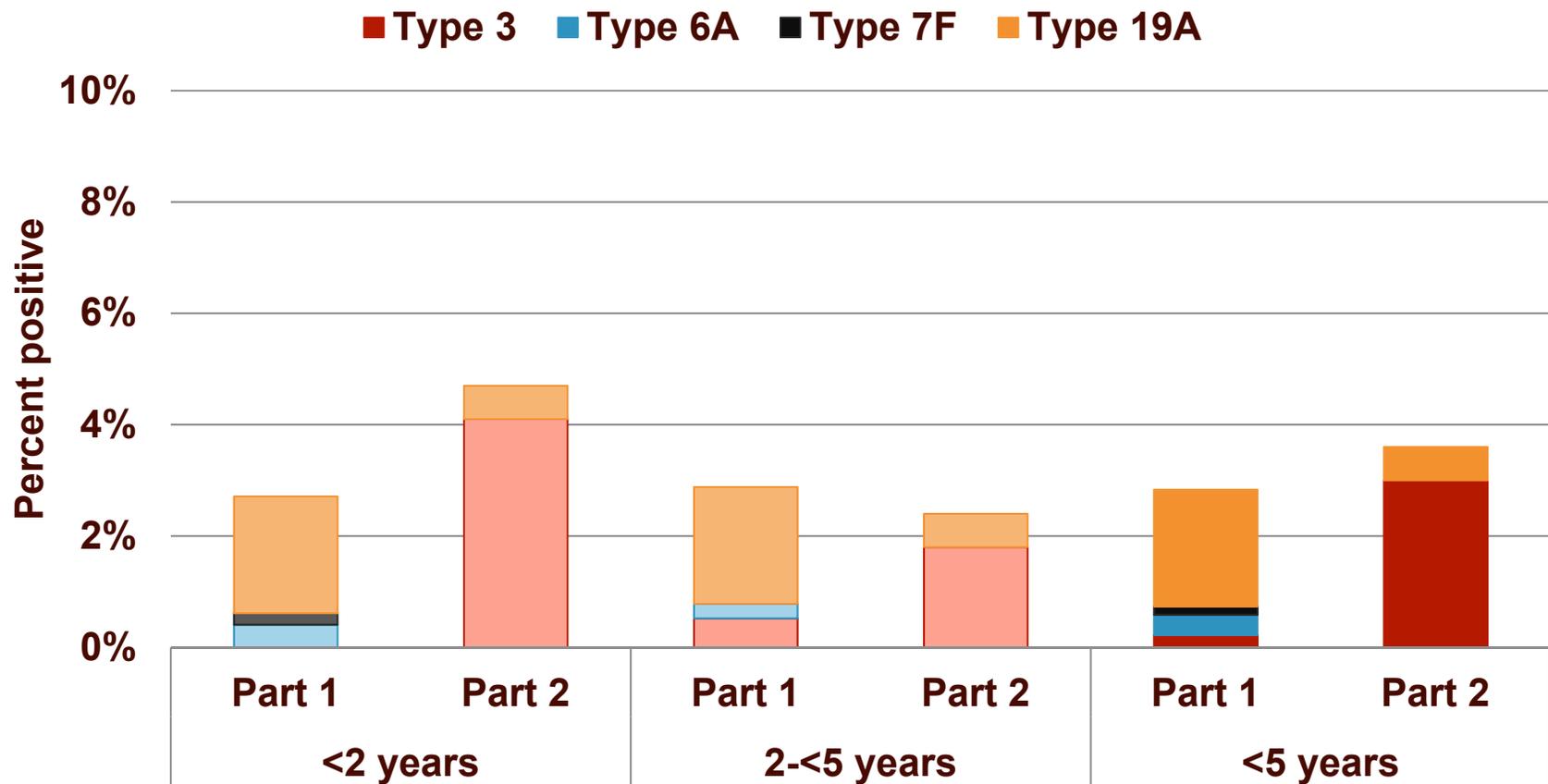
Comparison of pneumococcal carriage: PCV13 Study - Part 1 vs. Part 2



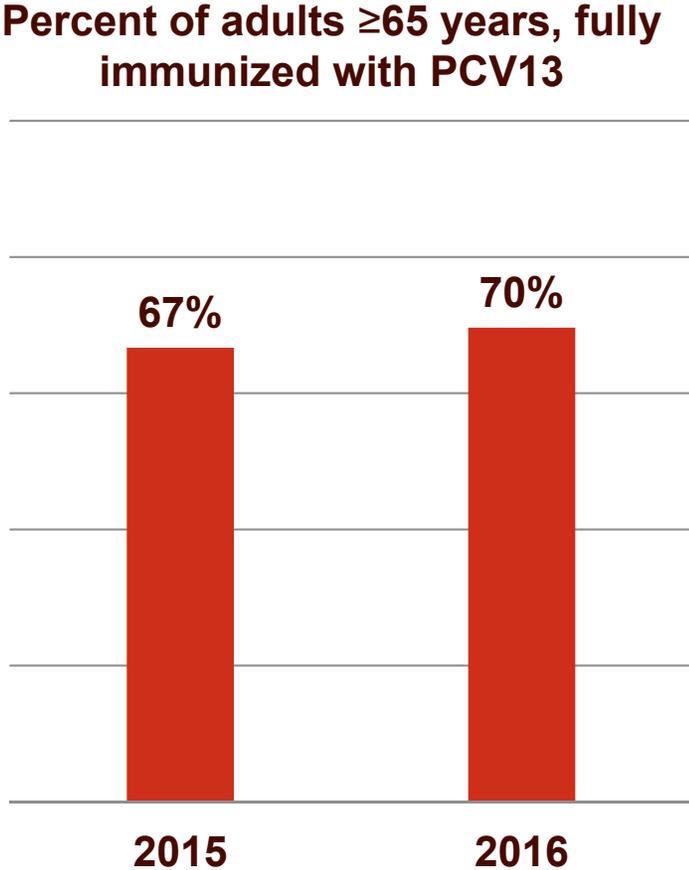
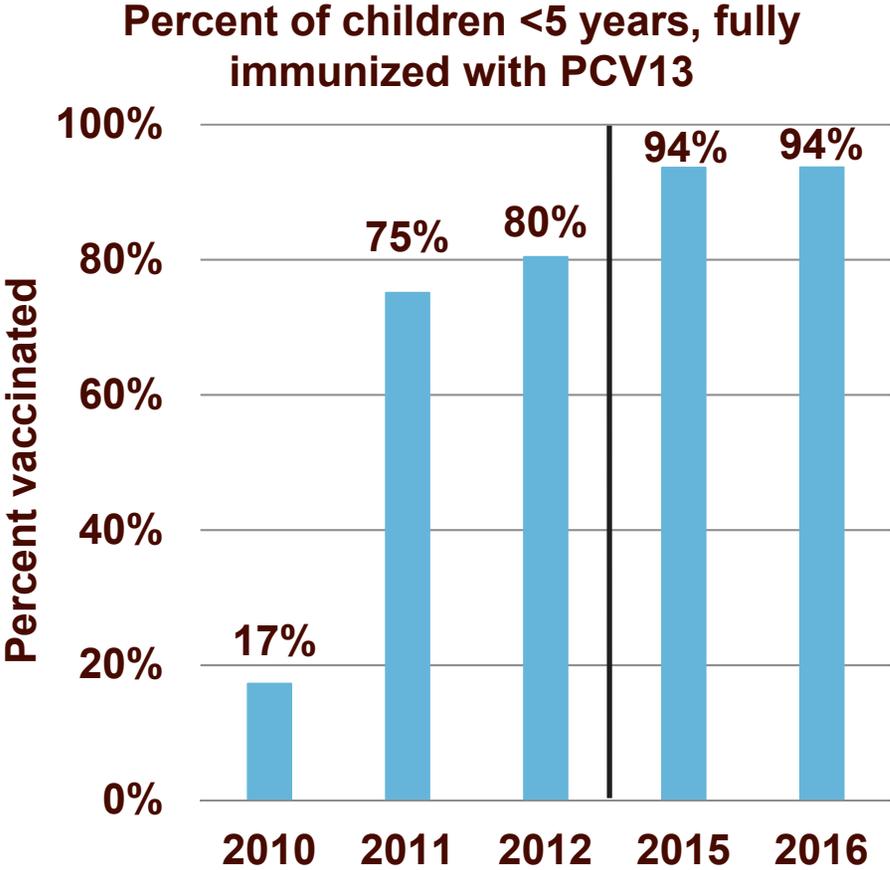
Comparison of PCV13-type carriage: PCV13 Study - Part 1 vs. Part 2



Comparison of individual PCV13-type carriage: PCV13 Study - Part 1 vs. Part 2



PCV13 use among PCV13 Part 2 participants <5 and ≥65 years



Conclusions

- Since PCV use began in 2000, PCV-type carriage has declined
- Residual PCV13-type carriage exists after five years of vaccine use at high coverage
- If PCV13-type disease persists, alternative strategies may be needed to eliminate carriage of residual PCV13-types

Thank you!



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