

Update on Effectiveness and Impact of PCV13 use among U.S. Children

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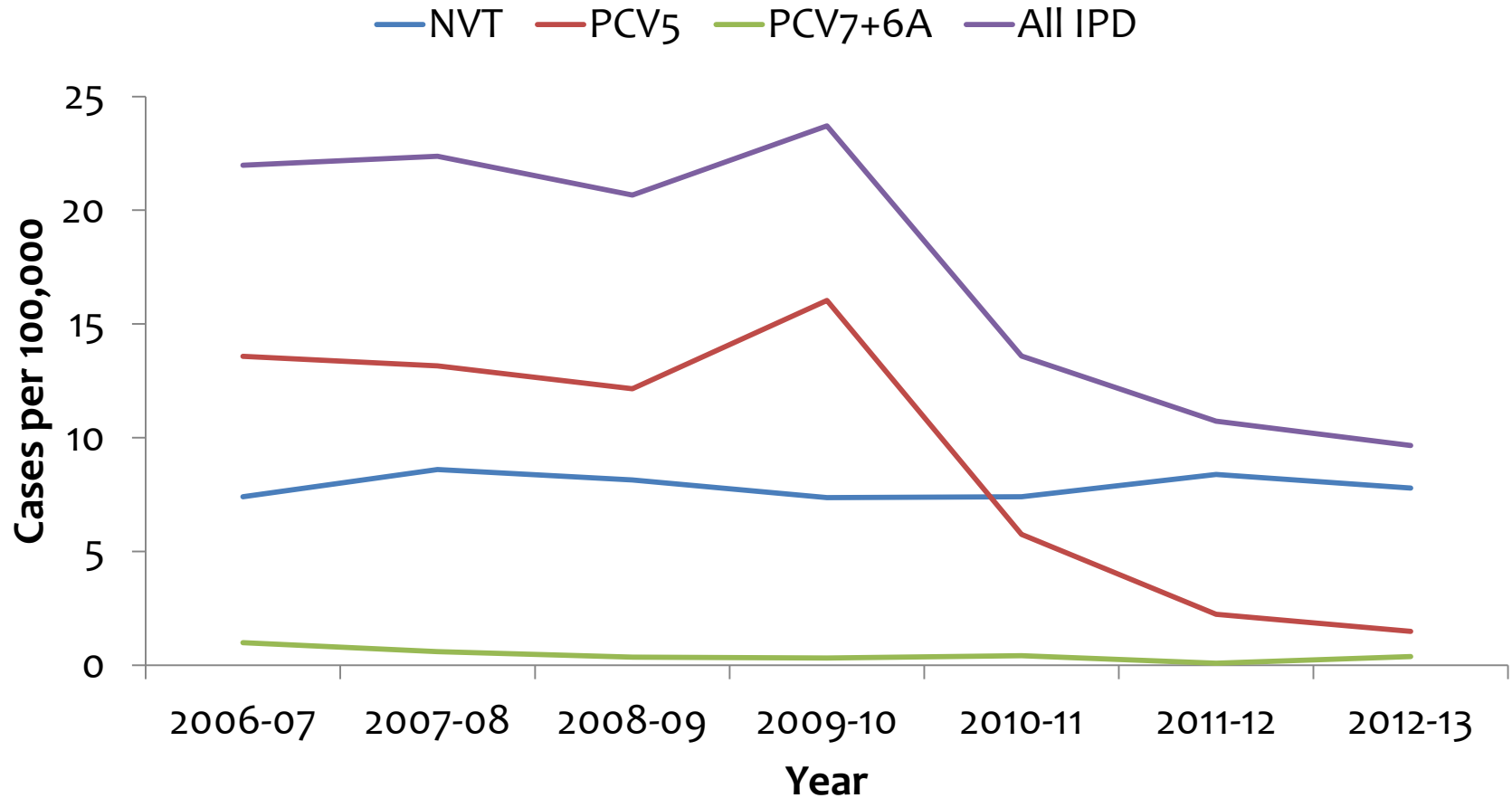
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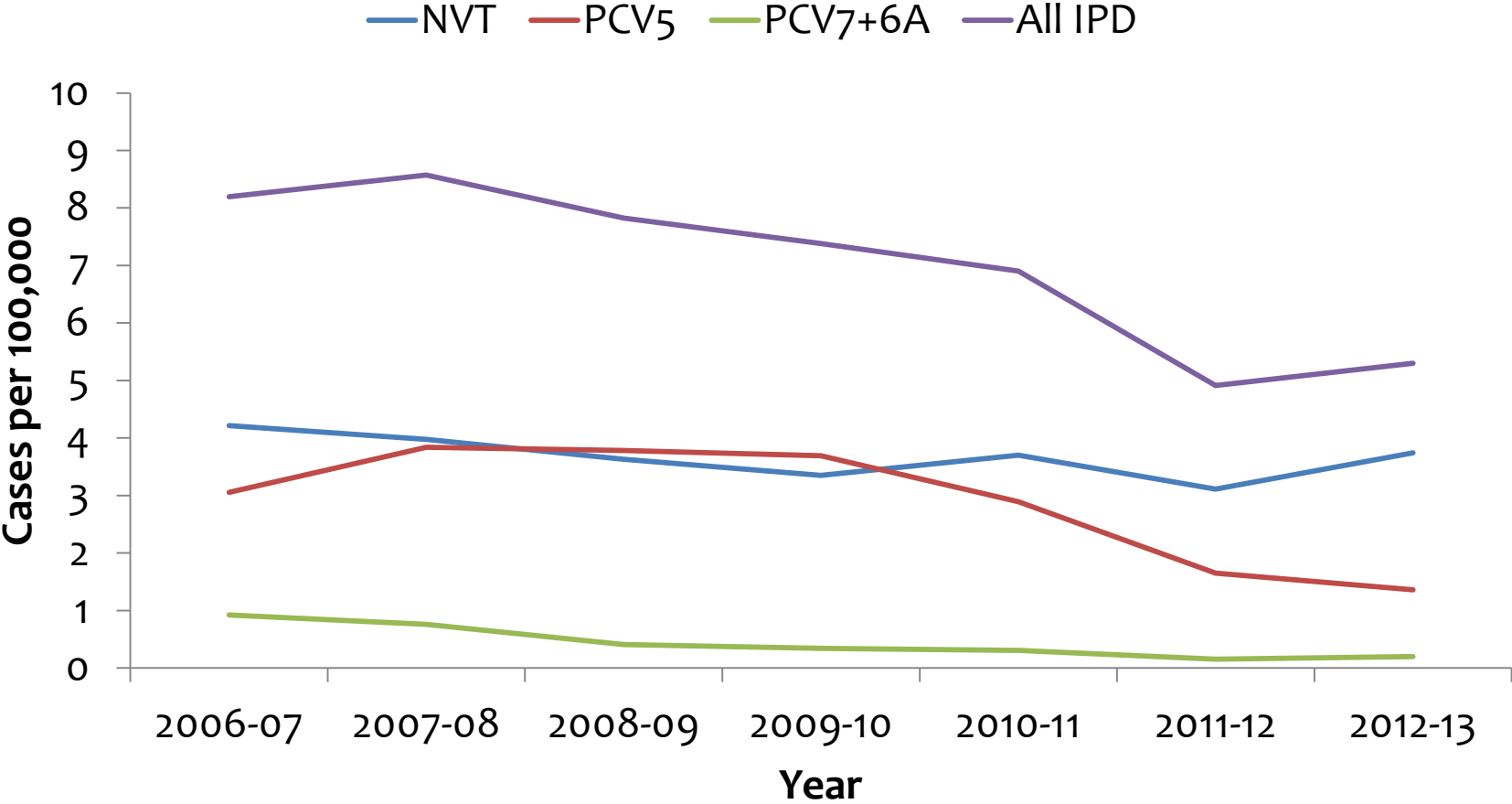
Methods

- CDC monitors invasive pneumococcal disease (IPD) using active, population-based surveillance conducted in 10 areas around U.S. (Active Bacterial Core surveillance, ABCs)
- Evaluated rates of IPD over time
- Focused on 5 PCV13 types not affected by PCV7
 - PCV7 includes serotypes 4, 6B, 9V, 14, 18C, 19F, 23F
 - Serotype 6B antigen of PCV7 provides cross-protection against serotype 6A
 - Serotype 6A is included in PCV13
- Also evaluated for evidence of serotype replacement
- Individual-level vaccine effectiveness (VE) evaluated among children 2-59 months old using case-control method

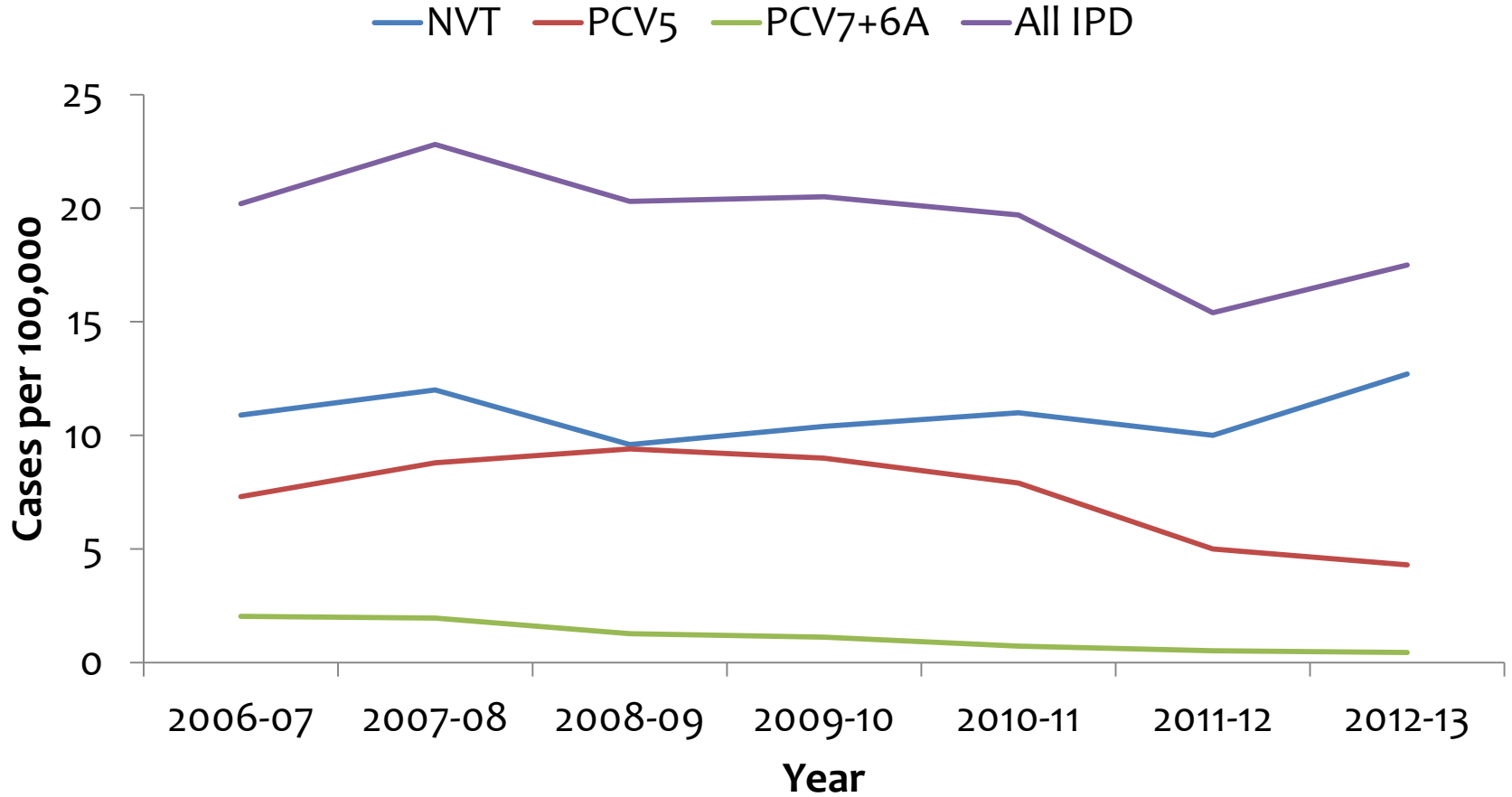
Annual Trends in IPD among Children <5 years old, 2006-13



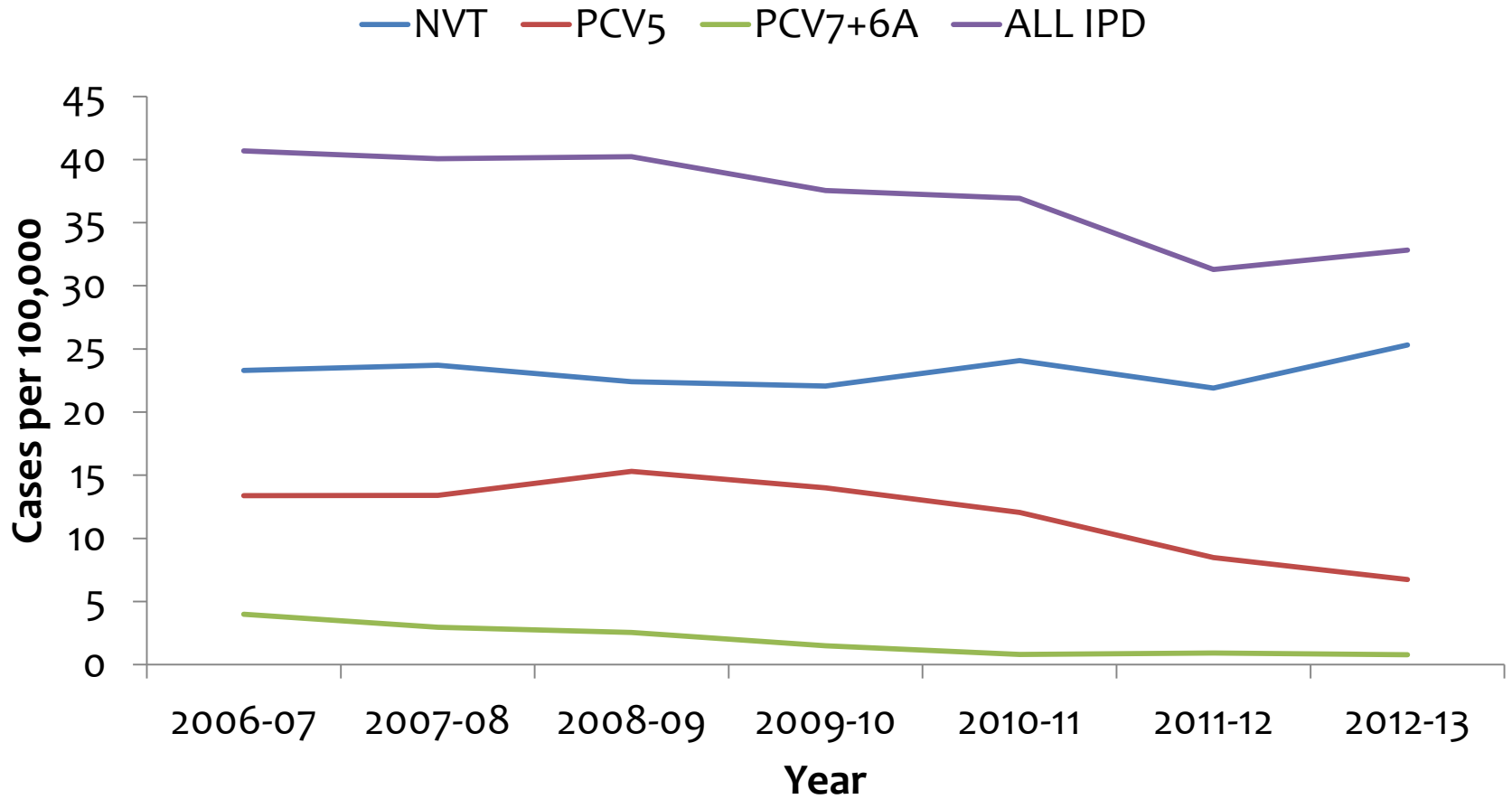
Annual Trends in IPD among Adults 18-49 years old, 2006-13



Annual Trends in IPD among Adults 50-64 years old, 2006-13



Annual Trends in IPD among Adults ≥ 65 years old, 2006-13



Percent Change in PCV5-type IPD, Comparing Observed Cases to Cases Expected in Absence of PCV13, by age

Age group, years	Percent Change in Rate (95%IE)		
	2010-11	2011-12	2012-13
<5	-66 (-61, -70)	-88 (-86, -89)	-93 (-91, -94)
5-17	-35 (-21, -45)	-59 (-48, -66)	-75 (-67, -80)
18-49	-33 (-26, -38)	-64 (-60, -68)	-72 (-69, -75)
50-64	-23 (-18, -28)	-54 (-50, -57)	-62 (-59, -65)
≥65	-23 (-13, -31)	-46 (-39, -52)	-58 (-52, -64)

Continued reductions in vaccine-type IPD in all age groups during first 3 years after PCV13 introduction.

Percent Change in Non-PCV13-type IPD, Comparing Observed Cases to Cases Expected in Absence of PCV13, by age

Age group, years	Percent Change in Rate (95%IE)		
	2010-11	2011-12	2012-13
<5	-4 (-16, 12)	7 (-9, 31)	-2 (-19, 27)
5-17	-11 (-31, 25)	32 (-2, 110)	-2 (-32, 80)
18-49	3 (-6, 15)	-10 (-20, 4)	13 (-2, 34)
50-64	8 (0, 18)	0 (-9, 12)	26 (13, 44)
≥65	1 (-6, 10)	-7 (-15, 3)	7 (-4, 20)

Possible early evidence of serotype replacement among adults 50-64 years old.

Percent Change in All IPD, Comparing Observed Cases to Cases Expected in Absence of PCV13, by age

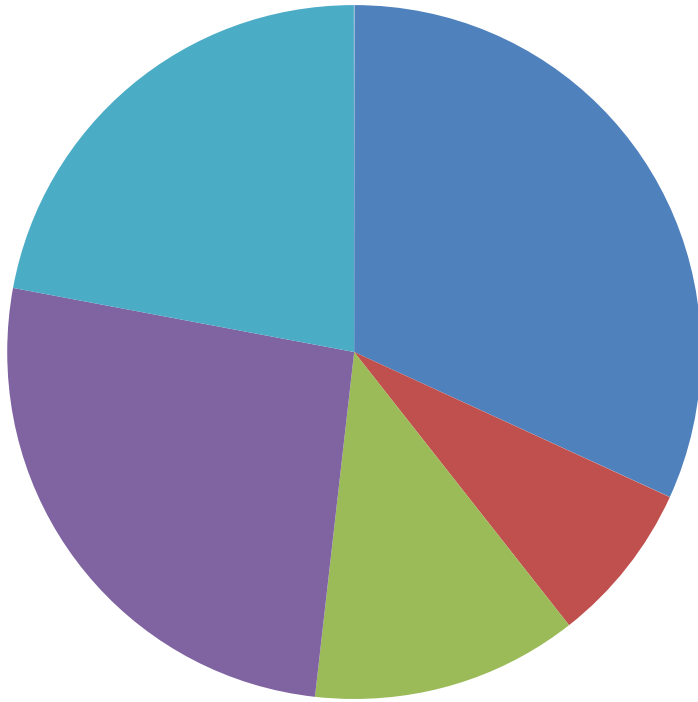
Age group, years	Percent Change in Rate (95%IE)		
	2010-11	2011-12	2012-13
<5	-45 (-40, -50)	-58 (-53, -63)	-64 (-59, -68)
5-17	-33 (-18, -45)	-36 (-16, -49)	-53 (-35, -64)
18-49	-12 (-5, -20)	-37 (-30, -43)	-32 (-22, -40)
50-64	-8 (-2, -14)	-28 (-22, -33)	-18 (-10, -26)
≥65	-6 (-14, 3)	-19 (-9, -27)	-12 (-22, 1)

Significant reductions in overall IPD in all age groups through first 3 years of PCV13 use among children.

National Cases & Deaths of IPD Prevented following PCV13 Introduction, July 2010 - June 2013

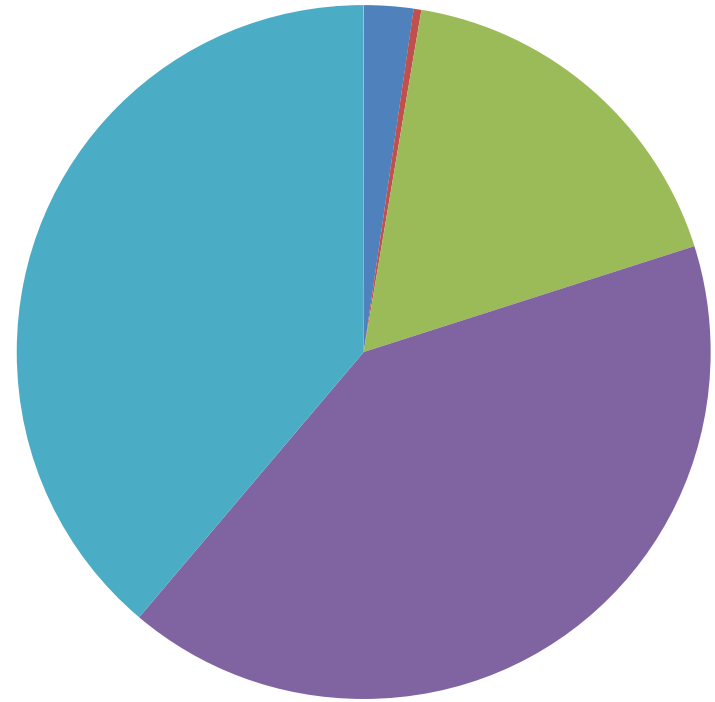
~ 30,000 cases prevented

■ <5 ■ 5 to 17 ■ 18 to 49 ■ 50 to 64 ■ >64



~ 3,000 deaths prevented

■ <5 ■ 5 to 17 ■ 18 to 49 ■ 50 to 64 ■ >64



Case-Control Study of PCV13 Effectiveness: Preliminary Estimates

- Cases: 2-59 month-old children with IPD residing in 10 ABCs areas, New York City, Los Angeles County, Utah
- May 2010 - September 2013
 - Enrolled 760 cases
 - 224 (29%) had PCV13-type IPD
 - 209 (93%) were caused by serotypes 19A, 7F, and 3
 - Enrolled 3,519 controls (mean 3 controls per case)
 - Receipt of ≥ 1 dose among controls increased from 38% in June-November 2010 to 96% in May-September 2013

Outcome	VE ≥ 1 dose, %	95% CI
All IPD	59	45-70
PCV13-type IPD	89	79-94
Serotype 19A	90	76-96
Serotype 7F	100	.-100
Serotype 3	76	13-93

Conclusions

- Reductions in IPD caused by additional serotypes in PCV13 among all age groups, indicative of direct and indirect effects
- Early evidence of increases in non-PCV13 serotypes, possibly suggestive of serotype replacement
- Preliminary evidence of serotype-specific effectiveness for 3 most common PCV13 serotypes; additional analysis pending

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