



Impact of the Pneumococcal Conjugate Vaccines (PCV) on the burden of invasive pneumococcal disease (IPD) in Ireland

Data source: Irish Pneumococcal Reference Laboratory
(Data based on invasive *Streptococcus pneumoniae* isolates submitted for serotyping)

Date updated: 15th August 2017

Background

- IPD is a notifiable disease since January 2004
 - Clinicians and laboratories are legally obliged to notify all cases to the relevant Department of Public Health
- IPD Typing Project commenced in April 2007 and has been instrumental in:
 - Determining the serotype distribution of IPD isolates prior to the introduction of PCV7 to the infant immunisation schedule
 - Monitoring the impact of the vaccine on the burden of IPD and on the serotype distribution of isolates
- PCV7 vaccine was introduced in September 2008
 - To the routine infant immunisation schedule at 2, 6 and 12 months
 - Catch-up for children < 2 years of age (born 02/09/2006-30/06/2008)
- PCV13 was introduced in December 2010
 - To the routine infant immunisation schedule at 2, 6 and 12 months for children born in or after October 2010
 - In December 2016 due to introduction of Men B vaccine, the third dose of PCV was shifted from 12 to 13 months of age for children born after October 1st

Serotypes covered by the Pneumococcal Conjugate Vaccines (PCV) used in Ireland since 2008

	1	3	4	5	6A	6B	7F	9V	14	18C	19A	19F	23F
PCV7													
PCV13													

PCV7 and PCV13 serotypes are highlighted in red and blue, respectively

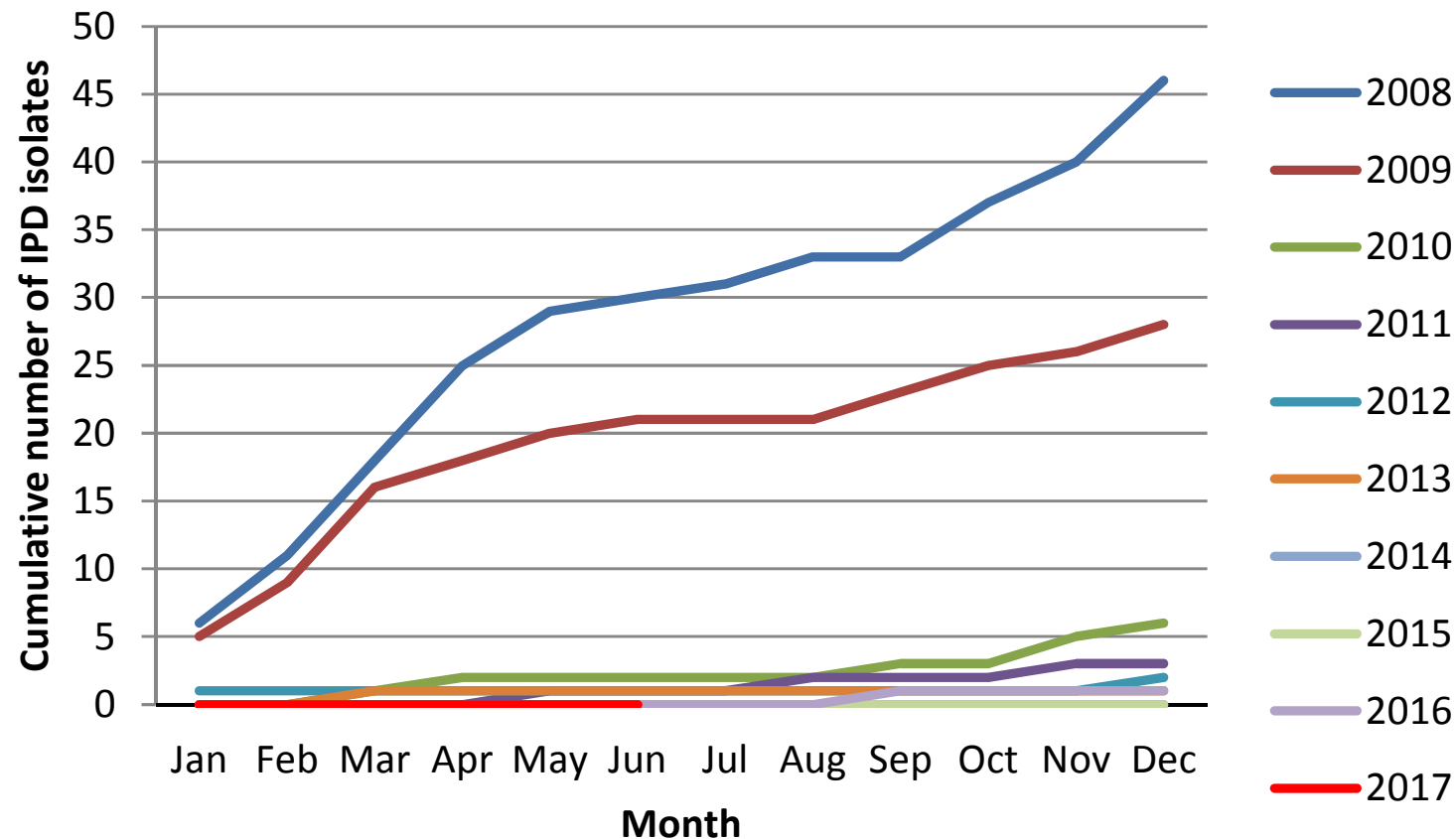
Where the term “PCV13-7” is presented in later slides, this relates to the six additional 6 serotypes covered by PCV13 i.e. serotypes 1, 3, 5, 6A, 7F and 19A

Summary of Results

Comparing data from Jan-June 2017 with same period in 2008, the main findings based on laboratory data from the Irish Pneumococcal Reference Laboratory are:

- IPD in Ireland declined by 3% overall
- The most dramatic decline was in children <5 years of age
 - 100% decline due to PCV7 serotypes
 - 91% decline due to PCV13-7 serotypes
 - 68% decline due to all serotypes
- Overall impact in IPD in 5 year olds:
 - 88% decrease due to PCV7 serotypes
 - 13% decrease due to PCV13-7 serotypes
 - 131% increase due to non-PCV13 serotypes
- Predominant serotypes in Jan – Jun 2017 were:
 - 8, 12F, 19A

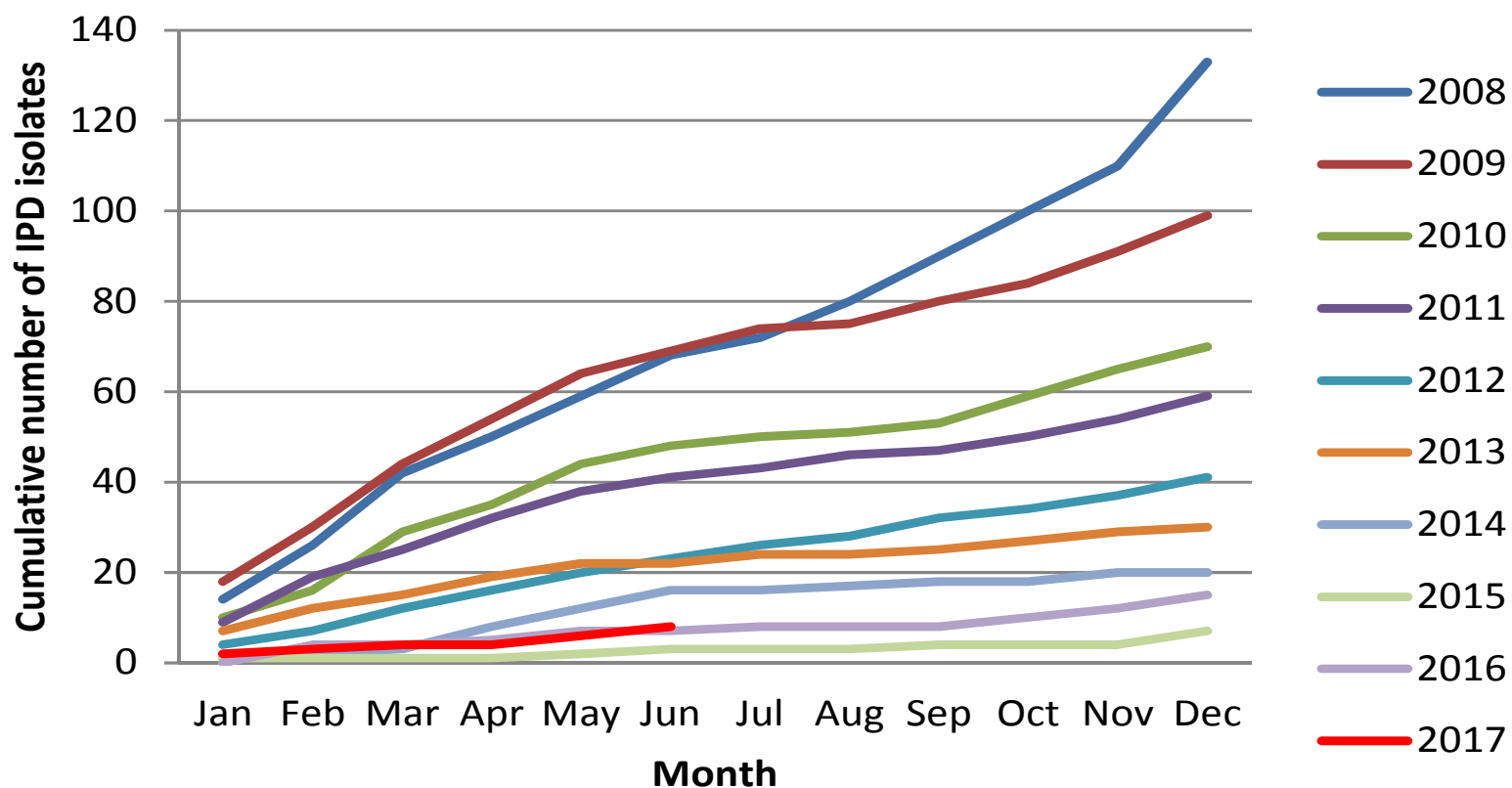
Impact of PCV on the burden of IPD caused by PCV7 vaccine serotypes in <5 year olds



100% reduction in IPD cases, comparing Jan-Jun 2017 with the same period in 2008

Data source: Irish Pneumococcal Reference Laboratory

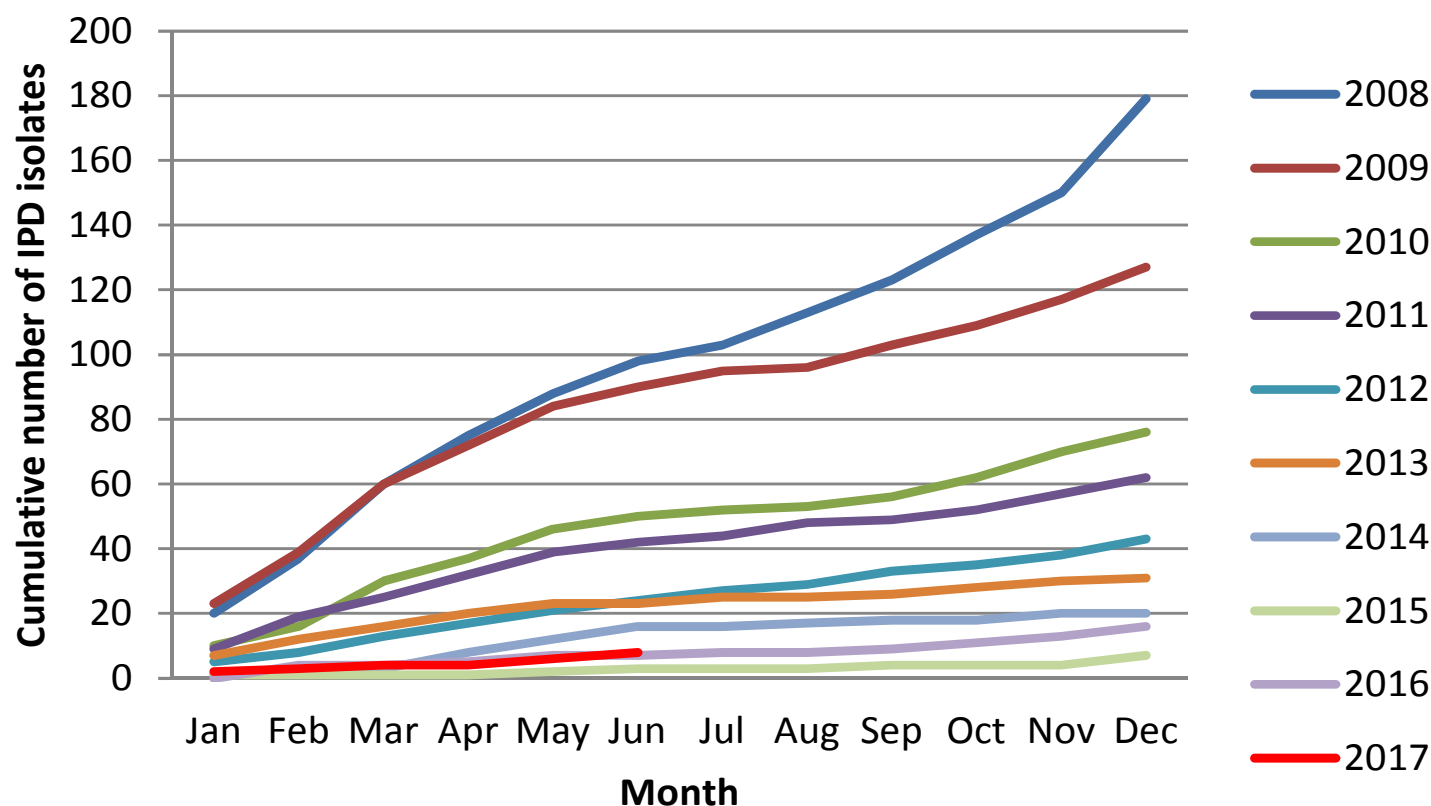
Impact of PCV on the burden of IPD caused by PCV7 vaccine serotypes in 5 year olds



88% reduction in IPD cases, comparing Jan-Jun 2017 with the same period in 2008

Data source: Irish Pneumococcal Reference Laboratory

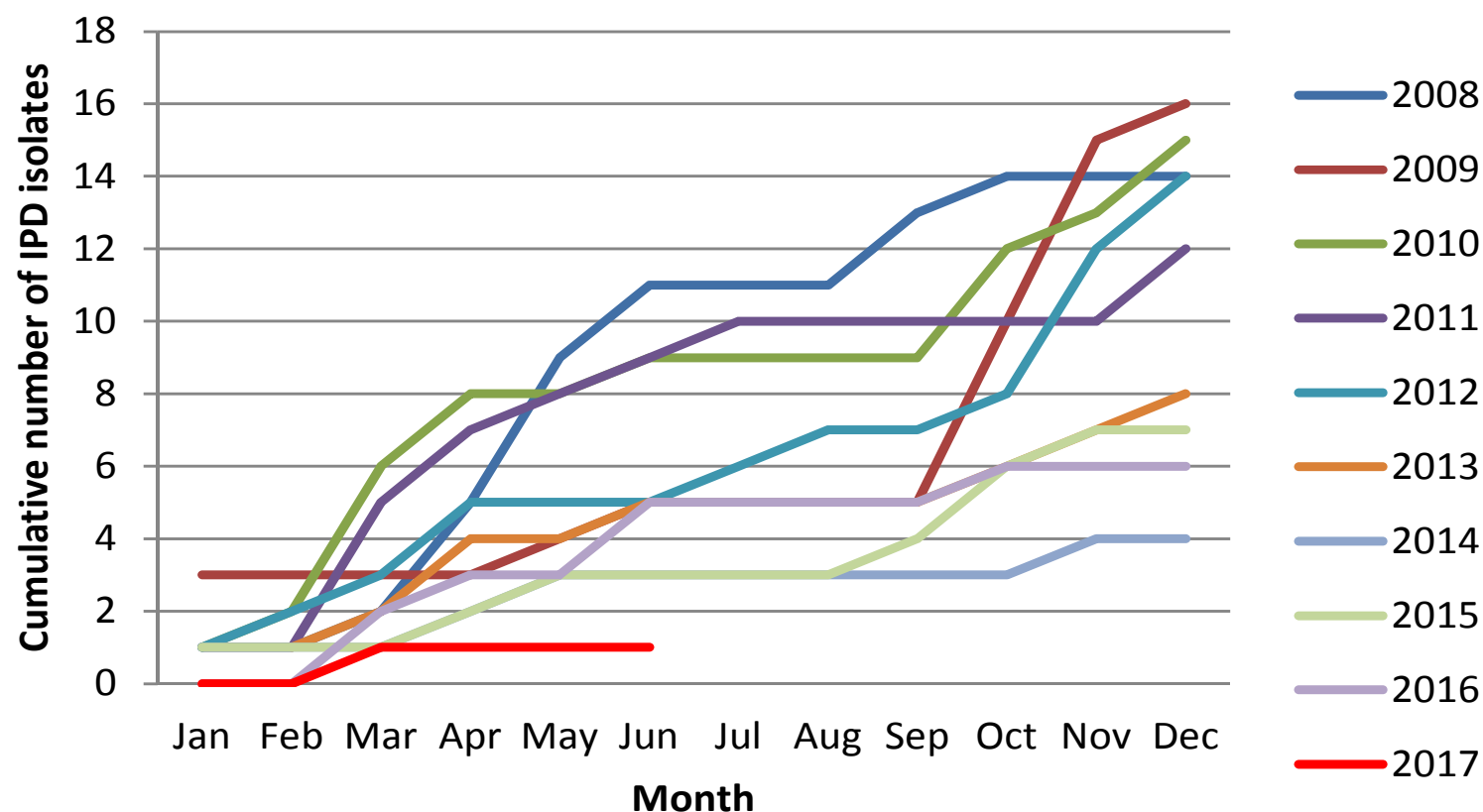
Impact of PCV on the burden of IPD caused by PCV7 vaccine serotypes in all age groups



92% reduction in IPD cases, comparing Jan-Jun 2017 with the same period in 2008

Data source: Irish Pneumococcal Reference Laboratory

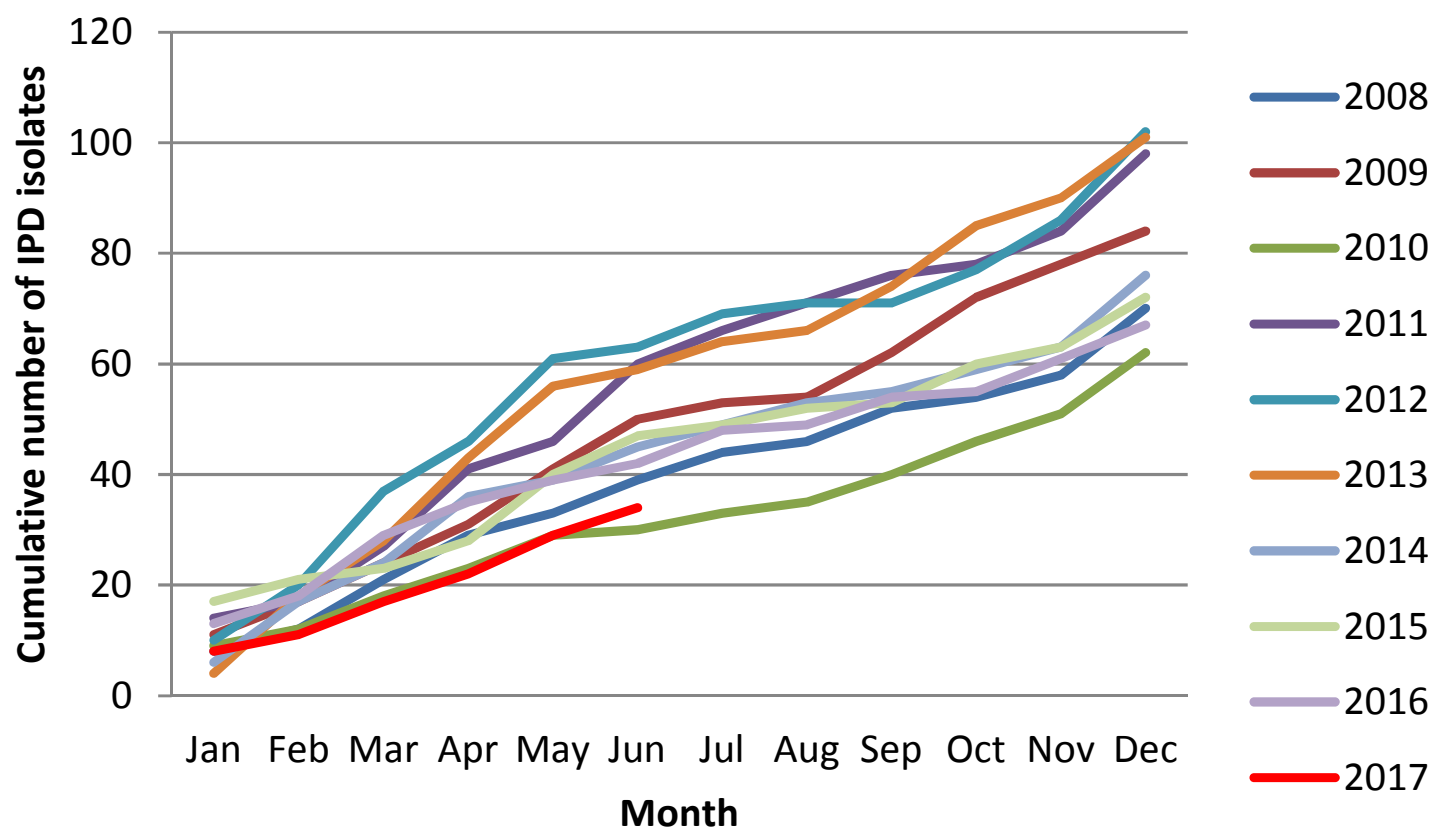
Impact of PCV on the burden of IPD caused by PCV13-7 vaccine serotypes in <5 year olds



91% reduction in IPD cases, comparing Jan-Jun 2017 with the same period in 2008

Data source: Irish Pneumococcal Reference Laboratory

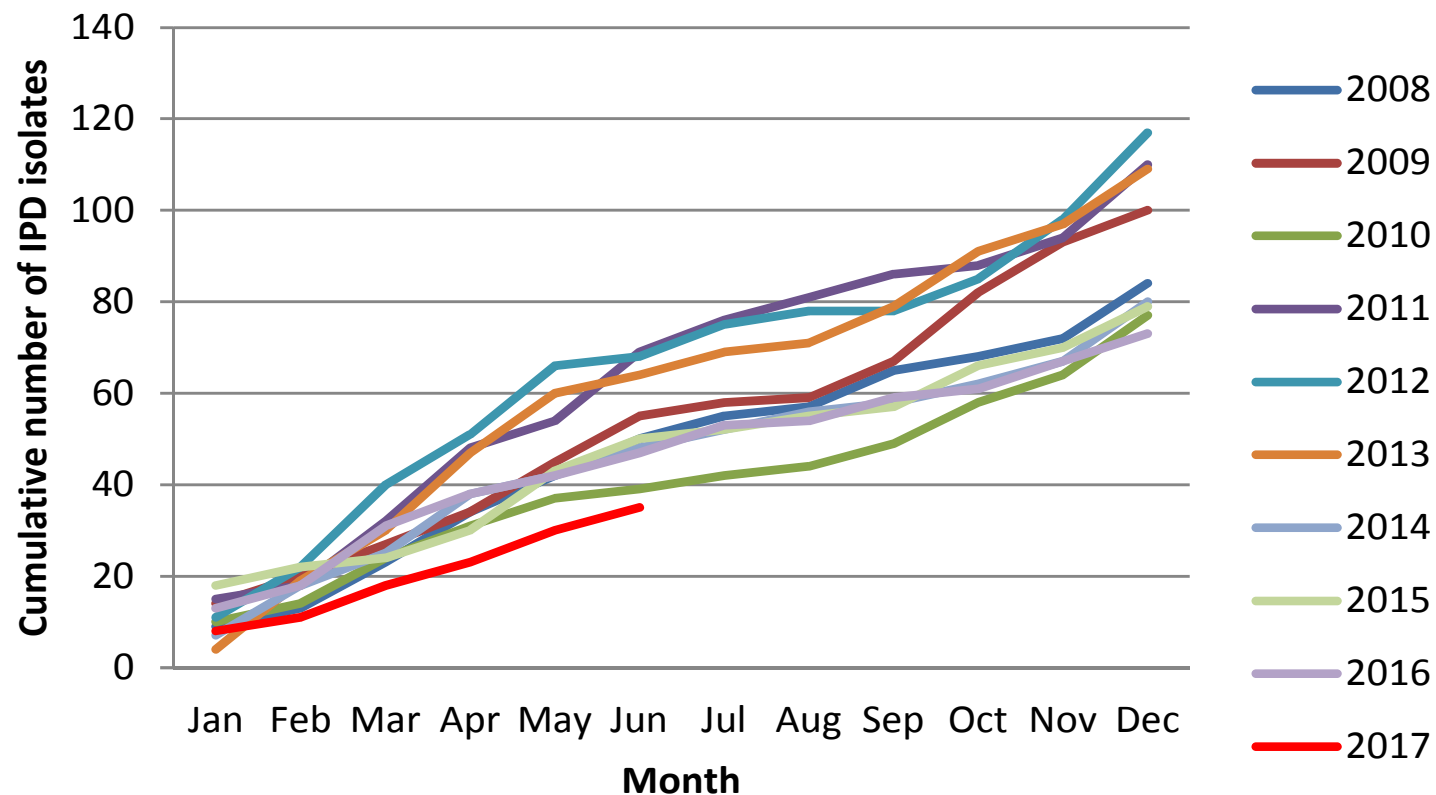
Impact of PCV on the burden of IPD caused by PCV13-7 vaccine serotypes in 5 year olds



13% reduction in IPD cases, comparing Jan-Jun 2017 with the same period in 2008

Data source: Irish Pneumococcal Reference Laboratory

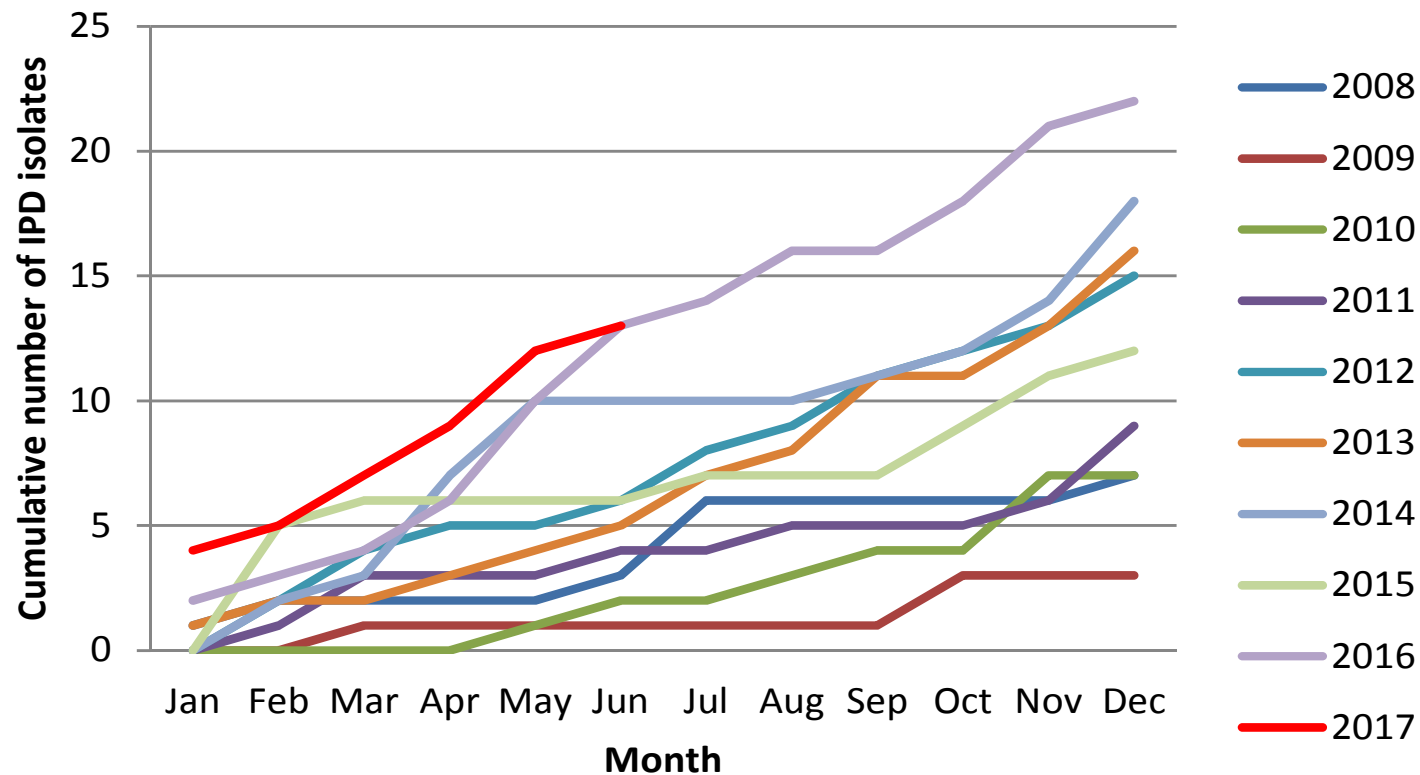
Impact of PCV on the burden of IPD caused by PCV13-7 vaccine serotypes in all age groups



30% reduction in IPD cases, comparing Jan-Jun 2017 with the same period in 2008

Data source: Irish Pneumococcal Reference Laboratory

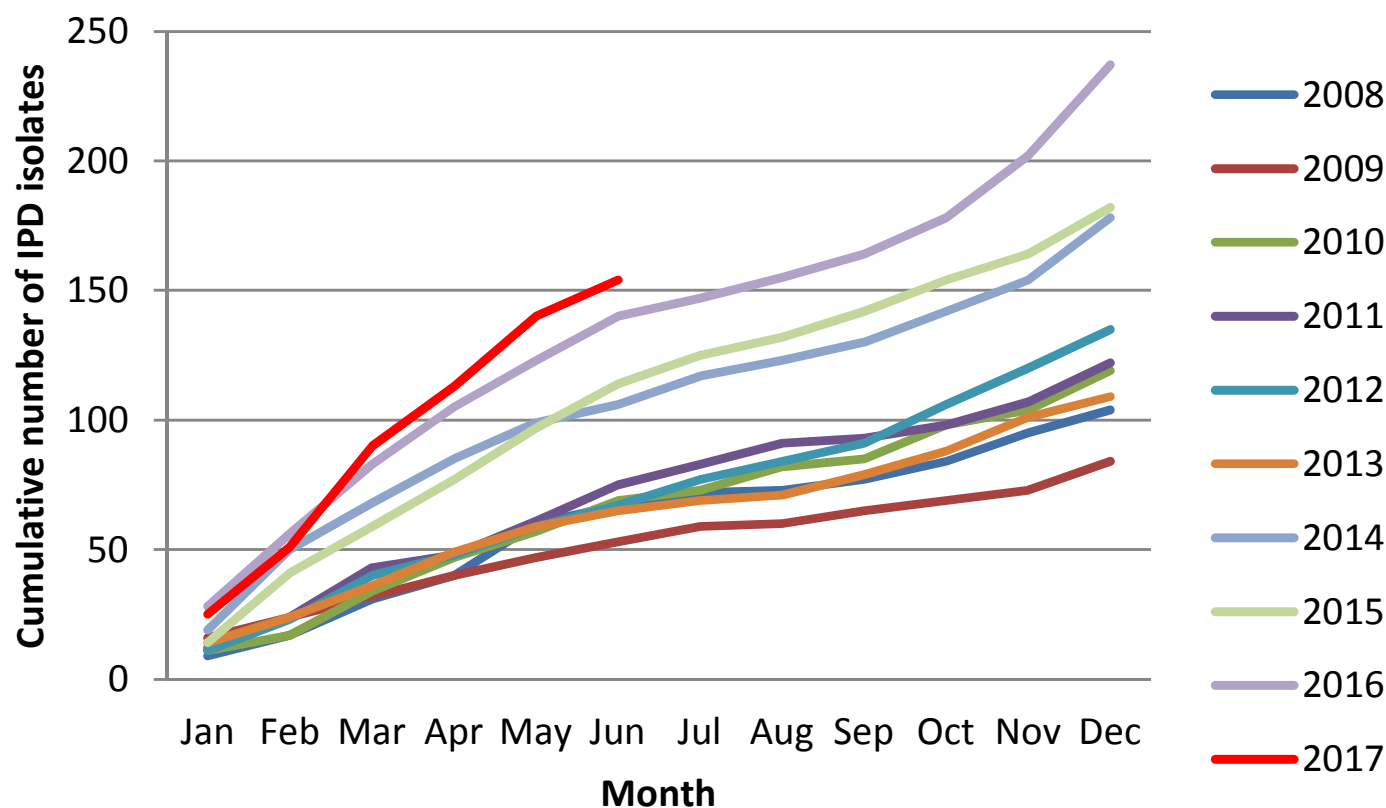
Impact of PCV on the burden of IPD caused by non-PCV13 vaccine serotypes in <5 year olds



333% increase in IPD cases, comparing Jan-Jun 2017 with the same period in 2008

Data source: Irish Pneumococcal Reference Laboratory

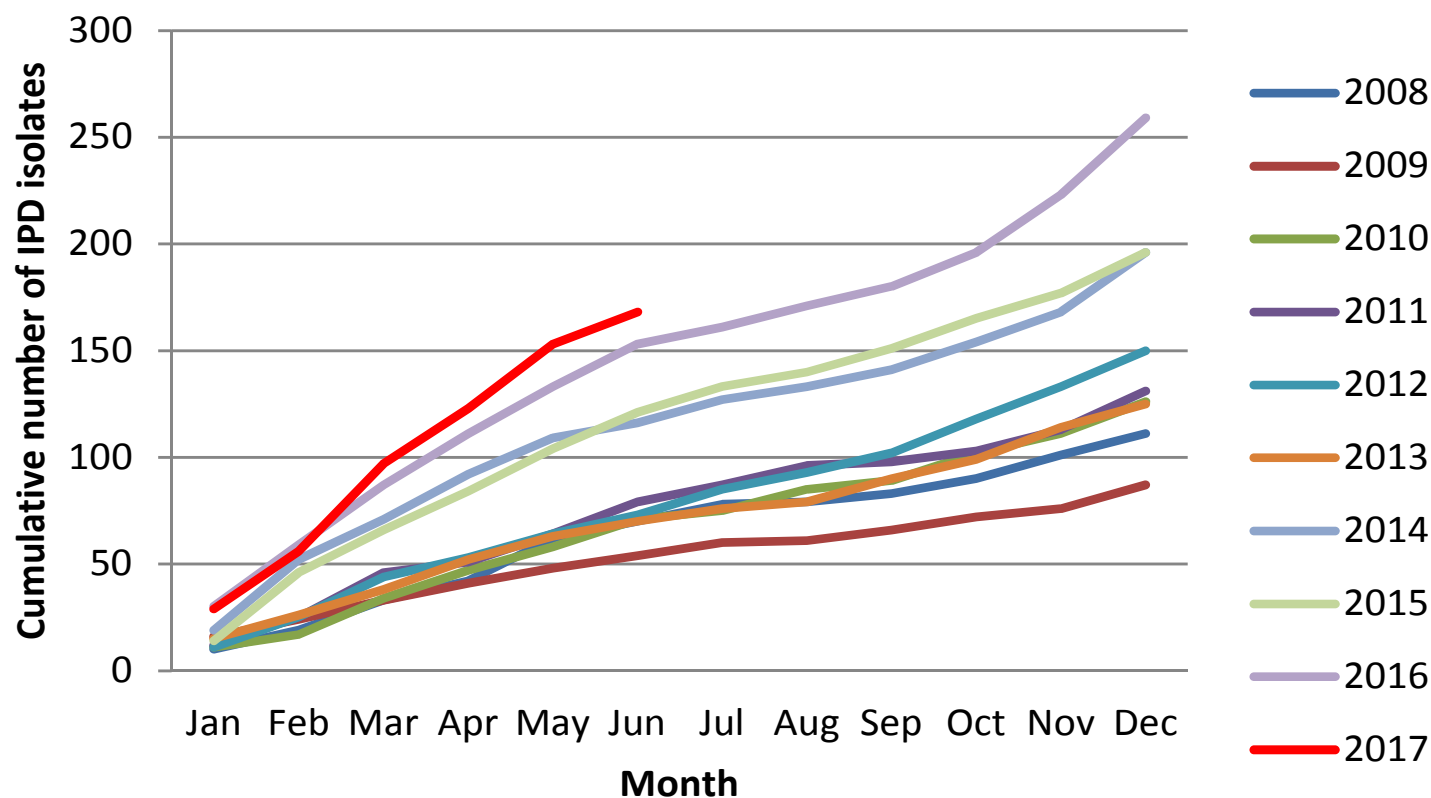
Impact of PCV on the burden of IPD caused by non-PCV13 vaccine serotypes in 5 year olds



131% increase in IPD cases, comparing Jan-Jun 2017 with the same period in 2008

Data source: Irish Pneumococcal Reference Laboratory

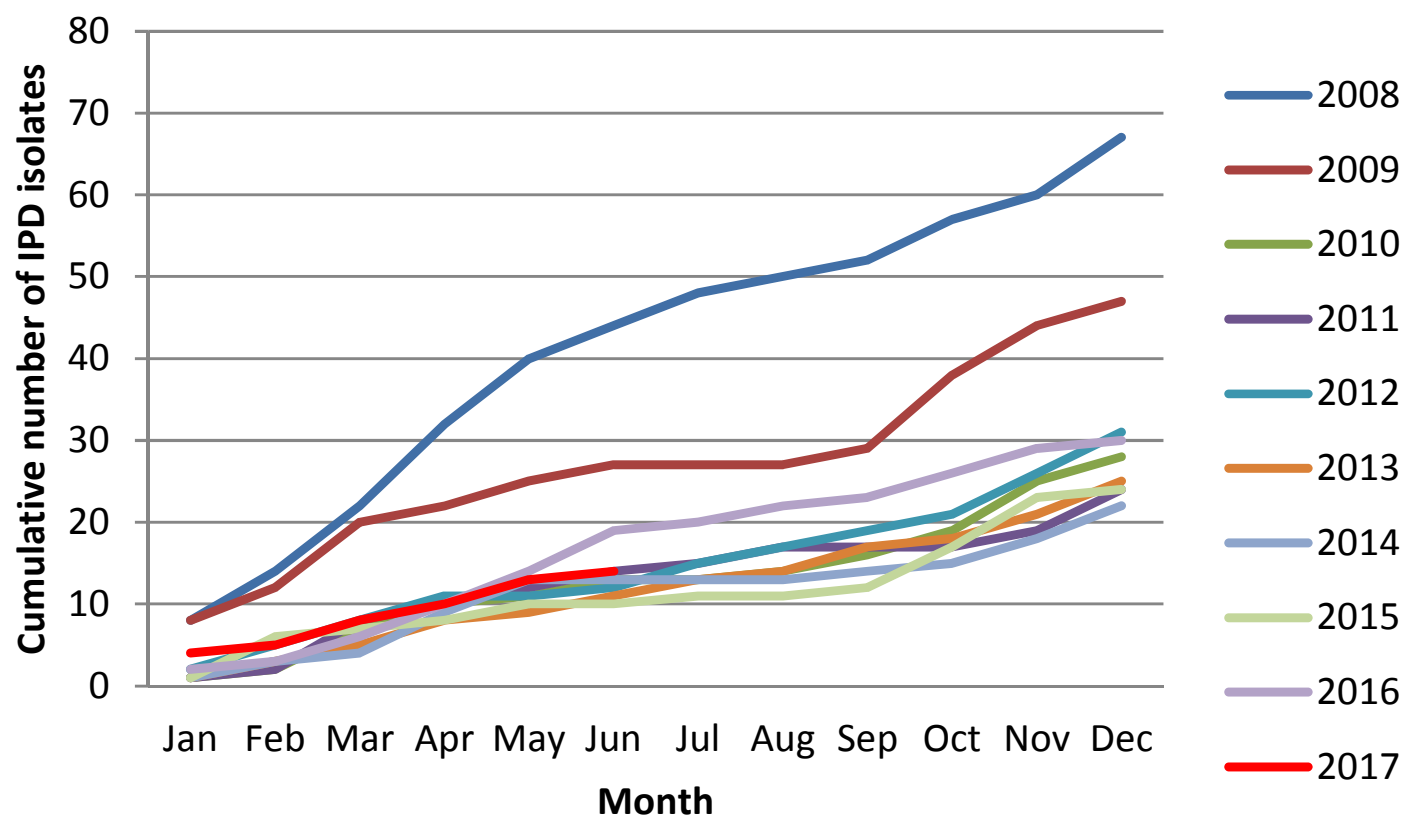
Impact of PCV on the burden of IPD caused by non-PCV13 vaccine serotypes in all age groups



140% increase in IPD cases, comparing Jan-Jun 2017 with the same period in 2008

Data source: Irish Pneumococcal Reference Laboratory

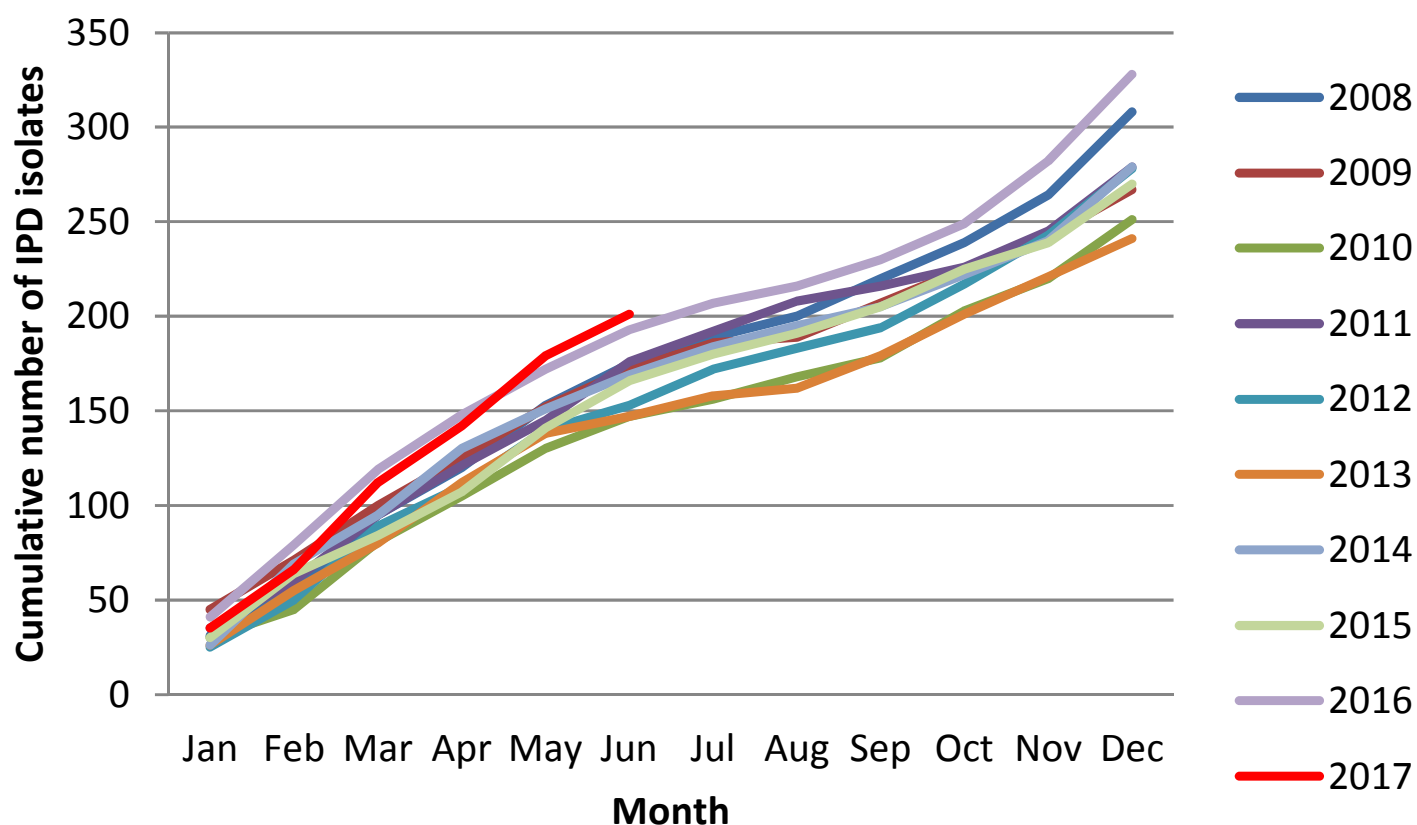
Impact of PCV on the burden of IPD caused by all serotypes in <5 year olds



68% reduction in IPD cases, comparing Jan-Jun 2017 with the same period in 2008

Data source: Irish Pneumococcal Reference Laboratory

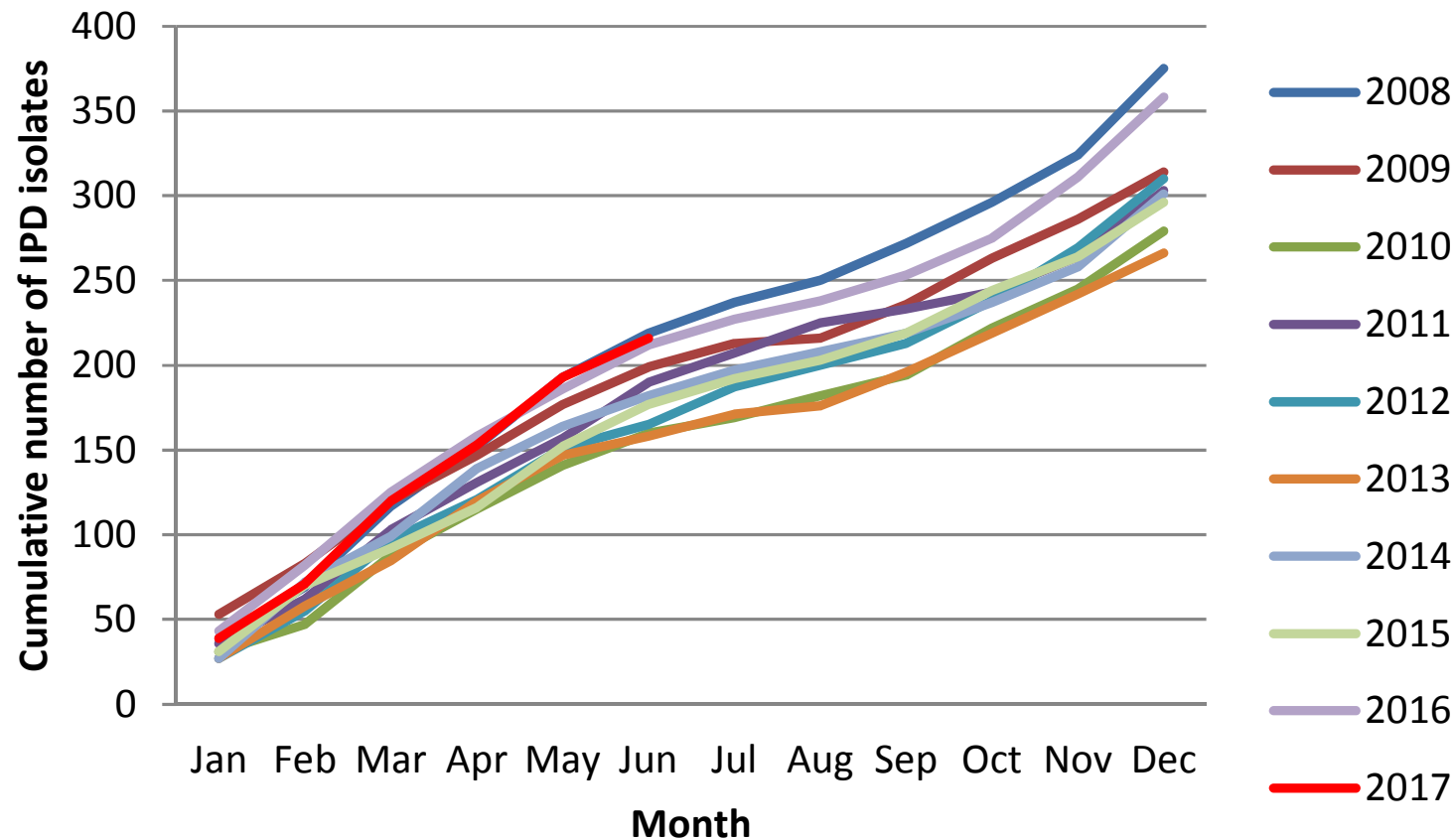
Impact of PCV on the burden of IPD caused by all serotypes in 5 year olds



13% increase in IPD cases, comparing Jan-Jun 2017 with the same period in 2008

Data source: Irish Pneumococcal Reference Laboratory

Impact of PCV on the burden of IPD caused by all serotypes in all age groups



3% reduction in IPD cases, comparing Jan-Jun 2017 with the same period in 2008

Data source: Irish Pneumococcal Reference Laboratory

Cumulative number of IPD isolates between January – December 2008 and 2016 and percentage changed in burden of IPD since introducing PCV in Ireland

	PCV 7 serotypes			PCV 13-7 serotypes			Non PCV 13 serotypes			All serotypes		
	<5yrs	≥5yrs	All ages	<5yrs	≥5yrs	All ages	<5yrs	≥5yrs	All ages	<5yrs	≥5yrs	All ages
2008 Jan-Jun	30	68	98	11	39	50	3	67	70	44	174	218
2017 Jan-Jun	0	8	8	1	34	35	13	155	168	14	197	211
% change	-100	-88	-92	-91	-13	-30	+333	+131	+140	-68	+13	-3

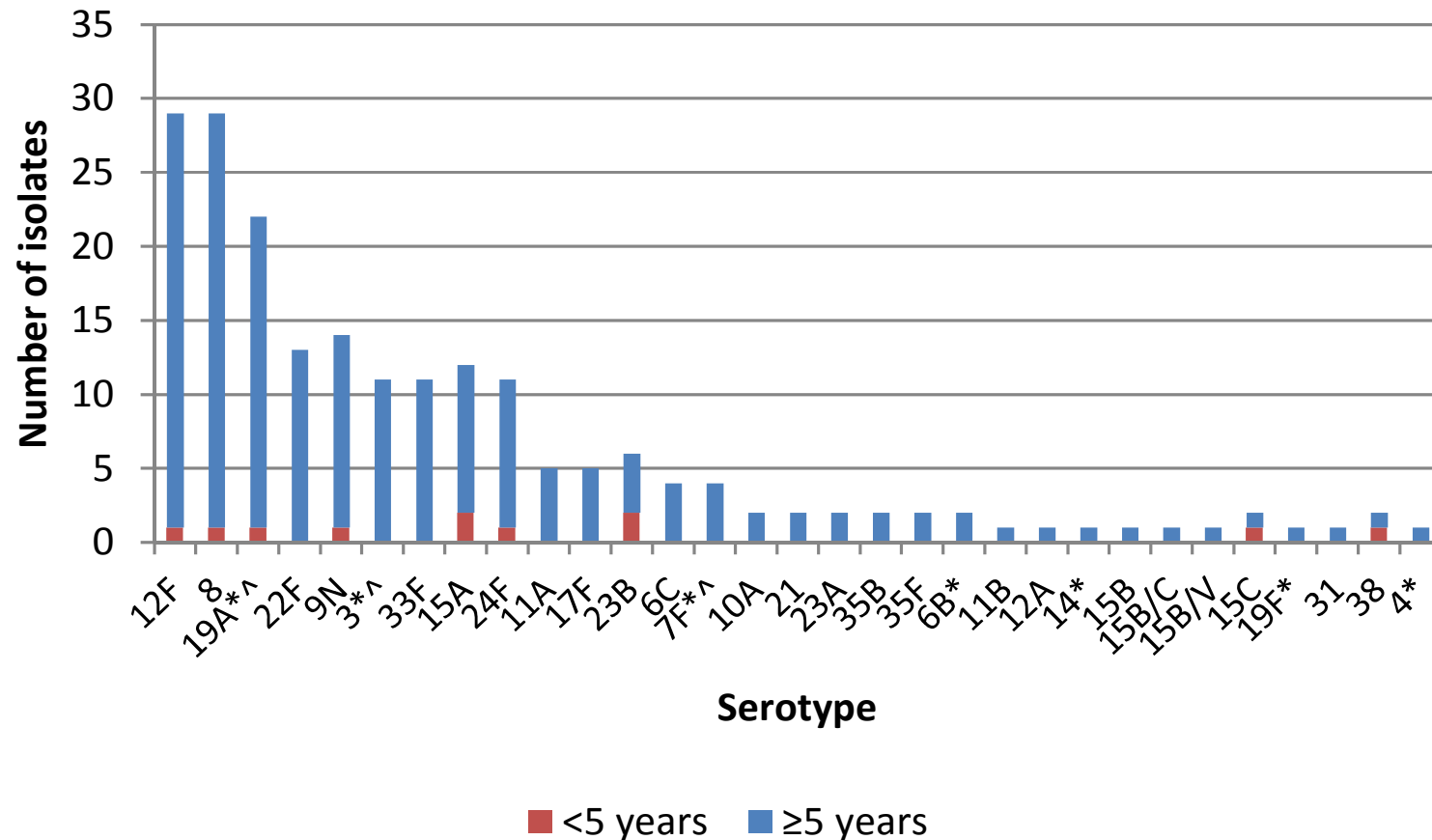
Data Source: National Typing Project

PCV7 serotypes: 4, 6B, 9V, 14, 18C, 19F and 23F;

PCV13-7 serotypes: 1, 3, 5, 6A, 7F, 19A

Non-PCV13 serotypes: All serotypes excluding the 13 serotypes (listed above) in PCV13

Distribution of the *S. pneumoniae* serotypes in Ireland by age group in Jan - Jun 2017



* Denotes serotypes included in PCV7

*^ Denotes additional serotypes included in PCV13

Data source: Irish Pneumococcal Reference Laboratory

Activities key to the surveillance of IPD in Ireland

- **Notifications:** Clinicians and laboratories should notify all cases of IPD to the relevant Department of Public Health and data are inputted to the national Computerised Infectious Diseases reporting (CIDR) system for notifiable infectious diseases.
- **Typing:** Laboratories should submit **all** invasive *S. pneumoniae* isolates to CUH for typing by address: Irish Pneumococcal Reference Laboratory which is housed with
Irish Meningitis & Sepsis Reference Laboratory,
Temple Street Children's University Hospital,
Temple Street, Dublin 1
- **Enhanced surveillance:** Departments of Public Health perform enhanced surveillance on cases of IPD notifications and enter these data on CIDR.
- **Antimicrobial resistance:** Laboratories should report data on antimicrobial resistance profiles of invasive *S. pneumoniae* isolates (from blood and CSF) to the European Antimicrobial Resistance Surveillance System Network(EARS-Net) at HPSC.

Laboratories: Submission of isolates for typing

For details regarding the submission of invasive *Streptococcus pneumoniae* isolates for typing, please contact:

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Address:

Irish Pneumococcal Reference Laboratory,
Irish Meningitis & Sepsis Reference Laboratory,
Temple Street Children's University Hospital,
Temple Street, Dublin 1

Departments of Public Health: IPD surveillance

- **IPD enhanced surveillance form** is available at:
<http://www.hpsc.ie/hpsc/A-Z/VaccinePreventable/PneumococcalDisease/SurveillanceForms/>
- **Protocol** for the enhanced surveillance of IPD is available at:
<http://www.hpsc.ie/hpsc/A-Z/VaccinePreventable/PneumococcalDisease/InformationforHealthProfessionals/>

Further Reading

For further details on the surveillance and epidemiology of IPD in Ireland, please see:

- Biannual Reports on invasive ***Streptococcus pneumoniae*** infection; available at <http://www.hpsc.ie/A-Z/VaccinePreventable/PneumococcalDisease/Publications/QuarterlyReportsonInvasivePneumococcalDisease/>
- Annual Reports on invasive ***Streptococcus pneumoniae*** infection; available at <https://www.hpsc.ie/a-z/vaccinepreventable/pneumococcaldisease/publications/annualreportsoninvasivepneumococcaldisease/>
- Articles published in Epi-Insight; available at <http://www.hpsc.ie/hpsc/A-Z/VaccinePreventable/PneumococcalDisease/Publications/Articles/>
- Posters and Presentations, available at <http://www.hpsc.ie/hpsc/A-Z/VaccinePreventable/PneumococcalDisease/PostersPresentations/>
- Quarterly and Annual EARSS Reports; available at <http://www.hpsc.ie/hpsc/A-Z/MicrobiologyAntimicrobialResistance/EuropeanAntimicrobialResistanceSurveillanceSystemEARSS/EARSSSurveillanceReports/>

IPD National Typing Project Team

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