broader serotype coverage. The aim of this study was to estimate the population-level impact of new PCVs to replace the existing 13-valent vaccine (PCV13) in infants.

Methods. An age-structured dynamic transmission model of *Streptococcus pneumoniae* before and after PCVs introduction was developed. The model was fit to longitudinal Active Bacterial Core surveillance (ABCs) data (1997–2015) in the United States on distribution and cases of IPD, as well as population level prevalence and serotype distribution data. It was assumed that total *S. pneumoniae* carriage remains constant over time, with full carriage replacement within four years of introduction of any PCV. Two alternative new PCVs with differing IPD coverage are tested with an introduction date of 2024.

Results. When compared with continuing vaccination of infants with PCV13, 10 years after a new PCV is introduced (2,034) cases of IPD are substantially reduced (shown in the table below). Broader serotype coverage leads to greater reductions in IPD. The greatest IPD reduction occurs in the directly vaccinated infant groups, however similar reductions are also observed in the unvaccinated elderly population due to herd protection.

Additional Vaccine Coverage Over PCV13 (2016/2024)[a]	IPD Incidence Rate Reduction [%] (2,024 vs. 2,034)				
	<2 Years	2–5 Years	50–64 Years	≥65 Years	All Ages
11–21%/32–35%	36	35	33	31	31
15–30%/42–45%	42	42	41	39	40

[a]Defined as the proportion of IPD cases that are caused by serotypes covered by the new PCV in 2016/2024 (a range of values is given because of differences by age group; values differ between 2016 and 2024 as serotype prevalence has not reached steady state as of 2016).

Conclusion. A new, higher valent PCV given to infants in the United States has the potential to reduce future cases of IPD. Vaccination of infants may also have a substantial indirect benefit on IPD cases in adults and the elderly.

Disclosures. **M. Madin-Warburton**, Sanofi Pasteur: Consultant, IQVIA received consultancy fee. **A. B. Pitcher**, Sanofi Pasteur: Consultant, IQVIA received consultancy fee. **M. H. Kyaw**, Sanofi Pasteur: Employee, Salary. **A. Kieffer**, Sanofi Pasteur: Employee, Salary.

1428. Modeling Reductions in Antibiotic Prescriptions due to Otitis Media in Canada as a Result of Pneumococcal Conjugate Vaccination

Marie-Claude Breton, MPharm[1]; Raymond Farkouh, PhD[2]; Jelena Vojicic, MD[1]; Michele Wilson, MSPH[3]; Cheryl McDade, BA[3] and Matt Wasserman, MSc[4]; [1]Pfizer Canada, Kirkland, QC, Canada, [2]Pfizer Inc, Collegeville, Pennsylvania, [3]RTI Health Solutions, Research Triangle Park, North Carolina, [4]Pfizer Inc., New York, New York

Session: 146. Pneumococcal Vaccines
Friday, October 5, 2018: 12:30 PM

Background. Vaccines are an important factor in combating the growing global health issue of antimicrobial resistance. Pneumococcal conjugate vaccines (PCVs) have substantially reduced the burden of otitis media (OM) caused by *S. pneumoniae*, one of the largest causes of antibiotic prescriptions (Abx) in children under 5. The purpose of this study was to quantify the number of Abx avoided since the introduction of a national PCV program in Canada.

Methods. We adapted a previously published forecasting model to estimate the reduction in OM cases in Canada since the introduction of PCVs in all routine provincial programs in 2005 through 2015 (the last year complete data were available). The impact of PCV on OM was modeled and compared with pre-PCV incidence to estimate net impact of the vaccine. We assumed that 90% of OM episodes were treated with an initial Abx given routine practice. All data were sourced from the published literature.

Results. Over 10 years, PCVs were estimated to avert 3.7 million cases of OM in Canada. This corresponded to an estimated reduction of 3.3 million Abx, or 0.96 Abx avoided per infant vaccinated with PCV.

Conclusion. PCVs have had a significant public health impact on reducing the burden of disease and Abx. While most of the PCV impact on reduction of Abx is due to reduction in OM cases, additional Abx reduction from prevention of other invasive and noninvasive pneumococcal diseases is of importance. Further research is necessary to understand the additional net benefit of reducing antibiotics across the disease spectrum given that reductions in net prescribing could avert further downstream resistance by other pathogens.

Disclosures. **M. C. Breton**, Pfizer inc.: Employee, Salary. **R. Farkouh**, Pfizer: Employee, Salary. **J. Vojicic**, Pfizer: Employee and Shareholder, Benefits and stock and Salary. **M. Wilson**, Pfizer Inc: Consultant, Consulting fee. **C. McDade**, Pfizer Inc.: Consultant, Consulting fee. **M. Wasserman**, Pfizer: Employee, Salary.

1429. Emergence of Multidrug-resistant Serotype 24 Among Children Under 2 Years Old With Invasive Pneumococcal Disease After the Introduction of PCV13 in Argentina

Paula Gagetti, MD[1]; Alejandra Menocal, MD[1]; Diego Faccone, PhD[1]; Sofia Fossati, MD[2]; Daniela Napoli, MD[2]; Mabel Regueira, MD[2]; Argentina Spn Working Group[3] and Alejandra Corso, MD[1]; [1]Servicio Antimicrobianos, Instituto Nacional de Enfermedades Infecciosas ANLIS "Dr. Carlos G Malbran," Buenos Aires, Argentina, [2]Servicio Bacteriologia Clinica, Instituto Nacional de Enfermedades Infecciosas ANLIS "Dr. Carlos G Malbran," Buenos Aires, Argentina, [3]Argentina, Buenos Aires, Argentina

Session: 146. Pneumococcal Vaccines
Friday, October 5, 2018: 12:30 PM

Background. In Argentina PCV13 was included in the National Vaccination Program in January 2012 for children <2 years old Since 1993 *S. pneumoniae* Surveillance Program (SIREVA II-OPS/WHO) was conducted in the National Reference Laboratory (NRL). Serotype 24 rarely found before 2012, emerged after the introduction of PCV13. We aimed to analyze the trend in serotype 24 distribution and its associated resistance in children <2 years old between 2010 and 2016.

Methods. A total of 1,821 Spn isolates (<6 years old) from sterile fluids were received at NRL between January 2010 and December 2016 from 150 hospitals, 24 provinces and Buenos Aires city; 1029 (56.5%) <2 years old. Isolates were serotyped by Quellung, MICs were performed by agar dilution (CLSI) and resistance genes by PCR. Diagnosis: pneumonia (42%), meningitis (28%), sepsis (16%), other (14%). Eighty of 1,029 (7.8%) Spn were serotype 24. Three periods were defined: pre-PCV13 (2010–2011), transitional (2012) and post-PCV13 (2013–2016).

Results. Among 1,029 Spn isolated in <2 years old, PCV13 serotypes decreased from 86.4% (pre-PCV13) to 33.7% (post-PCV13) related to serotypes: 14, 6A, 6B and 5 ($P < 0.05$). Non-PCV13 serotypes increased from 13.6% (pre-PCV13) to 66.3%% (post-PCV13), mainly due to serotypes 24, 12F and 23B ($P < 0.05$). Among 80 serotype 24 Spn, 44 (55%) were <1 years old. Serotype 24 increased from 2.1 to 16.2% (pre-/post-PCV13), and ranks first since 2013. Antimicrobial nonsusceptibility (NS) among serotype 24 in pre-/post-PCV13 periods was: penicillin (PEN) (MIC ≥0.12 μg/mL) 70/91.2%, cefotaxime (MIC ≥ 1 μg/mL) 0/1.5%, erythromycin (ERY) 70/89.7%, tetracycline (TET) 60/83.8% and trimethoprim-sulfamethoxazole (SXT) 60/89.7%. NS to meropenem, chloramphenicol, levofloxacin, rifampicin, ceftaroline, and vancomycin was no detected. 97.1% of ERY-NS isolates carried *ermB* and 2.9% *mefA* genes. All the TET-NS isolates carried the tet*M* gene. Multidrug resistance to PEN, ERY, TET, and SXT increased from 50% in pre-PCV13 to 82% in post-PCV13 period ($P < 0.05$).

Conclusion. Serotype 24 represents the main non-PCV13 serotype in <2 years old with IPD after the introduction of PCV13. We observed an increase in prevalence and multidrug resistance in post-PCV13 period. Our results suggest that this emerging serotype could represent a real threat among pneumococcal disease in the near future.

Disclosures. **All authors:** No reported disclosures.

1430. Evolving Impact of 13-Valent Pneumococcal Conjugate Vaccine on Invasive Pneumococcal Disease

Inci Yildirim, MD PhD MSc[1,2]; Brent A. Little, PhD[3]; Kimberly M. Shea, PhD, MPH[4]; Stephen I. Pelton, MD[4] and Members of the Department of Public Health Massachusetts (MDPH)[5]; [1]Rollins School of Public Health, Emory University, Atlanta, Georgia, [2]Pediatric Infectious Diseases, Emory University School of Medicine, Atlanta, Georgia, [3]Pediatric Infectious Diseases, Boston University, Boston, Massachusetts, [4]Boston University Schools of Medicine and Public Health, Boston, Massachusetts, [5]Massachusetts Department of Public Health, Massachusetts, Massachusetts

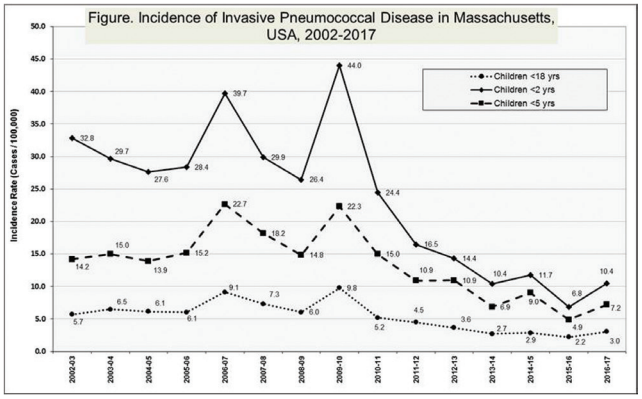
Session: 146. Pneumococcal Vaccines
Friday, October 5, 2018: 12:30 PM

Background. The 13-valent pneumococcal conjugate vaccine (PCV13) replaced PCV7 in the childhood immunization schedule in Massachusetts (MA) beginning in April, 2010. We describe the current epidemiology of invasive pneumococcal disease (IPD) in Massachusetts (MA) children after introduction of PCV13.

Methods. Cases of invasive pneumococcal disease (IPD) in children <18 years of age were detected through an enhanced surveillance system in MA since 2001. All cases in children and *Streptococcus pneumoniae* (SP) isolates, when available, are submitted to Department of Public Health (MDPH) and parents/physicians are interviewed for confirmation of demographic and clinical data. All available isolates are confirmed as SP, serotyped by Quellung reaction.

Results. There were 351 IPD cases in MA children from April 1, 2010 to September 31, 2017, and 36 (10.3%) were in infants <6 months; 42 (12.0%) in children between 6 and 12 months; 63 (18.0%) in toddlers 12–24 months; 102 (29.1%) in children aged 2–5 years, and 108 (30.8%) were in children aged ≥5 years. Incidence of IPD declined to $6.8/10^5$ children (95% CI 2.6–11.1) in 2015/2016 period which represents a 72.1% decline compared with 2010/2011 ($24.4/10^5$, 95% CI 16.3–32.5) (figure). However, in 2016/2017, IPD incidence increased to $10.4/10^5$ children (95% CI 5.2–15.7). The most common clinical presentation was bacteremia (62.9%), followed by pneumonia (30.5%) and CNS disease (6.6%). Among, 103 (32.6%) children with ≥1 comorbidity, asthma (13.2%), hematologic malignancy (12.1%), prematurity (9.9%) and sickle cell disease (9.9%) were the most common comorbidities. He overall mortality rate was 5.1%. Isolates from 308 (89.3%) were available for serotyping; vaccine serotypes (VST) were identified in 106 (33.3%) IPD cases [19A (46.2%), 7F (19.9%), 3 (17.9%), 19F (10.4%), 6A (2.8%), 14, 18C, 5 (0.9% each). Serotypes 15BC (13.7%), 22F (12.6%) and 33F (11.8%) were the most common nonvaccine serotypes (NVST).

Conclusion. Invasive pneumococcal disease identified in the post-PCV13-era is primarily caused by NVSTs, specifically serotypes 15BC, 33F and 22F; and disproportionately observed in children with comorbid conditions. Continued surveillance is necessary to determine the impact of PCV13, as well as track potential changes in disease incidence and character due to NVST.



Disclosures. **All authors:** No reported disclosures.

1431. Dynamics of Antibiotic Prescription Rate Following Pneumococcal Conjugate Vaccine (PCV) Implementation in Children <2 Years Old: Comparison Between High and Low Prescribing Clinics in Two Different Ethnic Groups

Dana Danino, MD[1,2]; Noga Givon-Lavi, PhD[1,2]; Shalom Ben-Shimol, MD[1,2]; David Greenberg, MD[1,2] and Ron Dagan, MD[2]; [1]Pediatric Infectious Disease Unit, Soroka University Medical Center, Beer-Sheva, Israel, [2]Faculty of Health Sciences, Ben-Gurion University of the Negev, Beer-Sheva, Israel

Session: 146. Pneumococcal Vaccines

Friday, October 5, 2018: 12:30 PM

Background. Antibiotic overuse is common among pediatricians. Since PCV reduces respiratory infections, a resultant reduction in antibiotic consumption was expected. We speculated that the decline in dispensed antibiotic prescription (DAP) rates will be greater among high antibiotic user clinics (HUC) than low user clinics (LUC).

Methods. Southern Israel is inhabited by two ethnic groups: Bedouins and Jews. Pre-PCV, DAP rates were higher in Bedouin children. In 2005–2009, yearly average of 10,002 Bedouin and 8,977 Jewish children <2 years were insured by Clalit Health Maintenance Organization, where all prescriptions are computerized. Active clinics during both pre- and post-PCV periods with ≥50 insured children <2 years were enrolled. Mixed Bedouin/Jewish clinics (14% of children) were excluded. DAP rates were calculated by age, antibiotic category and ethnicity. Clinics were classified as HUC (above median DAP rates) and LUC (below median rates). During 2009–2016, 137,663 and 59,606 prescriptions were dispensed in HUC and LUC resp. among the Jewish children and 214,524 and 91,236 resp., among Bedouin children. PCV7/PCV13 were implemented in July 2009/November 2010 and rapidly reached ≥90% coverage.

Results. Proportion of dispensed antibiotics pre-PCV implementation is shown in Figure 1. Mean (/1,000 child year ±SD) DAP rates during pre PCV implementation were 3,246 ± 156 and 2,136 ± 11 in Bedouin and Jewish children resp. The respective figures in HUC and LUC were 4,033 ± 163 and 2,172 ± 205 in Bedouin children; and 2,589 ± 33 and 1,417 ± 51 in Jewish children (P <0.001). Pre-PCV, no significant trends in DAP rates were observed, but the rates rapidly declined post PCV in HUC in both ethnic groups. The reduction was greater in HUC than LUC, and no decrease was seen in LUC for Jewish children (Figure 2). Similar trends were found with amoxicillin, the commonest dispensed antibiotic. No decline in azithromycin was seen in HUC, and a significant increase was found in LUC, in both ethnic groups.

Conclusion. PCV7/PCV13 implementation was associated with a significant decline of DAP rates except in LUC among Jewish children, resulting in partial closing of the gap between HUC and LUC. Similar trends were found in both ethnic groups despite significant differences in the pre-PCV DAP rates.

Figure 1: Proportions of dispensed antibiotic prescriptions by antibiotic category, before PCV implementation, July 2005 – June 2009

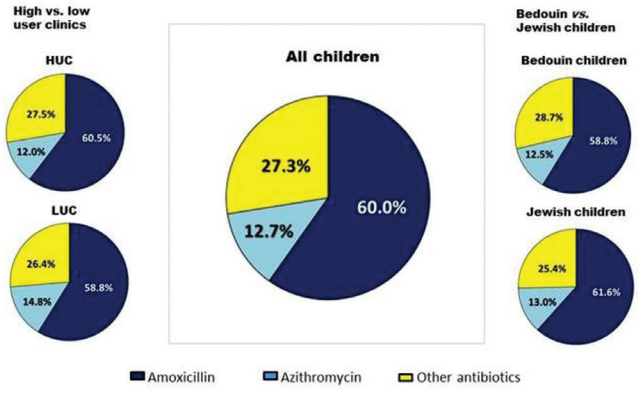
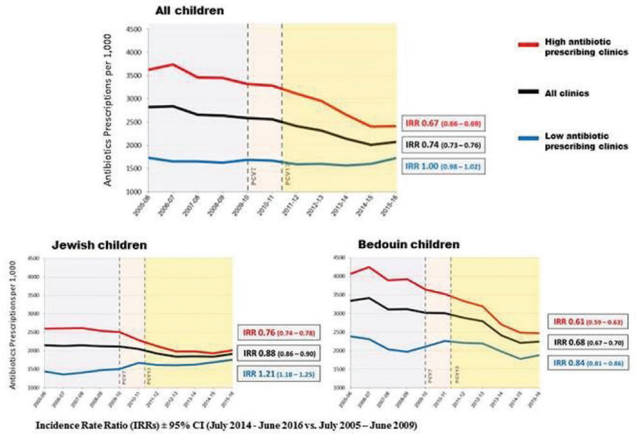


Figure 2: Overall antibiotics prescription rates in children <2 years, in all by high and low antibiotic prescribing clinics in southern Israel, July 2005 through June 2016.



Disclosures. **S. Ben-Shimol**, Pfizer: Grant Investigator and Speaker's Bureau, Research grant and Speaker honorarium. **D. Greenberg**, Pfizer: Consultant and Speaker's Bureau, Consulting fee and Speaker honorarium. **R. Dagan**, Pfizer: Consultant, Grant Investigator, Scientific Advisor and Speaker's Bureau, Consulting fee, Grant recipient, Research grant and Speaker honorarium. MeMed: Consultant, Consulting fee. MSD: Consultant, Grant Investigator and Scientific Advisor, Consulting fee and Research grant.

1432. County-Wide Pediatric IPD Experience Following Prevnar 13 Implementation

Delma Nieves, MD[1]; Stephanie Osborne, BS, RN[2]; Michele Cheung, MD MPH[3] and Antonio Arrieta, MD, FIDSA[1]; [1]Infectious Diseases, CHOC Children's Hospital, Orange, California, [2]Research Institute, CHOC Children's, Orange, California, [3]Epidemiology and Assessment, Orange County Health Care Agency, Santa Ana, California

Session: 146. Pneumococcal Vaccines

Friday, October 5, 2018: 12:30 PM

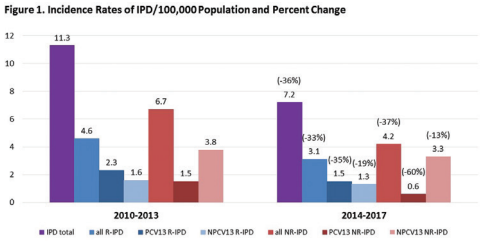
Background. Although invasive pneumococcal disease (IPD) has declined following pneumococcal conjugate vaccines, both respiratory (R-IPD; e.g., pneumonias +/− empyema) and nonrespiratory IPD (NR-IPD) remain concerning. We evaluate 13-valent pneumococcal conjugate vaccine (PCV13) impact on county-wide IPD, serotypes involved and patients affected since its 2010 introduction.

Methods. Prospective analysis of culture confirmed pediatric IPD was conducted in Orange County, CA following PCV13 vaccine implementation comparing 2010–2013 (transition; Era 1) to 2014–2017 (full implementation; Era 2). We reviewed age, ethnicity, health status, immunizations, immune work up, site of infection, and serotype distribution.

Results. There were 135 IPD cases (78[58%] male; 63[47%] Hispanic, 38[28%] White, 14[10%] Asian, 9[7%] other and 11[8%] unknown). IPD decreased by 37.3% (Era 1 = 83 cases vs. Era 2 = 52). R-IPD (41.5%) and NR-IPD (58.5%) exhibited a similar decrease. Serotype was known for 116 (86%) cases. Overall PCV13 serotype incidence rate (IR) per 100,000 population decreased by 44.7%; of note non-PCV13 decreased by 14.8%. The largest change was seen in PCV13 serotype NR-IPD (−60%) (Figure 1). As a percentage of PCV13 serotypes, 19A and 3 increased from 32 and 21% to 46% (+44%) and 27% (+29%), respectively. Meanwhile, 7F decreased from 36 to 7% (−81%). R-IPD due to PCV13 serotype in children <5 years old did not decrease during the study (Figure 2). By Era 2 PCV13 immunization was broadly implemented (Figure 3). Despite being fully immunized, 12 patients (5[42%] male; 7[58%] White, 4[33%] Asian, 1[8%] other) developed PCV13 serotype IPD. The majority (10/12) were previously healthy, with R-IPD (83%) and affected by serotypes 19A (58%) or 3 (25%). No immune deficiency was identified among these subjects.

Conclusion. Pediatric IPD continues to decrease post PCV13 implementation, most notably due to a decrease in PCV13 serotype NR-IPD and disappearance of 7F. We did not see an increase in non-PCV13 IPD. Serotypes 19A and 3 remain a significant proportion of a lower number of cases. Children <5 remain at highest risk for IPD, particularly R-IPD. A notable proportion of PCV13 serotype R-IPD occurred in fully immunized and previously healthy children.

Figure 1. Incidence Rates of IPD/100,000 Population and Percent Change



IPD= invasive pneumococcal disease; R = respiratory; NR = non-respiratory; PCV13 = PCV13 vaccine serotype; NPCV13 = nonPCV13 vaccine serotype
(x%)= percent change from prior time period