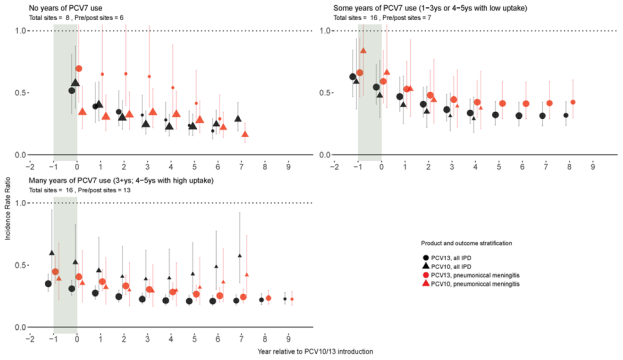
IRRs were estimated using linear mixed-effects regression. Results were stratified by product (PCV10 vs. PCV13) and amount of prior PCV7 use (none; some (1-3 years or 4-5 years with < 70% uptake); or many (≥ 4 years with ≥ 70% uptake).

Results. 40 surveillance sites (9 PCV10, 31 PCV13) in 28 countries, primarily high-income (82%) that had both CSF and IPD data were included in analyses. CSF+ accounted for 9.0% of IPD cases (IQR across sites: 6.2%-15.6%). The rate and amount of decline was generally similar between meningitis and IPD across all strata. At 5 years after PCV10/13 introduction, the IRRs across PCV7-use strata were 0.28-0.32 for pneumococcal meningitis and 0.22-0.43 for all IPD at PCV10-using sites, and 0.27-0.41 and 0.21-0.32, respectively, for PCV13-using sites. Only one site from the African meningitis belt contributed eligible data, which lacked pre-PCV data to estimate IRRs, but incidence rate of both IPD and meningitis decreased following PCV introduction.

Figure 1. All-Site Weighted Average Incidence Rate Ratios, Children < 5 years



* Total sites indicate the number of sites with incidence rate data included and pre/post sites indicate the number of sites with both pre– and post–PCV data to estimate site–specific IRRs for each outcome. The size of point estimates is relative to the number of sites with both pre– and post– data. ** Year 0 indicates the year of PCV10/13 introduction and year –1 indicates the last year of PCV7 use prior to PCV10/13 introduction.

Conclusion. Net declines in all-serotype IPD and CSF+ meningitis in children < 5 years were similar on average for both PCV10 and PCV13. Data from low-income, high-burden, and meningitis-belt regions were limited.

Disclosures. **Maria Deloria Knoll, PhD**, **Merck** (Research Grant or Support)**Pfizer** (Research Grant or Support)

1181. Serotype Distribution by Age of Remaining Invasive Pneumococcal Disease After Long-Term PCV10/13 Use: The PSERENADE Project

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The PSERENADE Team

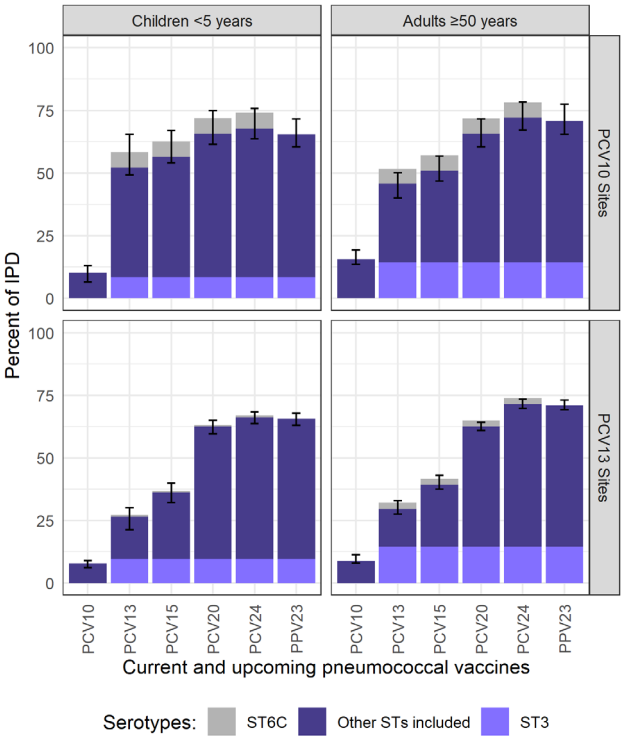
Session: P-69. Pediatric Vaccines

Background. Pneumococcal conjugate vaccines (PCV) have reduced invasive pneumococcal disease (IPD) (see other PSERENADE abstract), of which > 70% was vaccine-type pre-PCV. We described the serotype (ST) distribution of remaining IPD in countries with mature infant PCV10/13 programs.

Methods. IPD ST distribution data were obtained directly from surveillance sites, supplemented with published literature. Mature programs were defined as exclusive use of PCV10 or PCV13 for at least 5-7 years (depended on if prior PCV7 use and/or PCV10/13 catch-up) with primary series uptake > 70%. The distribution was estimated using a multinomial Dirichlet regression, stratified by PCV product and age (< 5 years, ≥ 50 years).

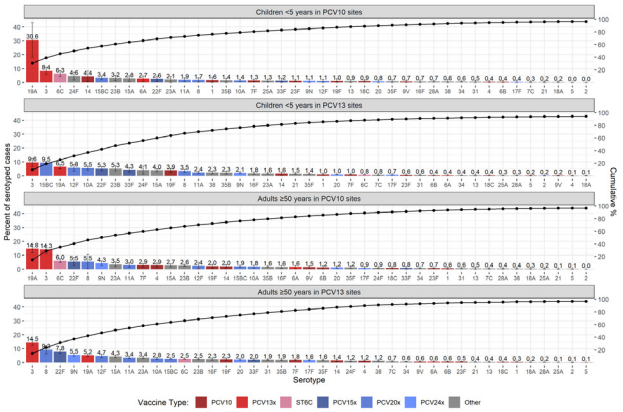
Results. Serotyped IPD cases from 42 PCV13- (n=78,912) and 12 PCV10-using sites (n=8,429) in 41 countries were analyzed. Most sites were from high-income countries (67%) and used a booster dose schedule (81%). For low- and middle-income countries, only 5 and 7 sites had more than 20 eligible cases for children and adults, respectively. In PCV10 sites, 10.0% (95% CI: 6.3-12.9%) and 15.5% (95% CI: 13.4-19.3%) of the remaining IPD during the mature period was PCV10-type among children and adults, respectively (Figure 1). For PCV13 sites, PCV13-type was 26.4% (95% CI: 21.3-30.0%) among children and 29.5% (95% CI: 27.5-33.0%) among adults. PCV20-, PCV24-, and PPV23-type cases ranged from 62-72% across all age and PCV-use groups. ST 19A was the leading ST at PCV10 sites, though more so for children (30.6%, 95% CI: 18.2-43.1%) than adults (14.8%, 95% CI: 11.9-17.8%; Figure 2). ST 3 was a top ST in both PCV10 and PCV13 sites, causing about 9% of cases in children and 14% in adults. ST 6C was the third most common ST in PCV10 sites, causing 6% of cases in both age groups. Some top non-PCV13 STs are included in higher-valent investigational PCVs (15BC, 12F, 22F, 8, 9N) but others are not (24F, 23B, 23A, 15A).

Figure 1. Percentage of IPD cases in the mature PCV10/13 period due to serotypes included in current and upcoming products.



Serotype (ST) 3 is illustrated separately in lighter purple in the bars corresponding to products that include ST3 due to the uncertain effectiveness against ST3 in current products. ST6C is illustrated in grey above the bars where ST6A is included. Although ST6C is not included in PCV10 or PCV13, PCV13 offers cross-protection through ST6A. ST6A also benefits from cross-protection with ST6B, included in both PCV10 and PCV13. Therefore, ST6A causes a very small fraction of disease in both settings and age groups, and it is not shown. Confidence intervals do not include ST6C, as this serotype is not included in PCV10/13. PCV13 is Pfizer's Prevnar13/Prevenar13; PCV10 is GSK's Synflorix.

Figure 2. Serotype-specific distribution of IPD in the mature PCV10/13 period.



Serotypes are colored by the lowest valency PCV product they are included in. The "x" in the PCV legend represents the extra serotypes included in that product relative to the next lower product (i.e., PCV13x includes serotypes 3, 6A, and 19A not in PCV10). Serotype (ST) 6C is colored separately because, although it is not included in any product, it is covered through cross-protection with PCV13-type serotype 6A. PCV13 is Pfizer's Prevnar13/Prevenar13; PCV10 is GSK's Synflorix.

Conclusion. IPD due to vaccine STs was low for both children and adults in countries with mature PCV programs. ST distribution of remaining IPD differed between PCV10 and PCV13 sites and between age groups. Higher-valency PCVs under evaluation target over half of remaining IPD cases, but some prevalent STs are not included in known investigational products.

Disclosures. **Maria Deloria Knoll, PhD**, **Merck** (Research Grant or Support)**Pfizer** (Research Grant or Support)

1183. Serum Bactericidal Activity Induced by Live Attenuated Pertussis Vaccine BPZE1 is Comparable to Boostrix™

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Session: P-69. Pediatric Vaccines

Background. In a Phase 2b, multi-center, placebo-controlled, randomized study, intranasal BPZE1 induced mucosal and serum antibodies to pertussis antigens and protected against subsequent colonization following attenuated challenge with BPZE1 3 months later. Boostrix™ also induced serum but not mucosal antibodies and did not protect against BPZE1 challenge. We have evaluated the induction of serum bactericidal activity (SBA) for *Bordetella pertussis* by BPZE1 or Boostrix vaccination. A previous study showed that Boostrix induction of SBA is dependent on Prn whereas *B. pertussis* infection induces SBA targeting Prn and other antigens.

Methods. A convenience set of subjects who had a broad range of Prn and PT IgG serum concentrations from treatment groups who received BPZE1+BPZE1 or Boostrix+Placebo (Day 1 and 85 vaccination) were randomly selected to assess SBA using *B. pertussis* strain B1917. Three timepoints (baseline, 28 days following first and second vaccination) were analyzed and interpolated 50% killing titers determined. The relationship to Prn IgG concentration was assessed.

Results. BPZE1 and Boostrix elicited similar and significant increases in SBA following vaccination. BPZE1 and Boostrix elicit anti-Prn IgG, with Boostrix eliciting higher concentrations. A greater SBA response relative to PRN IgG was observed for BPZE1 compared to Boostrix. SBA-Prn correlations were high post-Boostrix (0.74) as previously reported; correlation was lower (0.35) following BPZE1, suggesting the involvement of broader antigenic protection beyond Prn alone.

Table of GMT and GMFR in SBA and Prn IgG

Geometric Mean Titers (GMT) and Geometric Mean Fold Rise (GMFR) in SBA and Prn IgG						
Vaccination First (Day 1) + Second (Day 85)	Assay	Baseline (Day 1)	Day 28 following first vaccination (Day 29)		Day 28 following second vaccination (Day 113)	
		GMT (95%CI)	GMT (95%CI)	GMFR* (95% CI)	GMT (95%CI)	GMFR* (95% CI)
BPZE1 + BPZE1 (n=13)	SBA	91.0 (35.0, 238.0)	509.0 (340.0, 764.0)	5.6 (2.7, 11.9)	480.0 (305.0, 754.0)	5.3 (2.5, 11.0)
	Prn IgG IU/ml	47.0 (18.4, 121.0)	159.0 (80.7, 315.0)	3.4 (2.2, 5.3)	137.0 (78.1, 239.0)	2.9 (1.8, 4.7)
Boostrix + Placebo (n=17)	SBA	88.0 (39.0, 196.0)	599.0 (357.0, 1004.0)	6.8 (3.5, 13.2)	345.0 (156.0, 763.0)	3.9 (1.9, 8.2)
	Prn IgG (IU/ml)	31.0 (16.4, 58.7)	352.0 (204.0, 606.0)	11.4 (5.9, 21.8)	205.0 (96.6, 436.0)	6.6 (2.8, 15.8)
*Fold rise from baseline.						

Conclusion. In this exploratory investigation, the novel intranasal live-attenuated pertussis vaccine BPZE1 induced SBA titers that were similar to Boostrix using a *B. pertussis* strain representative of current disease isolates. SBA-Prn correlations were high post-Boostrix, consistent with prior reports showing Prn is the acellular vaccine antigen that mediates SBA. In contrast, BPZE1 bactericidal antibodies appear broader than Prn which may be important given the global rise of Prn-deficient *B. pertussis* strains.

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

1184. A Phase 3, Multicenter, Randomized, Double-blind Study to Evaluate the Interchangeability of V114 and Prevnar 13™ with Respect to Safety, Tolerability, and Immunogenicity in Healthy Infants (PNEU-DIRECTION)

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Session: P-69. Pediatric Vaccines

Background. Pneumococcal diseases (PD) caused by *Streptococcus pneumoniae* are a major health concern globally. In children, currently licensed pneumococcal conjugate vaccines (PCVs) provide protection against PD from vaccine serotypes, but other non-vaccine serotypes have emerged and contribute to most residual disease. V114 is a 15-valent investigational PCV containing serotypes 22F and 33F in addition to the 13 serotypes shared by Prevnar 13™ (PCV13). This phase 3 study evaluated safety and immunogenicity of mixed PCV13/V114 regimens when changing from PCV13 to V114 at doses 2, 3, or 4.

Methods. In this double-blind trial, 900 infants were randomized in equal ratios to five treatment groups using a 3 + 1 immunization schedule (3-dose infant primary series followed by one toddler dose). Groups 2, 3, and 4 started with PCV13 and switched to V114 at doses 4, 3, and 2, respectively. Groups 1 and 5 received four doses of PCV13 and V114, respectively. Immunoglobulin G (IgG) responses to the 15 pneumococcal serotypes in V114 were measured at 30 days post-dose 3, prior to dose 4, and 30 days post-dose 4 (PD4). Primary immunogenicity analysis was based on 13 shared serotype responses at PD4. Safety was evaluated as the proportion of participants with adverse events (AEs).

Results. At 30 days PD4, IgG geometric mean concentrations (GMCs) for the 13 shared serotypes were generally comparable between V114/PCV13 mixed regimens (Groups 2-4) and participants that received the 4-dose PCV13 regimen (Group 1). Additionally, IgG GMCs for the 13 shared serotypes were generally comparable for participants that received the 4-dose V114 regimen (Group 5) and participants that received the 4-dose PCV13 regimen (Group 1). Infants given at least one dose of V114 mounted immune responses to two unique serotypes in V114 (22F and 33F). Frequency of injection-site and systemic AEs among study participants were generally comparable across all study groups.

Conclusion. V114 was well tolerated with a generally comparable safety profile to PCV13. For the 13 shared serotypes, both mixed-dose and 4-dose regimens of V114 induced generally comparable antibody responses to a PCV13 4-dose regimen. Study results support interchangeability of V114 with PCV13 in infants.

Disclosures. **Adroniki Bili, MD**, **Merck & Co., Inc.** (Employee, Shareholder) **Ron Dagan, MD**, **Medimmune/AstraZeneca** (Grant/Research Support, Scientific Research Study Investigator, Research Grant or Support)**MSD** (Consultant, Grant/Research Support, Scientific Research Study Investigator, Advisor or Review Panel member, Research Grant or Support, Speaker's Bureau)**Pfizer** (Consultant, Grant/Research Support, Scientific Research Study Investigator, Advisor or Review Panel member, Research Grant or Support, Speaker's Bureau) **Marissa B. Wilck, MD**, **Merck & Co., Inc.** (Employee, Shareholder) **Waldimir Vallejos, MD**, **Merck & Co., Inc.** (Employee, Shareholder) **Christine Nunn, MS**, **Merck & Co., Inc.** (Employee, Shareholder) **Richard McFetridge, B.S.**, **Merck & Co., Inc** (Employee) **Rong Fu, PhD**, **MSD China** (Employee, Shareholder) **Robert Lupinacci, M.S**, **Merck & Co., Inc** (Employee, Shareholder) **Luwy Musey, MD**, **Merck & Co., Inc.** (Employee) **Kara Bickham, MD**, **Merck Sharp and Dohme** (Employee, Shareholder)

1185. Oseltamivir Prescribing Patterns for Infants with Influenza and Factors Associated with Guideline Adherence

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Session: P-70. Pediatric Viral Studies (natural history and therapeutic)

Background. The Centers for Disease Control and Prevention (CDC) recommends oseltamivir be given to children < 2 years old with confirmed or suspected influenza as they are at high risk for complications. We sought to analyze oseltamivir prescribing patterns and to describe factors associated with adherence and non-adherence to CDC guidelines.

Methods. We used a retrospective cohort of infants ≤ 12 months old born from January 1, 2011 to December 31, 2019 within the University of Pittsburgh Medical Center health system in Southwestern Pennsylvania and who had ≥ 2 well-child visits during their first year. Infants with laboratory-confirmed influenza from January 1, 2011 to April 30, 2020 were included. Electronic health records were reviewed to describe oseltamivir prescriptions and influenza-related characteristics. Factors associated with adherence and non-adherence to CDC influenza treatment guidelines were assessed with univariate logistic regression.

Results. Of 422 infants with laboratory-confirmed influenza, 86% were prescribed oseltamivir. The proportion of infants prescribed oseltamivir increased from an average of 63% during 2011-2016 to 90% during 2016-2020 (OR:5.2; 95%CI: 2.9-9.5). 96% of prescriptions instructed twice daily dosing, 2% had once daily, and 2% were unknown frequency. 91% of prescriptions were for 5 days, 7% had no duration, and 2% were for > 5 days. Infants ≥ 6 months of age compared to < 6 months were less likely to be prescribed oseltamivir (83.3% vs. 100%; p< 0.001); tested for influenza in the emergency room/urgent care (OR: 0.3; 95%CI: 0.2-0.6), or admitted to the hospital (OR:0.5; 95%CI:0.2-0.9). Infants were more likely to be treated with oseltamivir if they had a known influenza positive contact (OR:2.3; 95%CI:1.0-5.2) or had fever ≥ 38.0C (OR:2.0; 95%CI:1.2-3.5). There was no difference in prescribing practices based on history of prematurity or chronic medical conditions.

Conclusion. Adherence to CDC influenza treatment guidelines for infants is high and has improved over time. However, targeted education at high-risk contact points may further improve guideline adherence.

Disclosures. **John V. Williams, MD**, **GlaxoSmithKline** (Advisor or Review Panel member, Independent Data Monitoring Committee)**Quidel** (Advisor or Review Panel member, Scientific Advisory Board) **Judith M. Martin, MD**, **Merck Sharp and Dohme** (Consultant)

1186. Increased Respiratory Syncytial Virus (RSV) Viral Replication Leads to Increased Cytokine Production and Polarized Interferon Response in Infant Mucosal Epithelium

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