1382. Varicella Burden Disease in Argentina: 4 Years after National Vaccination Strategy
Silvina Neyer, MD; María del Valle Juarez, n/a; Marina Pasinovich, MD; Carolina Rancacho, MD; Nathalia Katz, MD; Gabriela Elbert, MD; Marcela López Yunes, n/a; Daniel Stecher, MD; Verónica Luccioni, MD; Martin Saralegui, n/a; Anala Mykietiuk, Director; Carla Vizzotti, n/a; 1Ministerio de Salud y Desarrollo Social de la Nación, Capital Federal, Ciudad Autonoma de Buenos Aires, Argentina; 2Ministry of Heath (Argentina), Ciudad Autonoma de Buenos Aires, Ciudad Autonoma de Buenos Aires, Argentina; 3Ministerio de Salud y Desarrollo Social de la Nación, Capital Federal, Ciudad Autonoma de Buenos Aires, Argentina; 4Ministry of Health (Argentina), Ciudad Autonoma de Buenos Aires, Ciudad Autonoma de Buenos Aires, Argentina; 5Ministry of Health, Ciudad Autonoma de Buenos Aires, Ciudad Autonoma de Buenos Aires, Argentina; 6Director of Control for Immunopreventable Diseases, Ministry of Heath (Argentina), Ciudad Autonoma de Buenos Aires, Ciudad Autonoma de Buenos Aires, Argentina; 7Secretary of Access to Health, Ministry of Halth (Argentina), Ciudad Autonoma de Buenos Aires, Ciudad Autonoma de Buenos Aires, Argentina

Session: P.63. Pediatric Vaccines

Background. In Argentina, around 150,000-180,000 total Varicella (VZV) cases per year (c/y) are registered; however, underreport exists and some 400,000 cases are estimated to occur annually. Varicella vaccine (VV) was included in the National Immunization Schedule (NIS) in 2015, with a 1-dose schedule administered at 15 months-of-age. We aimed to describe and to compare the epidemiological situation of VZV infections in Argentina in two periods: pre (2010-2014) and post (2016-2018) vaccine introduction in NIS.

Results. Global Incidence rates and vaccine coverage

Methods: Before-and-after study comparing cases and incidence rates (100,000) of varicella reported to the National Health Surveillance System between pre-vaccination period (Pre VV) and post-vaccination (Post VV), excluding year of intervention (2015) since it was considered a transition year. Epi Info 7 was used for data analysis.

Results. Vaccination coverage (VC) for 2015 was 44.7%; 74.4% in 2016; 76.8% in 2017 and 81% in 2018 (Figure 1). 728,392 cases of VZV were notified (R=363.1) in Argentina, with an estimated total VZV burden of 170,000-200,000 cases/year. There was a significant reduction in VZV cases, incidence rate, hospitalizations, and deaths after VV introduction in 2015. The impact of vaccination was more pronounced in children aged 2-4 years old groups (Pre-VV R=2,253 and Post-VV R=900; Pre-VV R=2,399 and Post-VV R=875, respectively) showed the greatest reductions in incidence rates (-59.3% [95%CI 58.7-60] p<0.001 and -61.7% [95%CI 61.3-62] p<0.001). Age groups not affected by vaccination (<1 year, 5-9 years and 10-14 years) presented minor but significant reductions (-56.4% [95%CI 55.6-57.3] p<0.001; -35% [95%CI 34.5-35.4] p<0.001; and -28.6% [95%CI 27.6-29.7] p<0.001 respectively) (Figure 2).

Conclusion. A decreasing trend in VZV number of cases and incidence rates was observed, especially in children less than 5 years old, despite suboptimal VC.

1383. Characterizing Real-world Patterns of Early Childhood Vaccination
Anne M. Butler, PhD; Jason Newland, MD, MFMP; PFIDDS; John Sahrmann, MS;
Caroline O’Neil, MA, MPH; Sena Saywood, MD; Leah McGrath, PhD; Washington University in St. Louis, St. Louis, Missouri; 2Washington University, St. Louis, Missouri; 3Washington University School of Medicine, St. Louis, MO; NoviSci, Inc, Durham, North Carolina

Session: P-63. Pediatric Vaccines

Background. Vaccine hesitancy is increasingly common, but more information is needed on patterns of childhood vaccination. We characterized patterns of vaccine coverage and other vaccination behaviors among commercially-insured children in the U.S.

Methods. Using the IBM MarketScan Commercial Database, we identified infants who received a timely first dose of diptheria-tetanus-acellular pertussis (DTAP) vaccine from October 2009 to June 2017. We used CPT codes to collect vaccine administration history on infants, including, formulation, dose, and date. We ascertained injectable and oral vaccine antigens (DTaP, polio, pneumococcal conjugate, rotavirus, Haemophilus influenza type b (Hib), measles, mumps, rubella, varicella). Timely receipt was defined as concomitant administration of the CDC-recommended number of antigens during the following time windows: 2-4, 4-6, and 12-15 months of age (grace period: 7, +21 days). We generated heat maps to illustrate age distributions at receipt of specific antigens and doses. We created Sankey diagrams to illustrate the number of antigens received concomitantly during each time window and depict transitions to different states over time (e.g., no vaccine delay to vaccine delay). For each antigen and dose, we estimated the cumulative incidence of receipt.

Results. Among 1,066,216 eligible infants, the majority (84%) concomitantly received all 5 CDC-recommended antigens at 2 months of age while others only received 1 (1%), 2 (2%), 3 (4%) or 4 (9%) antigens. Many vaccinations were delayed - 30% and 39% of children did not receive all recommended antigens concomitantly at 4 and 6 months, respectively. The heat map shows wide variation in age at vaccination. For several antigens including Hib, measles, mumps, rotavirus, rubella, and varicella, the cumulative incidence increased steeply at ≥2 time points, suggesting vaccine delay for some infants (e.g., the first dose of Hib was administered to 85% of infants by 2 months of age, with subsequent small but distinct increases at 4, 6, 12, and 15 months of age).

Conclusion. Using real-world data to study early childhood vaccination patterns, we observed evidence of substantial deviation from the CDC-recommended schedule. These results expand current knowledge on the magnitude and timing of antigen- and dose-specific vaccine delay on a population level.

Disclosures. Jason Newland, MD, MFEd, PFIDDS, Merck (Grant/Research Support); Pfizer (Other Financial or Material Support); Industry funded clinical trial)
Leah McGrath, PhD, NoviSci, Inc, (Employee)

1384. Conceptual Economic Model Methodology for Infant Pneumococcal Conjugate Vaccine Program and its Impact on Antimicrobial Resistance
Raymond Farkouh, PhD; 1Arianna Nevo, MPH; Jennifer Uyi, PhD, MPH; Benjamin Alhhouse, PhD, ScM; Cassandra Hall-Murray, PharmD2; Joseph Lewnard, PhD; Matthew Wasserman, MSc; 3Pfizer, Inc., Colleghville, Pennsylvania; 4FOVIA, San Francisco, California; 5Institute for Disease Modeling, Seattle, Washington; 6University of California Berkeley, Berkeley, California

Session: P-63. Pediatric Vaccines

Background. Antimicrobial resistance (AMR) is a global threat to effective prevention and treatment of an ever-increasing range of infections. Pneumococcal conjugate vaccines (PCV) used in infant national immunization programs have been shown to decrease AMR pneumococci. Cost-effectiveness models evaluating the value for money of PCV programs have not considered the economic impact of reducing anti-microbial prescribing or prolonged infections due to treatment failures. Standardized frameworks are needed for models to address outcomes and impact on health resource utilization related to AMR.

Methods. We developed a conceptual modeling methodology suitable for a health economic evaluation of an infant PCV program. We considered impact of PCVs on pneumococcal disease (PD) specifically related to clinical management of AMR-PD, including AMR epidemiology, antibiotic prescribing patterns, and healthcare resource utilization. Model inputs were evaluated regarding optimal and available data sources considering the complex nature of AMR at the national, regional, and global level.

Results. The proposed framework considers impact of PCVs on antimicrobial prescribing due to invasive pneumococcal disease (IPD), community acquired pneumonia (CAP), and acute otitis media (AOM) across 3 pathways (Figure 1). The population and pathogen-level pathway describe epidemiology and vaccine impact. The care level pathway describes clinical disease management. The health outcomes pathway characterizes resistant or successfully treated PD costs and quality of life.

Disclosures. All Authors: No reported disclosures
**Conclusion:** We present a generalizable methodology to quantify impact of PCVs on cases and outcomes of PD related to AMR. Modelling vaccine-preventable burden of AMR-PD requires data extrapolations and assumptions due to the myriad of interconnected pathways (i.e. microbiology, epidemiology, environment, health systems). Further work is needed to validate assumptions and linkages across incomplete data sources.

**Disclosures.** Raymond Farkouh, PhD, Pfizer (Employee) Arianna Nevo, MPH, Pfizer, Inc. (Other Financial or Material Support, I am an employee of IQVIA. IQVIA received funding from Pfizer to carry out the project.) Jennifer Uyei, PhD, MPH, Pfizer, Inc. (Other Financial or Material Support, I am an employee of IQVIA. IQVIA received funding from Pfizer to carry out the project.) Cassandra Hall-Murray, PharmD, Pfizer, Inc. (Employee) Joseph Lewnard, PhD, Pfizer, Inc. (Consultant, Grant/Research Support, Advisor or Review Panel member) Matthew Wasserman, MSc., Pfizer Inc. (Employee)

**1385. Concomitant Administration of Liquid Porcine Circovirus-free Human Rotavirus Vaccine with Routine Pediatric Vaccines Does Not Impact Immune Responses in Infants: Results from a Phase 3, Randomized Trial in the United States**

Remon Abu-Elyazeed, MD, PhD; Nicola P. Klein, MD, PhD; Leentje Moerman, PhD; Michael Povey, MSc; Anthony Pruitt, MD; Shelly Senders, MD; Peter Silas, MD; Dan Ri, MD, MPH; GSK, Philadelphia, Pennsylvania, United States; Peter Silas, MD, Wee Care Pediatrics, Roy, Utah, United States; Shelly Senders, MD, Senders Pediatrics, Cleveland, Ohio, United States; Euclid, Ohio; Wee Care Pediatrics, Syracuse, UT

**Rota-090 Study Group**

**Session:** P-63. Pediatric Vaccines

**Background.** Porcine circovirus type 1 (PCV-1) material was detected in the human rotavirus vaccine (HRV) in 2010. Although no safety risk was identified for infants vaccinated with HRV, a PCV-free HRV (no detection of PCV-1 and PCV-2 according to the limit of the tests used) was developed, which showed comparable immunogenicity and safety profile to the initial HRV. We assessed the non-inferiority of immune responses elicited by routine vaccines (co-)administered with either liquid (Liq) PCV-free HRV or lyophilized (Lyo) HRV, and the immunogenicity and safety of HRVs in infants.

**Methods.** In this phase 3, randomized, single-blind study (NCT03207750) in the United States, healthy infants aged 6–12 weeks received 2 doses of Liq PCV-free HRV or Lyo HRV at study month (M)0, M2 and routine vaccines at M0, M2, M4 (Figure 1). Co-primary objectives were to hierarchically demonstrate non-inferiority of immune responses to routine vaccine antigens when (co-)administered with liquid (Liq) PCV-free HRV or lyophilized (Lyo) HRV, and the immunogenicity and safety of HRVs in infants.

**Results.** 1272 infants were vaccinated and 990 (Liq PCV-free HRV: 489; Lyo HRV: 501) were included in the per-protocol set. All statistical criteria were met for the 2 co-primary objectives (Table 1). Seroprotection/serositivity rates were ≥ 99.3% for all DTaP-HBV-IPV antigens, ≥ 97.4% for Hib and ≥ 90.8% for most PCV13 serotypes. Geometric mean concentrations/titers for the routine vaccine antigens were comparable between groups (Table 2). 76.3% of infants in Liq PCV-free HRV and 78.9% in Lyo HRV had anti-RV antibody concentration ≥ 20 U/mL. The incidence of solicited (Figure 2) and unsolicited adverse events (AEs) were similar in both groups. Of 75 serious AEs (SAEs), 2 (Lyo HRV: abdominal distension; intussusception) were considered vaccine-related by investigator; 1 fatal SAE (Liq PCV-free HRV: sudden infant death syndrome) was considered non-vaccine related by investigator.

Table 1. Non-inferiority of the immune responses to routine vaccine antigens when (co-)administered with HRV (Liq PCV-free HRV vs Lyo HRV) and exclusion of 10% decrease in seroresponse to pertussis antigens, 1 month post-dose 3 (per-protocol set)

| Statistical criteria | Antigen | Assessed outcome |
|----------------------|---------|-----------------|
| LL of 2-sided standard error % for the difference in % of infants with anti-D and anti-A antibody concentration ≥ 0.1 lg/ml between groups ≥ 30.00% | Anti D Anti A | Liq PCV-free HRV – Lyo HRV % difference | 0.09% (90% CI: 0.01% – 0.18%) |
| LL of 2-sided standard error % for the difference in % of infants with anti-HIB antibody concentration ≥ 0.5 lg/ml between groups ≥ 30.00% | Anti HIB | Liq PCV-free HRV – Lyo HRV % difference | 0.03% (90% CI: 0.00% – 0.06%) |
| LL of 2-sided standard error % for the difference in % of infants with anti-penta-1, 2, 3, 4 antibody level > 0.5 lg/ml between groups ≥ 50.00% | Anti-penta 1 Anti-penta 2 Anti-penta 3 Anti-penta 4 | Liq PCV-free HRV – Lyo HRV % difference | 0.21% (90% CI: 0.10% – 0.31%) |
| LL of the 2-sided 95% CI of anti-PT, anti-PV and anti-PRV antibody GMC ratio (≤ 0.87) | Anti-PT Anti-PV Anti-PRV | Liq PCV-free HRV – Lyo HRV GMC ratio | 0.94% (90% CI: 0.80% – 1.10%) |
| LL of the 3-sided 95% CI of antibody GMC ratio ≥ 0.5, for each of the 13 pneumococcal serotypes | Anti PnV3 Anti PnV5 Anti PnV6 Anti PnV7 Anti PnV8 Anti PnV10 Anti PnV11 Anti PnV13 | Liq PCV-free HRV – Lyo HRV GMC ratio | 1.05% (90% CI: 1.00% – 1.10%) |
| LL of 2-sided standard error % for the difference in % of infants with anti-Hb antibody concentration ≥ 0.1 lg/ml between groups ≥ 50.00% | Anti Hb | Liq PCV-free HRV – Lyo HRV % difference | 0.07% (90% CI: 0.03% – 0.13%) |
| LL of 2-sided standard error % for the difference in % of infants with anti-Hb antibody concentration ≥ 0.1 lg/ml between groups ≥ 50.00% | Anti Hb | Liq PCV-free HRV – Lyo HRV % difference | 0.07% (90% CI: 0.03% – 0.13%) |

**Figures:**

- **Figure 1. Study design**
- **Figure 2. Solicited adverse events**
- **Table 1. Non-inferiority of the immune responses to routine vaccine antigens when (co-)administered with HRV (Liq PCV-free HRV vs Lyo HRV) and exclusion of 10% decrease in seroresponse to pertussis antigens, 1 month post-dose 3 (per-protocol set)**

**Table 2.** Seroprotection/serositivity rates for the routine vaccine antigens are comparable between groups (Table 2).