Results. An estimated 39.66% (95% CI 38.07%, 41.25%) of Asian adults living in the US received HBV vaccination. Vaccination prevalence among male Asian adults was lower than their female counterparts 38.05% (95% CI 35.66%, 40.44%) vs. 41.09% (95% CI 38.96%, 43.21%). Among Asian adults, the adjusted odds ratio (AOR) of HBV vaccination for females was 1.20 (95% CI 1.04, 1.39) times higher than males. The AOR of first dose VZV vaccination were significantly higher when compared with white 1.21 (95% CI 1.03, 1.41), 1.29 (95% CI 1.10, 1.51), respectively for Chinese and Filipino Adults. We observed significant gender disparities in HBV vaccination AOR for Asian-Indian and Chinese adults. In both groups, females had higher AOR of HBV vaccination when compared with males, Asian-Indian 1.42 (95% CI 1.04, 1.94) and Chinese 1.39 (95% CI 1.07, 1.80).

Conclusion. Among Asian-Indian and Chinese adult residents of the United States, the association between race and HBV vaccination status differs by gender, with males having lower vaccination rates than females. Healthcare resources should be directed to these target populations to improve these rates.

Disclosures. V. Rustgi, Genfit: Grant Investigator and Investigator, Research support. Gilead: Speaker’s Bureau, Speaker honorarium. Abbvie: Speaker’s Bureau, Speaker honorarium.

2476. Impact of the Vaccination Strategy on Varicella Burden Disease in Argentina

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Background. Varicella (VZV) is one of the most frequent exanthematous diseases in childhood. In Argentina, around 150,000-180,000 total cases per year 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. The information provided by epidemiological surveillance is essential to evaluate the impact of public health decisions. Our objective was to describe and to compare the epidemiological situation of VZV infections in Argentina in two periods: pre (2010–2014) and post (2015-2017) vaccine introduction in NIS.

Methods. Descriptive study. We compared cases and incidence rates (R) of VZV per 100,000 population (global and disaggregated by age) reported to the National Health Surveillance System; in pre (Pre-VV) and post-vaccination (Post-VV) periods. Data analysis of 2015 was excluded since it was considered a transition year.

Results. Vaccination coverage for 2015 was 44.7%; 74.4% in 2016 and 75.5% in 2017. 728,392 cases of VZV were notified (R = 362,1) in Pre-VV period and 176,995 cases in Post-VV (R = 220.6), with a global incidence rate reduction of 39% [IC 95% =38.9–39.6, P < 0.001]. Both 12–24 months of age and 2–4 years old groups (Pre-VV R 2,253 and Post-VV R 1,077; Pre-VV R 2,400 and Post-VV R 1,165, respectively) showed the greatest reductions in incidence rates (–52.2% [IC 95% 51.3–53.5] P<0.001 and –51.4% [IC 95% 51–52] P<0.001). Besides, age groups not affected by vaccination (≤1 year, 5–9 years, and 10–14 years) presented significant reductions (–49.1% [IC 95% 44.5–53.4] P<0.001; –23% [IC95% 22.4–23.6] P<0.001, and –17% [IC95% 16.4–19] P<0.001, respectively).

Conclusion. Three years after the implementation of VZV vaccination strategy, a significant incidence rate reduction is recorded, especially in children ≤5 years old, despite suboptimal coverage. Improving vaccination coverage will likely reflect a greater impact on the burden of disease.

Disclosures. All authors: No reported disclosures.

2477. Impact of Varicella Vaccination in the United States (US): A Dynamic Model-Based Analysis

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Background. Routine childhood immunization with varicella vaccine was first recommended in the United States in 1995 as a 1-dose regimen for children aged 12–18 months, with updated recommendations in 2006 for a 2-dose regimen (first dose at 12–15 months and second dose at 4–6 years). Our objective was to estimate the impact of the US varicella vaccination program.

Methods. We developed a dynamic transmission model to predict the impact on varicella vaccination on health outcomes in the United States. Vaccine coverage rates were extracted from the US National Immunization Survey (NIS); first dose varicella vaccine coverage went from 12% in 1996 to 91% by 2016 for children 18 months old, and second dose coverage starting in 2006 at 5% increasing by 2016 to 94% for children 5 years old; we assumed that 50% of children with no history of vaccination or infection by age 13 would become vaccinated. Interactions between age groups were empirically characterized, and the model was calibrated using age-specific pre-vaccination varicella incidence data. Vaccine effectiveness was represented via vaccine take and waning immunity estimated from a 10-year trial.

Results. The model projected reductions of varicella incidence in all ages (and ages <15 years) of 46% (46%) in 2001, 76% (76%) in 2006, 78% (81%) in 2011, and 89% (93%) in 2016 (Figure 1). The projected reductions in varicella cases and varicella-related hospitalizations and deaths for all ages were 74%, 70%, and 66% by 2006 (one-dose era), respectively, increasing to 89%, 70%, and 69% by 2016 (two dose era), respectively (Figure 2). We estimate that between 1996 and 2016, 71,885,382 cases of varicella were prevented in the United States, together with 178,248 varicella-related hospitalizations and 1,496 deaths.

Conclusion. Our estimates are slightly lower than previously reported US surveillance data which identified a 97.4% (92.9%-97.9%) reduction between 1993-1994 and 2013–2014 in IL, MI, TX, and WV (WER 2016). Likely, this difference is related to under ascertainment of milder cases. This model can be used to estimate the public health benefits of varicella vaccination. The use of a dynamic transmission model does, however, have limitations, including assumptions about age-specific risk and severity of breakthrough disease and the use of a static population.

Disclosures. L. Wolfsön, Merck & Co., Inc.: Employee and Shareholder, Salary. J. Kyle, Merck & Co., Inc.: Independent Contractor, Salary. B. Kuter, Merck: Employee and Shareholder, Salary. M. Levin, Merck Sharp & Dohme Corp.: Scientific Advisor, Consulting fee, Licensing agreement or royalty and Research grant. V. Daniels, Merck & Co., Inc.: Employee and Shareholder, Salary.

2478. Impact of 20 Years of Varicella Vaccination on the Epidemiology of Herpes Zoster in the United States: An Interrupted Time Series Analysis

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Background. The mechanism for reactivation of varicella zoster virus as herpes zoster (HZ) is not well understood. One hypothesis postulates that re-exposure to circulating wild-type varicella can boost individual immunity and prevent reactivation (“Exogenous Boosting”, EB). The validity of this hypothesis has been debated.
and the evidence to evaluate it is limited. Dynamic transmission model outcomes of impact and cost-effectiveness of universal varicella vaccination (UVV) are sensitive to EB characterization and assumptions, occasionally leading to conclusions that UVV programs may not be cost-effective and could lead to temporary increases in HZ incidence. The goal of this study was to use data from 20 years of UVV in the United States from 1996 to 2016 to evaluate whether the hypothesized increases in HZ incidence have been realized.

Methods. This is a retrospective study of de-identified administrative claims data from the US MarketScan® databases between 1991 and 2016. The incidence of HZ was analyzed by calendar year and age category using interrupted time series (ITS) analysis implemented through a negative binomial generalized linear regression model over three time periods: pre-UVV (1991–1995); 1 dose UVV (1996–2006); and 2 dose UVV (2007–2016). The ITS approach (Bernal et al., HE, 2017) is an effective way to evaluate the impact of public health interventions implemented at specific time points.

Results. HZ incidence in the pre-UVV period increased at annual rates between 3.67% and 12.38%, with the highest increases in the 0–17 and 65+ age groups. The rate of HZ increase was lower in the 1 dose UVV period compared with the pre-UVV period for all age groups except for minor increases in the 18–35 (0.52%) and 55–65 (0.14%) groups. During the 2 dose UVV period, the rate of increase in HZ was lower in all groups than in the pre-UVV period, with the largest reductions in the 0–17 (~22.58%), 65+ (~10.68%), and 18–35 (~3.57%) age groups.

Conclusion. This evaluation of the impact of UVV on rates of change in HZ does not support the hypothesis of an increase in HZ incidence due to UVV. While overall HZ incidence rates have been increasing year on year, the rate of that increase has been declining in both UVV periods. Our findings have implications on the assumptions used in economic evaluations of UVV programs.

Disclosures. L. Wolflon, Merck & Co., Inc.: Employee and Shareholder, Salary. V. Daniels, Merck & Co., Inc.: Employee and Shareholder, Salary. Y. Chen, Merck & Co., Inc.: Employee and Shareholder, Salary.

2479. Varicella Zoster Immune Globulin Is Effective up to 10 Days Following Varicella Exposure in Pregnant Women, Immunocompromised Patients, and Infants: Results From a Large, Open-Label Expanded-Access Program

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Background. There are more than 300,000 cases of varicella annually; non-immune individuals exposed to varicella-zoster (VZ) virus have a high likelihood of developing varicella. VZ immune globulin (VZIG) is used for postexposure prophylaxis with limited effectiveness in high-risk subjects exposed to varicella. Subjects included immunocompromised children/adults, infants (including preterm infants, newborns whose mothers had VZ infection <5 days before or <2 days after delivery, and infants <1 year of age), and pregnant women. VZ immune globulin (125 IU/10 kg [up to 625 IU]) was administered intramuscularly, ideally ≥96 hours, but up to 10 days postexposure. Incidence of varicella rash and severity (>100 pox, pneumonia, encephalitis) were assessed up to 42 days after administration.

Results. The efficacy population (n = 505) included 263 immunocompromised subjects (32 adults, 231 pediatric), 137 pregnant women, and 105 infants. More than 97% of exposures fit the CDC definition. Varicella incidence was low in immunocompromised subjects (4.5%, n = 12/269), pregnant women (7.3%, n = 10/137), and infants (11.4%, n = 12/105) and was similar when comparing administration ≤ 96 hours vs. up to 10 days postexposure (6.2% vs. 9.4%, respectively). Of 34 subjects with varicella, 54% were exposed in the household, 5 were considered severe. Common adverse events were pyrexia (4%), neutropenia (3%), and headache (3%). There were no prodromal deaths and only 1 serious adverse event (serum sickness) considered probably related to VZ immune globulin.

Conclusion. Postexposure administration of VZ immune globulin resulted in low rates of varicella in high-risk subjects, regardless of administration timing within 10 days postexposure. VZ immune globulin—which is FDA-approved, recommended by the CDC, and widely available—was well tolerated and safe in high-risk subjects.

Disclosures. M. Levin, Merck: Consultant and Scientific Advisor, Consulting fee and Research support. Y. T. Chen, Merck & Co., Inc., Center for Observational and Real World Evidence, Kenilworth, New Jersey. YOLARX Consultants, Montreal, QC, Canada

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Background. Several studies of the real-world effectiveness of Zostavax®, a live zoster vaccine (ZVL), have been published since its licensure in 2006. The objective of this review was to summarize available evidence on vaccine effectiveness (VE) of ZVL against herpes zoster (HZ) and post-herpetic neuralgia (PHN) in the general population.

Methods. An extensive literature search was performed in Embase and Medline for the period January 2007 to January 2018 to identify peer-reviewed, original, English study manuscripts reporting the results of observational studies of ZVL VE. In all studies, HZ cases were identified from HZ diagnosis codes, with only two studies also requiring HZ-specific antiviral use. For PHN, different case definitions were used across studies, usually without validation from medical chart review.

Results. Seven original effectiveness studies were identified (5 from the United States and 1 each from the UK and Canada) that assessed HZ effectiveness in the general population. Five of these studies also assessed PHN effectiveness. Vaccine effectiveness to prevent HZ was similar across studies in the early years following vaccination, but tended to diverge in the later years (overall VE against HZ ranged from 33% to 62%, clustering around ~50% across studies providing this information). Overall VE against PHN ranged from 55% to 88%, clustering around ~65%.

Conclusion. Real-world observational studies assessing the effectiveness of ZVL in preventing HZ and PHN in the general population reported generally similar results. Differences in VE estimates across studies were likely driven by differences in study design and methods, including sample size and age of study population, HZ and PHN case definition, duration of follow-up, and methods of covariate selection, definition and adjustment. We are currently conducting a meta-analysis to identify and quantify the potential heterogeneity across studies and calculate summary VE estimates.

Disclosures. M. A. Marks, Merck & Co., Inc.: Employee and Shareholder, Salary. M. A. Marks, Merck & Co., Inc.: Employee and Shareholder, Salary. S. Calhoun, Merck & Co., Inc.: Employee, Salary. K. Johnson, Merck & Co., Inc.: Employee, Salary. Y. Moride, Merck: Research Contractor, Consulting fee.

2481. Impact of Sex and Race/Ethnicity on the Effectiveness of Live Zoster Vaccine

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Session: 253. Vaccines for Herpes Zoster Virus Saturday, October 6, 2018: 12:30 PM

Background. Zostavax®, a live zoster vaccine licensed as 1 dose, is indicated in the United States for the prevention of herpetic zoster (HZ) in people 50 years or older. Real-world vaccine effectiveness (VE) and duration of protection are being evaluated in an ongoing study. Compared with randomized clinical trials, this large observational study includes a more diverse population and offers a unique opportunity to assess VE across sex, race/ethnicity, and health/insurance groups.

Methods. Kaiser Permanente Northern California members enter the ongoing cohort study when age-eligible for zoster vaccine, starting in 2007. Incident HZ is defined as a new HZ diagnosis accompanied by an antiviral prescription or a positive varicella-zoster virus test, with an HZ diagnosis in the preceding 12 months. VE by sex...