that a proportional decrease in list price decreased the ICER disproportionally in favor of adding a single dose of PCV13.

Conclusion. Expanding the recommendation of only PPV23 to PCV13—PPV23 among Dutch adults aged 60 years and older is a cost-effective use of healthcare resources. In particular adding a single dose of PCV13 for those with moderate or high risk of pneumococcal disease was shown to be cost-effective in comparison with controls.

Disclosures. M. Rozenbaum, Pfizer: Employee and Shareholder, Salary.

143.5. The Cost-Effectiveness of Vaccinating With an Adjuvanted Trivalent Influenza Vaccine for the 65+ Population in Argentina

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Background. Despite the current vaccination program in Argentina for older adults a low influenza continues to have severe consequences. Estimates based on Argentinian information surveillance system suggest that influenza-like illness reaches an average rate of 3,570/100,000 annually, a hospitalization rate of 15.5/100,000 and a death rate of 0.32/100,000 in OA aged 65+. The high burden of disease in this population is in part due to immunosenescence and the resulting suboptimal clinical effect of influenza vaccines in this age group. There is an unmet clinical need in those aged 65+ for an influenza vaccine that offers enhanced protection. The objective of this study was to evaluate the cost effectiveness (CE) of the MF59 adjuvanted vaccine (aTIV) in Argentina compared with current vaccination policy with an un-adjuvanted vaccine (TIV).

Methods. A static decision tree CE model of aTIV was developed to estimate the cost effectiveness compared with TIV vaccine in those aged 65+ in Argentina. The model considered direct and indirect benefits of vaccination in an influenza season from the payer and the societal perspective. The main outcomes include events, death, LLY, QALYs, and costs. To the extent possible, model inputs were sourced from Argentina, in case local data were insufficient, international inputs were utilized. Vaccine efficacy assumptions were extracted from recent literature search.

Results. Using aTIV instead of TIV resulted in additional 530 deaths averted and 3,980 incremental quality-adjusted life-years (QALYs) gained. The incremental cost-effectiveness compared with TIV vaccine in those aged 65+ in Argentina compared with TIV vaccine was highly cost-effective meeting the threshold of one GDP per capita in Argentina. From a societal perspective, a proportional decrease in list price decreased the ICER disproportionally in favor of adding a single dose of PCV13. In non-Whites, family duty/safety also had significant coefficients. Descriptive statistics were used to compare the persuasive effectiveness of these messages to conventional vaccine information. More than racial and ethnic subpopulations, the disparate population was persuaded to receive the vaccine safety information and family duty/safety also had significant coefficients. Descriptive statistics were used to compare the persuasive effectiveness of these messages to conventional vaccine information.

Conclusion. The survey instrument of attitudinal questions related to pneumococcal vaccination was administered via TourGov, an online public national survey house in 70 countries to collect geographically and language specific survey data. The survey assessed socio-economic information and linked to attitudinal question responses. Respondents were randomly assigned into subsamples that received different science-based messages that included information on pneumococcal vaccines related to: pneumonia prevention, fatality/consequences, vaccine safety information, family duty/safety, and a combined vignette including all of these. Because of the random assignment, any differences observed in the respondents’ outcomes across subsamples can be attributed to the messages. Descriptive statistics were used to compare the persuasive effectiveness of these messages to conventional vaccine information.

Results. A total of 2,680 respondents, 1,327 (51%) white and 1,281 (49%) non-white (over-sampled) were represented. Of the total respondents as well as in white, and non-white respondents, the combined vignette was associated with positive coefficients: 0.26, b = 0.24, and 0.26, b = 0.24, respectively. In non-Whites, family duty/safety was the only additional message with a significant coefficient b = 0.25 (P = 0.067).

Conclusion. In this survey assessing attitudes toward pneumococcal vaccination across racial and ethnic subpopulations, the disparate population was persuaded to receive the vaccine only when family duty and safety were linked within the informational messages. Future studies implementing this informational messaging strategy should be performed to validate this finding.

Disclosures. A. Caffrey, Pfizer Pharmaceuticals: Consultant, Consulting fee; Seqirus: Consultant, Consulting fee; Dynavac: Consultant, Consulting fee; Sequis: Consultant, Consulting fee; SutrO Vac: Consultant, Consulting fee; Shionogi: Consultant, Consulting fee.

143.7. Family Duty and Safety Linked to Overcoming Attitudinal Barriers to Adult Pneumococcal Vaccination in Disparate Populations

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Background. Minority adult populations are at a higher risk for invasive pneumococcal disease and also have significantly lower vaccination rates when compared with the general population. Ingrained attitudes are a significant barrier to receipt of pneumococcal vaccine in these disparate populations, and therefore we tested targeted informational messaging to overcome these.

Methods. A survey instrument of attitudinal questions related to pneumococcal vaccination was administered via TourGov, an online public national survey house in 70 countries to collect geographically and language specific survey data. The survey assessed socio-economic information and linked to attitudinal question responses. Respondents were randomly assigned into subsamples that received different science-based messages that included information on pneumococcal vaccines related to: pneumonia prevention, fatality/consequences, vaccine safety information, family duty/safety, and a combined vignette including all of these. Because of the random assignment, any differences observed in the respondents’ outcomes across subsamples can be attributed to the messages. Descriptive statistics were used to compare the persuasive effectiveness of these messages to conventional vaccine information.

Results. A total of 2,680 respondents, 1,327 (51%) white and 1,281 (49%) non-white (over-sampled) were represented. Of the total respondents as well as in white, and non-white respondents, the combined vignette was associated with positive coefficients: 0.26, b = 0.24, and 0.26, b = 0.24, respectively. In non-Whites, family duty/safety was the only additional message with a significant coefficient b = 0.25 (P = 0.067).

Conclusion. In this survey assessing attitudes toward pneumococcal vaccination across racial and ethnic subpopulations, the disparate population was persuaded to receive the vaccine only when family duty and safety were linked within the informational messages. Future studies implementing this informational messaging strategy should be performed to validate this finding.

Disclosures. A. Caffrey, Pfizer Pharmaceuticals: Consultant, Consulting fee; Seqirus: Consultant, Consulting fee; Dynavac: Consultant, Consulting fee; Sequis: Consultant, Consulting fee; SutrO Vac: Consultant, Consulting fee; Shionogi: Consultant, Consulting fee.

143.8. Uptake of 13-Valent Pneumococcal Conjugate Vaccine in High-Risk Adults Aged 19–64 Years: A Kaplan–Meier Approach

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Background. Coverage estimates for pneumococcal vaccination in the United States come from the National Health Interview Survey (NHIS) and do not differentiate between 13-valent conjugated vaccine (PCV13) and 23-valent polysaccharide vaccine (PPSV23). This study was conducted to assess coverage of PCV13 among adults more likely than controls to have a chronic condition (heart, liver, or lung disease, diabetes, cochlear implant, alcohol abuse, smoking; 82% vs. 59%), immunosuppression (60% vs. 32%), poor functional status (score of ≥ 3; 71% vs. 50%), annual household income <$30,000 (38% vs. 25%) and education level of high school or less (36% vs. 25%). In a multivariable model, case patients were more likely than controls to have a chronic condition (OR 2.48, 95% CI 1.72, 3.58), immunosuppression (OR 2.56, 95% CI 1.92, 3.42), poor functional status (OR 3.66, 95% CI 2.42, 5.54), and primary or secondary smoking exposure (OR 3.09, 95% CI 1.32, 7.2). In analysis limited to PCV13-type cases and matched controls, adjusting for PCV13 receipt, measures of association were no longer significant for chronic conditions (OR 1.45, 95% CI 0.71, 2.95), immunosuppression (OR 1.51, 95% CI 0.83, 2.74), or poor functional status (OR 1.98, 95% CI 0.91, 4.3).

Conclusion. Chronic and immunosuppressive conditions remain IPD risk factors among adults in the era of PCV13 use; poor functional status was also identified as a risk factor. Targeted evaluation of adults with poor functional status could inform IPD prevention strategies. PCV13 may reduce the risk of PCV13-type IPD associated with chronic conditions and poor functional status.

Disclosures. W. Schaffner, M.D., Member, Data Safety Monitoring Board, Consulting fee; Pfizer; Pfizer, Member, Data Safety Monitoring Board, Consulting fee; Dynavac; Pfizer, Consulting fee; Sequis; Consultant, Consulting fee; SutrO Vac; Consultant, Consulting fee; Shionogi; Consultant, Consulting fee.
Aged 19–64 years targeted by the high-risk recommendation issued by the Advisory Committee on Immunization Practices (ACIP) in 2012.

**Methods.** Uptake was evaluated from October 2012 through October 2016 in two statistically de-identified datasets: Optum's Clinformatics™ Data Mart (CDM), consisting of administrative health claims, and the Optum-UMeda Electronic Health Record (EHR) database, which includes EHR data from providers, primarily integrated delivery networks in the United States to cover the continuum of care. Eligibility for the recommendation was determined between October 2011 and October 2016 and served as the index event. Post-index PCV13 uptake was evaluated using prescription and administration codes. Patients with PCV13 prior to the recommendation were excluded to minimize miscategorization of PCV13 status. Uptake was calculated using a Kaplan–Meier estimator, with separate estimates for the period before and after the 2014 ACIP age-based recommendation for all adults aged ≥65 years.

**Results.** Uptake of PCV13 was lower among 1,888 patients in the CDM vs. 571,993 patients in the EHR dataset, with <15% of recommended high-risk patients receiving PCV13 in the 4 years following publication of the recommendation. Vaccination among 19- to 64-year-old high-risk patients accelerated after the October 2014 publication of the recommendation for all adults aged ≥65 years. This was consistent in both CDM and EHR databases (Table 1).

**Conclusion.** Uptake of PCV13 among high-risk adults aged 19–64 years in the US has been very low. Some of the PCV13 vaccination among high-risk patients may have been driven by spillover from the subsequent age-based recommendation for adults aged ≥65 years.

### Table 1. KM Estimates at the End of the Study with 95% CI

| Uptake Rate | CI          |
|-------------|-------------|
| her         | 2012–2014   | 0.042 0.041–0.043 |
|             | 2014–2016   | 0.082 0.079–0.084 |
|             | 2015–2016   | 0.015 0.013–0.017 |
| CDM (claims)| 2014–2016   | 0.048 0.045–0.052 |

**Disclosures.** All authors: Employee and Shareholder, Salary.

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1439. The Cost-Effectiveness of Vaccinating Adults at Increased Risk of Pneumococcal Disease Against Pneumococcal Disease in The Netherlands

Mark Rozenbaum, PhD; MBA; Pfizer: Employee, Shareholder.

**Session:** 146. Pneumococcal Vaccines

**Background.** There is currently no data on the age- and risk-group-specific cost-effectiveness of the 13-valent pneumococcal vaccine (PCV13) compared with the 23-valent polysaccharide vaccine (PPV23). The aim of this study was to evaluate the cost-effectiveness of vaccinating these specific groups against pneumococcal disease.

**Methods.** A previously published and independently validated (by The Dutch National Health-Care Institute) age- and risk-group-specific Markov-type model was used to compare the cost-effectiveness of PCV13 vaccination vs. PPV23 vaccination of all adults at increased risk of pneumococcal disease (i.e., adults with underlying disease and those ≥65 years). Efficacy estimates for PCV13 were extrapolated from the Community-Acquired Pneumonia Immunization Trial in Adults (CAPITA). Efficacy estimates for PPV23 were based on systematic literature reviews and other published data.

**Results.** At list price ($68.56 for PCV13 and $19.99 for PPV23), vaccination of all adults at increased risk of pneumococcal disease resulted in an ICER of $20,186/QALY, while vaccinating those with chronic medical conditions (moderate risk) and immunocompromising conditions (high risk) resulted in an ICER of <$10,000/QALY. Large differences in ICERS between age- and risk-groups were observed (Table). Vaccinating high-risk individuals with PCV13 was cost-saving for those aged less than 65 years of age compared with PPV23 while vaccinating those aged 85 years and older with PCV13 was cost-effective with an ICER of $60,900/QALY. Vaccinating moderate risk individuals was highly cost-effective (<$20,000/QALY), while vaccinating those with low-risk of pneumococcal infection was cost-effective (<$50,000/QALY). However, within risk groups the ICER differed significantly between age groups. Sensitivity analysis showed that a proportional decrease in list price, such as common in national vaccination programs, decreased the ICER disproportionately in favor of PCV13.

**Conclusion.** Vaccination all adults with PCV13 is cost effective compared with PPV23. There is a large variation in the cost-effectiveness between age and risk groups. Targeting individuals with underlying diseases aged less than 85 years would provide most value for money.

**Disclosures.** M. Rozenbaum, Pfizer: Employee and Shareholder, Salary.

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1440. Potential Impact of Routine Use of 13-Valent Pneumococcal Conjugate Vaccine on Hospitalizations for Pneumonia among Older Adults in Canada

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**Session:** 146. Pneumococcal Vaccines

**Background.** In Canada, 13-valent pneumococcal conjugate vaccine (PCV13) was licensed for the prevention of vaccine-type (VT) pneumonia in adults in July 2015. Herd effects stemming from the routine pediatric PCV13 program have historically led to reductions in VT disease in older adults, and there is currently no recommendation for a routine age-based PCV13 program for this age group. However, recent data suggest these indirect effects may have plateaued, leaving a persistent and substantial burden of potentially preventable pneumococcal disease in older adults. We evaluated the potential impact of PCV13 immunization program for Canadian adults aged ≥65 years on hospitalizations for community-acquired pneumonia (CAP).

**Methods.** We constructed a mathematical model based on Canada-specific burden of disease estimates and published estimates of PCV13 effectiveness and durability. We estimated the number of hospitalizations averted as the product of (i) the size of the Canadian population aged ≥65 years, (ii) the incidence of all-case CAP, (iii) the proportion of CAP that is VT, (iv) PCV13 effectiveness, and (v) the duration of protection for PCV13 over a 5-year time horizon. We assumed that rates of all-case CAP; the proportion of VT CAP; and PCV13 effectiveness remained constant over the 5-year assessment period. We assumed a 5% annual all-cause mortality rate in the overall population. We estimated hospital days averted as the product of hospitalizations averted and median length of stay. Model assumptions are summarized in Table 1.

**Results.** Based on model assumptions, PCV13 use in Canadian adults aged ≥65 years would lead to an annual rate reduction of 62 (11–77) hospitalizations per 100,000 persons, per year. This reduction, applied to the entire Canadian population of older adults, would avert an estimated 17,274 (3,037–21,711) hospitalizations and 138,192 (24,298–173,690) hospital days over a 5-year period.

**Conclusion.** Despite herd effects from the routine pediatric program, direct PCV13 immunization of older adults in Canada could result in considerable additional reduction in hospitalizations for pneumonia.

**Table 1. Model Assumptions**

| Parameter | Value | Source |
|-----------|-------|--------|
| Population size | 6,195,500 | Statistics Canada |
| Annual all-case CAP incidence | 1,692 per 100,000 | Canadian Institute of Health Information Discharge Abstract Database (2015) |
| Percentage of all-case CAP caused by PCV13 serotypes | 5% | LeBlanc et al. Vaccine. 2017, 35(29):3647-3654 |
| PCV13 effectiveness against hospitalization for VT CAP | 72.6% (12.8–91.5%) | McLaughlin et al. Clin Infect Dis. 2018, in press |
| Duration of PCV13 effectiveness | 5 years (ie, no waning) | Patterson et al. Triviol Vaccinol. 2016:5:92-96 |
| Median length of hospital stay (pneumococcal CAP) | 8 days | LeBlanc et al. Vaccine. 2017, 35(29):3647-3654 |

**Disclosures.** J. Vojicic, S. Dion, R. E. Isturiz, C. Laferrerie, M. Major, R. M. Nepal, and J. A. Suaya: Pfizer: Employee and Shareholder, Benefits and stock and Salary, J. M. McLaughlin, Pfizer: Employee, Salary.

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1441. Doses of 13-Valent Conjugated Pneumococcal Vaccine (PCV13) for Patients With Multiple Myeloma (MM)

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**Session:** 146. Pneumococcal Vaccines

**Background.** Patients with MM are vulnerable to bacterial infection, especially invasive pneumococcal diseases. Vaccination with one-dose PCV13 is recommended, but their poor immunogenicity was observed. We aimed to assess whether two-dose PCV13 might help.

**Methods.** Patients with MM were randomized to receive one- or two-dose PCV13. The two doses were given 1 month apart. Measurements of antibody to the