broadened 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-stratified 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 the 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). Broadened serotype coverage leads to greater reductions in IPD. The greatest IPD reduction occurs in infant vaccine-naïve individuals, but even similar reductions are also observed in the unvaccinated elderly population due to herd protection.

| Additional Vaccine Coverage Over PCV13 (2017/2024) | IPD Incidence Rate Reduction (%) (2,024 vs. 2,034) |
|-----------------------------------------------|-----------------------------------------------|
| <2 Years 2–5 Years 50–64 Years ≥65 Years All Ages | <2 Years 2–5 Years 50–64 Years ≥65 Years All Ages |
| 11–21% | 22–35% | 36 | 35 | 33 | 31 | 31 |
| 15–30% | 42 | 42 | 41 | 39 | 40 |

*Defined as the proportion of IPD cases that are caused by serotypes covered by the new PCV in 2016/2018 (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.

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

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Background. Among children, upper respiratory tract infections (UTIs) are the most frequent reason for antibiotic use and contribute to the antimicrobial resistance (AMR) crisis. The implementation of pneumococcal conjugate vaccines (PCV) in Canada is expected to substantially reduce 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 immunization 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.

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

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Background. Invasive pneumococcal disease identified in the post-PCV13 era is primarily caused by NVSTs, specifically serotypes 15C, 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 NVSTs.

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

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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, as reported through the Massachusetts Department of Public Health 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 25 years. Incidence of IPD declined to 6.81/10,000 children (95% CI 2.6-11.1) in 2015/2016 period which represents a 72.1% decline compared with 2010/2011 (24.41/10,000, 95% CI 16.3–32.5) (figure). However, in 2016/2017, IPD incidence increased to 10.41/10,000 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 over all mortality rate was 5.1%. Isolates from 308 (89.3%) were available for serotyping; 105 (34.3%) children had serotypes (VST) were identified (18.3% (46.2%), 7F (19.9%), 3 (17.9%), 19F (10.4%), 6A (2.8%), 14, 18C, 5 (9.0% each). Serotypes 15B (13.7%), 22F (12.6%) and 33F (11.8%) were the most common nonvaccine serotypes (NVST).