Research Grant or Support; IHMA (Individual(s) Involved: Self): Research Grant or Support; Janssen Research & Development (Individual(s) Involved: Self): Research Grant or Support; Johnson & Johnson (Individual(s) Involved: Self): Research Grant or Support; Kaleido Biosceinces (Individual(s) Involved: Self): Research Grant or Support; KBP Biosciences (Individual(s) Involved: Self): Research Grant or Support; Luminex (Individual(s) Involved: Self): Research Grant or Support; Matrivax (Individual(s) Involved: Self): Research Grant or Support; Mayo Clinic (Individual(s) Involved: Self): Research Grant or Support; Medpace (Individual(s) Involved: Self): Research Grant or Support; Meiji Seika Pharma Co., Ltd. (Individual(s) Involved: Self): Research Grant or Support; Melinta (Individual(s) Involved: Self): Research Grant or Support; Menarini (Individual(s) Involved: Self): Research Grant or Support; Merck (Individual(s) Involved: Self): Research Grant or Support; Meridian Bioscience Inc. (Individual(s) Involved: Self): Research Grant or Support; Micromyx (Individual(s) Involved: Self): Research Grant or Support; MicuRx (Individual(s) Involved: Self): Research Grant or Support; N8 Medical (Individual(s) Involved: Self): Research Grant or Support; Nabriva (Individual(s) Involved: Self): Research Grant or Support; National Institutes of Health (Individual(s) Involved: Self): Research Grant or Support; National University of Singapore (Individual(s) Involved: Self): Research Grant or Support; North Bristol NHS Trust (Individual(s) Involved: Self): Research Grant or Support; Novome Biotechnologies (Individual(s) Involved: Self): Research Grant or Support; Paratek (Individual(s) Involved: Self): Research Grant or Support; Pfizer (Individual(s) Involved: Self): Research Grant or Support; Prokaryotics Inc. (Individual(s) Involved: Self): Research Grant or Support; QPEX Biopharma (Individual(s) Involved: Self): Research Grant or Support; Rhode Island Hospital (Individual(s) Involved: Self): Research Grant or Support; RIHML (Individual(s) Involved: Self): Research Grant or Support; Roche (Individual(s) Involved: Self): Research Grant or Support; Roivant (Individual(s) Involved: Self): Research Grant or Support; Salvat (Individual(s) Involved: Self): Research Grant or Support; Scynexis (Individual(s) Involved: Self): Research Grant or Support; SeLux Diagnostics (Individual(s) Involved: Self): Research Grant or Support; Shionogi (Individual(s) Involved: Self): Research Grant or Support; Specific Diagnostics (Individual(s) Involved: Self): Research Grant or Support; Spero (Individual(s) Involved: Self): Research Grant or Support; SuperTrans Medical LT (Individual(s) Involved: Self): Research Grant or Support; T2 Biosystems (Individual(s) Involved: Self): Research Grant or Support; The University of Queensland (Individual(s) Involved: Self): Research Grant or Support; Thermo Fisher Scientific (Individual(s) Involved: Self): Research Grant or Support; Tufts Medical Center (Individual(s) Involved: Self): Research Grant or Support; Universite de Sherbrooke (Individual(s) Involved: Self): Research Grant or Support; University of Iowa (Individual(s) Involved: Self): Research Grant or Support; University of Iowa Hospitals and Clinics (Individual(s) Involved: Self): Research Grant or Support; University of Wisconsin (Individual(s) Involved: Self): Research Grant or Support; UNT System College of Pharmacy (Individual(s) Involved: Self): Research Grant or Support; URMC (Individual(s) Involved: Self): Research Grant or Support; UT Southwestern (Individual(s) Involved: Self): Research Grant or Support; VenatoRx (Individual(s) Involved: Self): Research Grant or Support; Viosera Therapeutics (Individual(s) Involved: Self): Research Grant or Support; Wayne State University (Individual(s) Involved: Self): Research Grant or Support

1309. Incidence and Epidemiology of Invasive Pneumococcal Disease due to Serotype 3 in South-Central Ontario

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Toronto Invasive Bacterial Diseases Network

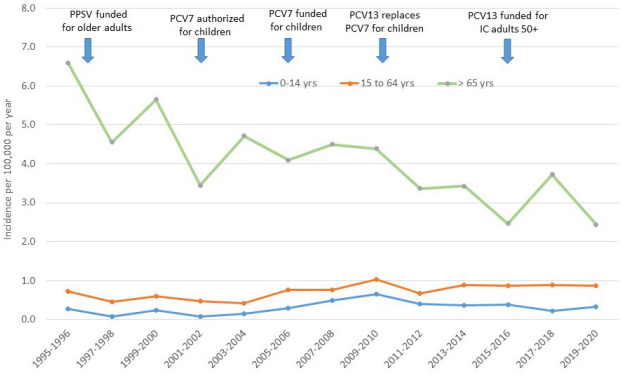
Session: P-73. Respiratory Infections - Bacterial

Background. In our population, the most common serotype (ST) of *S. pneumoniae* causing invasive pneumococcal disease (IPD) is now ST 3. We undertook an analysis of population based surveillance for IPD to examine the incidence and epidemiology of ST 3 disease over the last 25 years.

Methods. The Toronto Invasive Bacterial Diseases Network has performed population-based surveillance for IPD in Toronto/Peel region (pop'n 4.5M) since 1995. All sterile site isolates of *S. pneumoniae* are reported to a central study laboratory, isolates are serotyped, and clinical and vaccination data are collected via patient and physician interview and chart review. Population data are obtained from Statistics Canada.

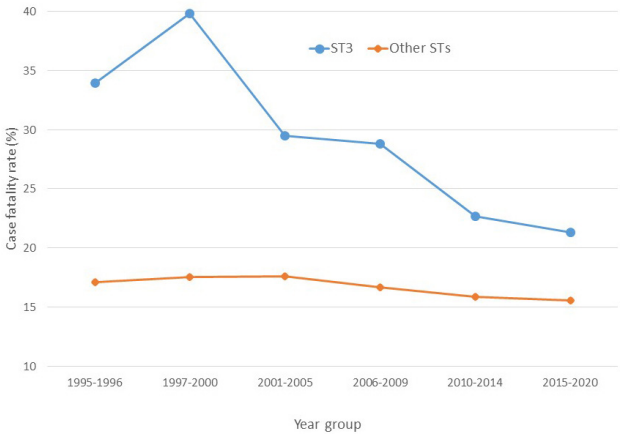
Results. From 1995-2020, 11032 episodes of IPD occurred; 10015 had STs available, and 10484 clinical data. Overall, ST 3 comprised 9.2% of cases (N=931). Compared to other patients with IPD, those with ST 3 IPD were older (median age 65 vs. 58.5, P< .001), more likely to have underlying lung (22.7% v 16.0%, P< .0001) and cardiac (21.7 v 18.4, P=.02) disease and less likely to be immunocompromised (IC) (23.1% v 29.0% P< .0001). ST3 episodes were more likely to be pneumonia (81% v 65%), less likely to be bacteremia without focus (7.6% v 18.9%), and more likely to require ICU admission (42.3% v 25.1%) and to die (27.1% v 16.6%). In multivariable analysis, patients with ST 3 disease remained more likely to die (OR 1.65; 95%CI1.3-2.0). Over time, the proportion of patients with ST 3 IPD who were nursing home (NH) residents (18/171 in 1995-2000 vs. 4/215 in 2016-2020, P=.0002), and who were IC (46/169 in 1995-2000 vs 39/204 in 2016-2020, P=.007) decreased significantly; in IPD due to other STs, the proportion who were NH residents declined, but the proportion IC increased significantly. The case fatality rate (CFR) declined significantly in IPD due to ST3 but not other STs (Figure 1). Changes in incidence are shown in Figure 2.

Figure 2: Incidence of serotype 3 IPD over time, Toronto/Peel, 1995-2020



The incidence of ST3 IPD in children and adults under 65 did not change significantly from 1995/96 to 2019/20. In older adults, the annual incidence of disease declined from 4.98 per 100,000 per year in 1995-2000 to 3.53 per 100,000 per year in 2001-2010 (IRR 0.71, 95%CI 0.56-0.90), then to 2.23 per 100,000 per year in 2011-2020 (IRR compared to 2001-2010 0.63, 95%CI 0.50-0.79)

FIgure 2: Case fatality rate of IPD due to serotype 3 and other serotypes over time, 1995-2020, Toronto-Peel



The case fatality rate of IPD due to ST3 declined from 37.6% (56/149) in 1995-2000 to 50/235 (21.3%) in 2015-2020 (P<.0001). The CFR in other serotypes did not change.

Conclusion. The epidemiology of IPD due to ST3 has changed significantly over time and the CFR has declined. The incidence of ST3 disease in children and younger adults has not changed significantly, although the power to detect change is low in children. In older adults the incidence of ST3 disease declined significantly after PPV23 introduction in 1995/6 and again after PCV13 introduction for children.

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1310. Provider and Facility Variation in Empiric Broad-Spectrum Antibiotic Use for Hospitalization Pneumonia: A Mixed Methods Study of Veterans Affairs Facilities

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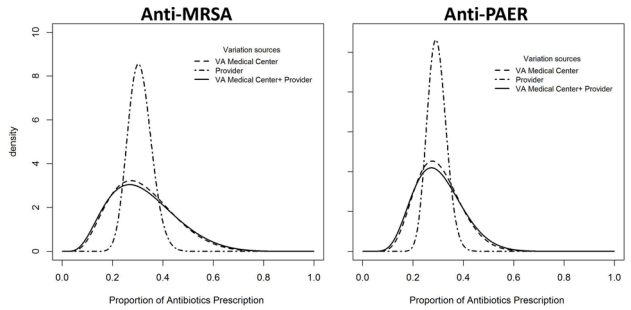
Session: P-73. Respiratory Infections - Bacterial

Background. We previously found widespread variation in the empiric use of antibiotics against methicillin-resistant *Staph aureus* (anti-MRSA) and *Pseudomonas aeruginosa* (anti-PAER) for patients hospitalized for pneumonia. To explore this

variation further, we conducted (1) quantitative analyses of facility-level versus provider-level variation, and (2) qualitative interviews with emergency department providers.

Figure 1. Variation in empiric use of a) Anti-MRSA and b) anti-PAER among 215,803 Veterans hospitalized for pneumonia across 117 VA medical centers, 2006-2016. Variation was nearly completely explained by facility-level variation for both antibiotic decisions.



Methods. For each hospitalization, we predicted the probability of anti-MRSA and anti-PAER use by fitting machine learning models from 75 patient variables. We estimated the predicted risk of anti-MRSA/anti-PAER and facility features among patients hospitalized at upper versus lower 10% facilities after controlling for patient characteristics. We plotted density curves with the variance attributed to facility and provider alone and together. We then interviewed 16 emergency department (ED) providers at 8 VA facilities using a cognitive task analysis.

Results. Among 215,803 hospitalizations at 128 VA facilities 1/1/2006-12/31/2016, 31% received empiric anti-MRSA and 29% received empiric anti-PAER antibiotics. Hospitalizations at upper-decile facilities had a 50% and 45% adjusted probability of receiving anti-MRSA and anti-PAER antibiotics, compared to 15% and 20% in the lower-decile facilities. Facility features most predictive of anti-MRSA or anti-PAER use after adjusting for patient characteristics were complexity level (33% and 30% in high versus 15% and 20% in low complexity facilities). Variation in empiric anti-MRSA and anti-PAER use was almost completely at the facility level (**Figure 1**). Providers reported social influences from the opinions of other providers during decision-making and a high trust in guidelines and order sets. Consideration of pathogens was not mentioned by any providers at high-prescribing facilities.

Conclusion. Variation in empiric use of anti-MRSA and anti-PAER antibiotics in pneumonia clustered nearly completely at the facility level. ED providers report social influences during decision-making and a high trust in guidelines and order sets. Guidelines, order sets, and facility-level clinical champions that promote consideration of pathogens could be important strategies for de-adoption.

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

1311. Population-based Mortality Rates of Clinical Syndromes Potentially Associated with Pneumococcal Disease in Argentina from 2008-2018

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Session: P-73. Respiratory Infections - Bacterial

Background. In 2012, the 13-valent conjugate vaccine (PCV13) for children < 2 years was introduced in the Argentinean National Immunization Program (NIP) with sustained coverage >80% since then. The 23-valent polysaccharide vaccine (PPSV23) has been available for ≥65 years and at-risk populations in NIP since 2001 and in 2017, it was replaced by the sequential regimen(PCV13/PPSV23). The 2013 National Survey of Risk Factors estimated a coverage of 23.1% for ≥65 years and 16.2% for at-risk populations. We evaluated mortality rates of clinical syndromes potentially associated with pneumococcal disease (PPD)in a 10-year period by age groups, before (2008-2011) and after childhood PCV introduction (2013-2018) in the NIP in Argentina.

Methods. All-age death cases related to clinical syndromes PPD were obtained from Dirección de Estadísticas e Información de la Salud between 2008-2018. ICD-10 codes were used to define PPD: pneumonia (J13-J18) and invasive disease (sepsis – A.40.*, A41.*, A49.*; meningitis – G00.*, G03.9; and other - M00.1, J86.*, J90-J91, B95.3). The yearly mortality rate was calculated per 100,000 people, estimated by the national census, and stratified by age groups. The percentage of change was the difference between the average rate in the pre (2008-2011) and post-vaccination (2013-2018) periods.

Results. In total, 65,947 deaths due to pneumonia (56.7%) and invasive disease (43.3%) occurred from 2008 and 2018. In the younger age groups (< 1, 1-4, 5-17), a 44% reduction was seen in both invasive disease and pneumonia compared to pre-childhood vaccination period, mainly in infants (from 22.2 to 10.2 per 100,000 people). In adult population, a less pronounced reduction was noted in mortality by invasive disease, however an inverse trend occurred in pneumonia in the age groups 18-49 years, 50-59 years, and 60-69 years, from 1.9 to 2.1 (7%), 9.3 to 10.2 (10%) and 18.3 to 19.2 (5%) per 100,00 people, respectively (Fig 1).

Mortality rate change (%) pre and post- pneumococcal childhood introduction

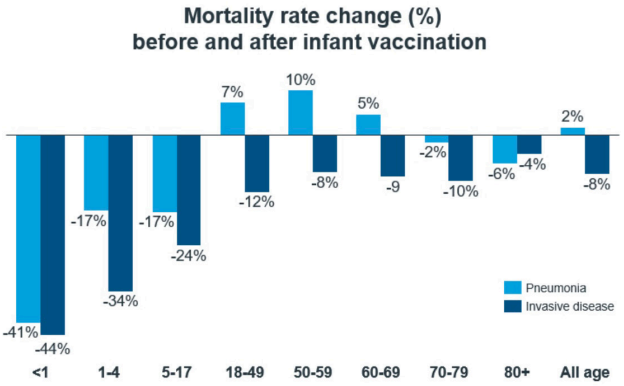

Figure 1. Mortality rate change (%) of clinical syndromes potentially associated with pneumococcal disease before (2008-2011) and after infant vaccination introduction (2013-2018) in Argentina.

Conclusion. Mortality rates declined mostly for infants, and despite the differences observed for the older population, it remains significant. Evaluation of mortality trends are key for decision-making process on current and future prevention strategies using pneumococcal vaccines.

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1312. Evaluation of a Multiplexed PCR Pneumonia Panel in a Tertiary Care Medical Center

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Session: P-73. Respiratory Infections - Bacterial

Background. Syndromic PCR testing for lower respiratory pathogens may give rapid, actionable results to aid in management decisions for suspected pneumonia cases. We sought to evaluate the performance of a multiplexed PCR pneumonia panel compared to routine microbiologic work-up in a tertiary care patient population.

Methods. Sputum and bronchoalveolar lavage (BAL) samples from Keck Medical Center (Los Angeles, CA) inpatients submitted for clinical microbiology work-up Dec 2019-Jun 2020 were tested by a multiplexed PCR panel (FilmArray Pneumonia Panel, BioFire Diagnostics). We compared panel results for typical bacterial pathogens to those of quantitative culture and susceptibility testing. We retrospectively determined the incidence of non-panel respiratory pathogens as detected by standard of care tests in this patient cohort.

Results. 68 of 180 samples yielded 80 positive bacterial PCR results: 34 were detected by both PCR panel and culture and 46 by PCR panel only, yielding a sensitivity of 100% (34/34) for pathogens detected and specificity of 73.1% (114/156) among negative cultures (normal flora or no growth). Concordant results had PCR Bin values ≥10^5 copies/mL whereas all 18 targets detected at 10^4 copies/mL were culture-negative. Among resistance gene targets, the panel detected 12 MRSA specimens, of which MRSA grew in only 4 cultures; E. coli and CTX-M in 1 specimen from which grew normal flora; and multiple gram-negative organisms and KPC in 1 specimen from which culture isolated carbapenem-resistant P. aeruginosa. Quantitation from positive BAL cultures (n=25) correlated weakly with PCR Bin values (R-squared=0.17). Non-PCR panel pathogens were detected in 22 of 180 (12.2%) specimens through routine methods (16 molds, 3 AFB, and 3 non-fermenter gram-negative bacteria).

Conclusion. The pneumonia panel had excellent sensitivity for its target bacterial pathogens, but results were often positive in negative cultures. This could be due to antecedent antibiotic therapy, differences in reporting threshold versus culture, or inability of PCR to discern results from normal flora. Non-panel pathogens were detected in a significant proportion in our population. The pneumonia panel should be implemented and interpreted carefully with consideration of antimicrobial stewardship.

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1313. Disease Burden and Real-world Clinical Practice for the Treatment of Hospital-Acquired Bacterial Pneumonia Using a Japanese Large-scale Claims Database: A Retrospective Cohort Study

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Session: P-73. Respiratory Infections - Bacterial

Background. With an aging population and increasing healthcare utilization, the frequency of hospital-acquired pneumonia (HAP) is expected to increase. Since