Background:
Up to 75% of the cases of invasive pneumococcal disease (IPD) in adults are caused by serotypes included in the pediatric conjugate vaccine (PCV13). PCV13 is currently recommended for use in children aged ≤5 years. The impacts of PCV13 on the rates of IPD in adults and the serotypes causing IPD in adults are unknown. An observational study of IPD caused by PCV13 serotypes in adults since HCPCV13 eligibility was introduced in Canada in June 2010 was performed at seven national reference laboratories (London, Toronto, Vancouver, Calgary, Edmonton, Winnipeg, and Ottawa). The study was approved by the REB at the University Health Network, Toronto, and ethics review boards at participating centers.

Methods:
Adults ≥18 years hospitalized with IPD were included. IPD cases were included if they were cultured or PCR positive and the causative S. pneumoniae strain was identified by serotype. S. pneumoniae was typed by latex agglutination using Treponemal Antibody Nucleic Acid Test (TAST) panels (Oxford Immunotec, USA). Serotype-specific case counts was calculated for each of the 13 previously licensed PCV13 serotypes, 6A, 6B, 9V, 14, 18C, 19A, 19F, 20N, 3, 4, 5, 7F, and 11A. Serotype distribution was compared between the periods of June 1, 2010, to December 31, 2014, and 1996-2004.

Results:
From 2000/01 to 2010/11, adult IPD due to PCV7 serotypes decreased significantly in all age groups (Figure 5a). Changes in IPD caused by vaccine-covered serotypes differed among age groups. Between 2000/01 and 2010/11, adult IPD incidence did not change significantly overall; IPD incidence remained relatively stable at 8.0 cases per 100,000 pop'n (Table 1, Figure 1) (overall decrease by 8%, p=0.33). In adults 65-74 yrs, rates increased from 1.4 to 8.0 cases/100,000 pop'n (468%, p=0.006) and from 2.5 to 8.2 cases/100,000 pop'n, respectively (Figure 5b).

Conclusions:
The study concluded that PCV7 serotypes account for 11.6% of the adult IPD cases, and the serotypes causing IPD in adults remain unstable and complex. Overall adult IPD rates have not changed since 2003. Resistance to penicillin and ceftriaxone has increased. There remains a need to carefully monitor emergence of non-PCV serotypes in adults. Future work will include a matched cohort analysis to compare clinical outcomes of PCV7 and non-vaccine serotypes.

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