Canadian Adults 50-64 Years of Age Contribute Substantially to the Cases of Invasive Pneumococcal Disease (IPD) Potentially Preventable by the 13-valent Pneumococcal Conjugate Vaccine

Ana Gabriela Grajales[1], Stephane Dion[1], Maria Major[1], Rajeev M Nepal[1], Jose A. Suaya[2], Alejandro Cane[2], Jelena Vojicic[1]

1. Pfizer Canada ULC; 2. Pfizer Inc. WW Medicines Development & Scientific Affairs, Collegeville, PA

ISPPD, 2020. 12th International Symposium on Pneumococci and Pneumococcal Diseases (on-site meeting postponed due to COVID-19 pandemic)
ISPPD 2020 Digital Library, Abstract #: 1230. E-poster. June 2020

Background and Aim

- In Canada, the 23-valent pneumococcal polysaccharide vaccine (PPSV23) is recommended for routine immunization of adults aged ≥65 years; in contrast, the 13-valent pneumococcal conjugate vaccine (PCV13) is recommended, without public funding, on an individual basis.[1]
- Following the implementation of PCV13 in routine pediatric immunization programs, the proportion of PCV13-type invasive pneumococcal disease (PCV13-type IPD) in adults ≥65 years decreased due to herd effect. Nevertheless, this decrease has been modest.[1,2,]
- Recent sentinel surveillance study from Canada has shown that PCV13-type serotypes account for a significant proportion of IPD and pneumococcal community-acquired pneumonia (pCAP) not only among adults ≥65 years but also adults aged 50-64 years.[3]
- We assessed: 1)the proportion of IPD cases that occurred in Canadian adults aged 50-64 and ≥65 years; 2) the proportion of IPD by age groups of interest caused by PCV13-type serotypes that therefore, could potentially be addressed by enhancing and expanding age-based adult immunization programs with PCV13.

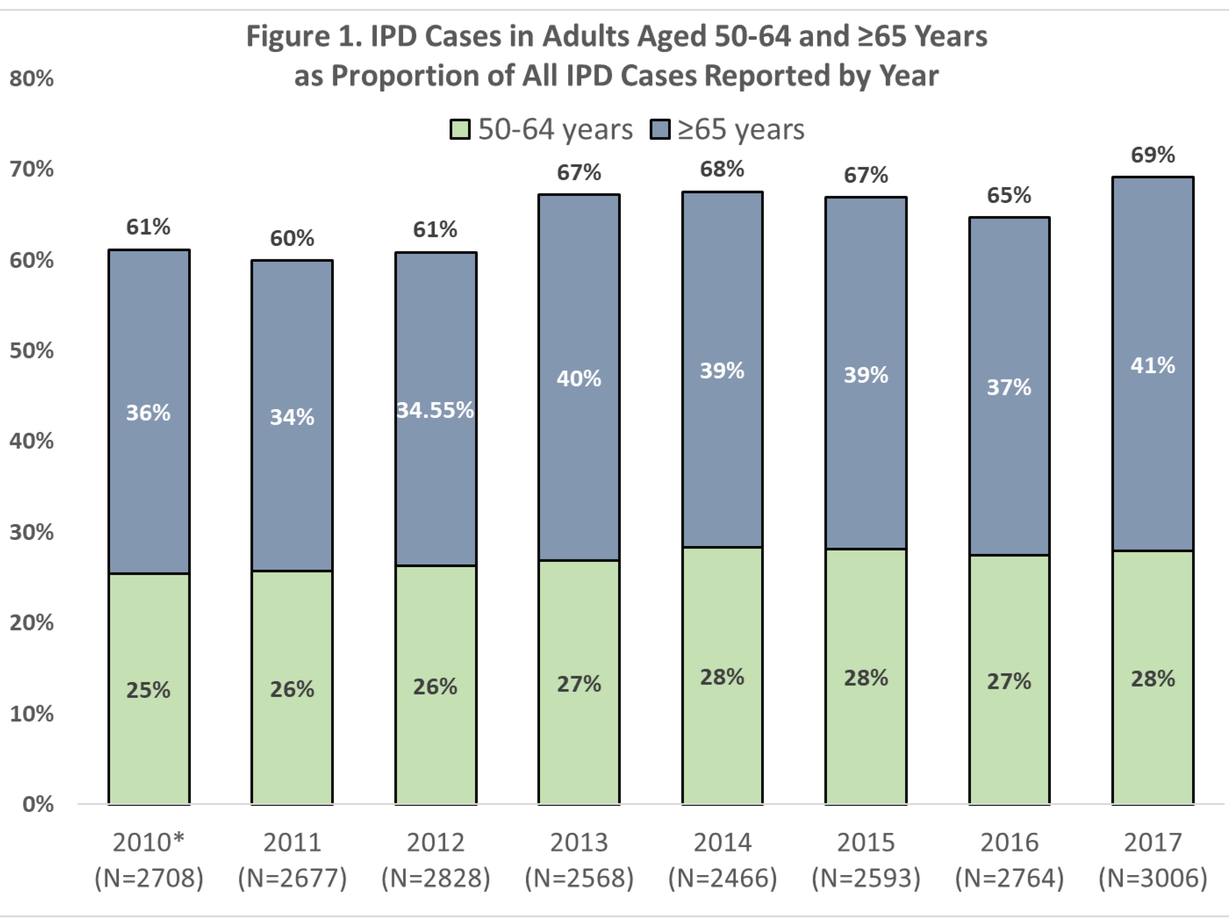
Methods

- Case counts of IPD by serotype and age group were obtained from published annual National Microbiology Laboratory (NML) reports that are based on passive laboratory-based surveillance and available for the period 2010 to 2017.
- NML started surveillance and reference testing of *S. pneumoniae* isolates in April 2010.[4]
- Most recent reports were used when annual case counts differed across reports with overlapping time periods.
- PCV13-type IPD cases were defined as those caused by any of the serotypes contained in the PCV13 formulation.
- For each study year, we calculated:
  1) Proportion of all reported IPD cases occurring in adults aged 50-64 years and ≥65 years.
  2) Proportion of IPD cases in adults aged 50-64 years and ≥65 years that were PCV13-type.

Results

- During the study period, a total of 21,610 IPD cases were reported by the NML in Canada.

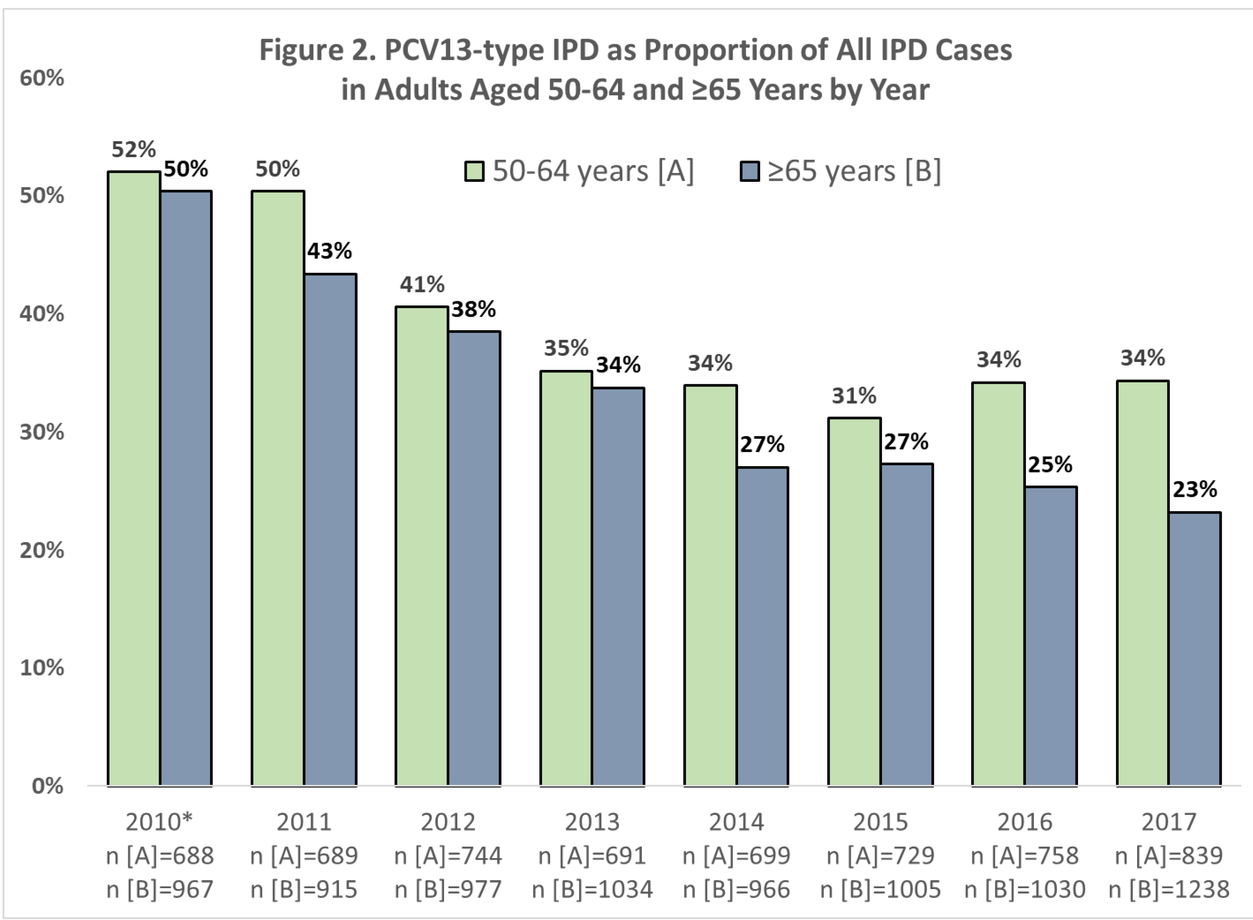
Figure 1. IPD Cases in Adults Aged 50-64 and ≥65 Years as Proportion of All IPD Cases Reported by Year



*2010 is an incomplete year- April –Dec 2010[5]

Results (Cont.)

Figure 2. PCV13-type IPD as Proportion of All IPD Cases in Adults Aged 50-64 and ≥65 Years by Year



*2010 is an incomplete year- April –Dec 2010[5]

- During the study period, adults aged 50-64 and ≥65 years accounted for 25-28% and 34-41%, respectively, of the annual IPD cases reported by NML. (Figure 1)
- The proportion of IPD caused by PCV13-type declined from52% to 34% in those aged 50-64 years and from 50% to 23% in those aged ≥65 years.
- Since 2014 there has been a plateau in the proportion of IPD caused by PCV13-type serotypes in both age groups. (Figure 2)

Discussion/Conclusions

- From 2010 to 2017, there has been a decrease in the proportion of PCV13-type IPD in adults aged 50-64 years and ≥65 years, mainly in the early years after PCV13 pediatric immunization program implementation.
- Lack of further reduction suggest that the herd effect may have been maximized, with ~1/3 to 1/4 of IPD cases (in 50-64 and ≥65 years, respectively) still being caused by PCV13 serotypes in 2017.
- Even more, IPD represents the smaller proportion of pneumococcal disease in adults - the largest proportion (up to 10-fold the IPD incidence) being represented by community acquired pneumonia (CAP).[6]
- Recently published Canadian pCAP data have some similarities with our findings in IPD: 78.0% of pCAP cases in adults ≥16 years occurred in adults aged ≥50 years, 30.8% and 47.1% in adults aged 50-64 years and ≥65 years respectively.[3]
- Similarly, the largest percentage of PCV13-type pCAP cases (74.4%) occurred in adults aged ≥50 years, 33% in adults 50-64 years.[3]
- Our study suggests that apart from adults 65+, those 50-64 years may benefit from enhanced and expanded PCV13 immunization efforts.

References

1. Update on the use of pneumococcal vaccines in adults 65 years of age and older – A Public Health Perspective. An Advisory Committee Statement (ACS) National Advisory Committee on Immunization (NACI). Published: November 2018 https://www.canada.ca/en/public-health/services/publications/healthy-living/update-on-the-use-of-pneumococcal-vaccines-in-adult.html
2. Notifiable diseases on-line. Government if Canada. https://diseases.canada.ca/notifiable/charts?c=cc#c=cc&lang=en_US
3. LeBlanc J, et al. BMJ Open Resp Res 2020;7:e000550. doi:10.1136/bmjresp-2019-000550
4. National Laboratory Surveillance of Invasive Streptococcal Disease in Canada. Annual Summary 2016 https://www.researchgate.net/profile/Walter_Demczuk/publication/324088684_National_Laboratory_Surveillance_of_Invasive_Streptococcal_Disease_in_Canada_Annual_Summary_2016/links/5abcfcc0a6fdcccda657afa9/National-Laboratory-Surveillance-of-Invasive-Streptococcal-Disease-in-Canada-Annual-Summary-2016.pdf?origin=publication_detail
5. Invasive Pneumococcal Disease. For Healthcare professionals. Government of Canada. https://www.canada.ca/en/public-health/services/immunization/vaccine-preventable-diseases/invasivepneumococcal-disease/health-professionals.html
6. Shea KM, et al. Open Forum Infect Dis. 2014 doi: 10.1093/ofid/ofu024

Contact info: anagabriela.grajales@Pfizer.com **Funding Source:** Pfizer Inc. **Conflicts of interest:** AGG, SD, MM, RMN, JAS., AC, JV are Pfizer employees and may own company stocks.