

## BACKGROUND

- Belgium has a unique setting to study the potential **indirect effect of changes in childhood immunization programs on adult IPD**
- After PCV7 introduction in 2007, different PCVs with **high stable vaccine uptake (> 93%)** were used in children (all 2+1 dosing schedule)
  - 2011-2015: first PCV13 period**
  - 2015-2019: PCV10 period**
  - 2019-current: second PCV13 period**
- Low vaccination coverage in adults (<15%)**

## METHODS

- Stable laboratory-based surveillance for IPD in Belgium:** +/- 100 laboratories, spread across country, send isolates to the National Reference Center
- Capsular typing (Quellung reaction) of all IPD cases in adults (>18 years)
- Yearly incidence rates per 100,000 individuals** evaluated over a 10-year period
- We compared **serotype distribution of adult IPD cases from 3 periods, each 3 to 4 years after a switch in the childhood vaccination programme:**
  - 2014-2015 = PCV13-1
  - 2018-2019 = PCV10
  - 2022-2023 = PCV13-2

## RESULTS

### Changes in adult IPD incidence after introduction of PCVs in childhood vaccination programme

- Changes in IPD incidence visualized for children (<18 years), adults (>18 years) and older adults (>65 years) in Figure 1
- After introduction of PCV13 in 2011: decrease in adult IPD incidence** from 16.4 (2011) to 13.3 (2015) per 100,000 adults
- Switch PCV13 to PCV10 in 2015/2016: increase adult IPD incidence** from 12.9 (2016) to 14.9 (2019) per 100,000 adults
- Re-introduction PCV13 in 2019:**
  - COVID-19 pandemic:** drop in IPD cases for all ages to adult incidence of 7.5 cases per 100 000 adults in 2021
  - Return to adult IPD incidence level pre-COVID:** 13.6 (2022) and 16.1 (2023) cases per 100,000 adults
  - Changes most pronounced in older adults (>65 years)** including largest decrease (-56.1%) in IPD incidence during the COVID-19 pandemic

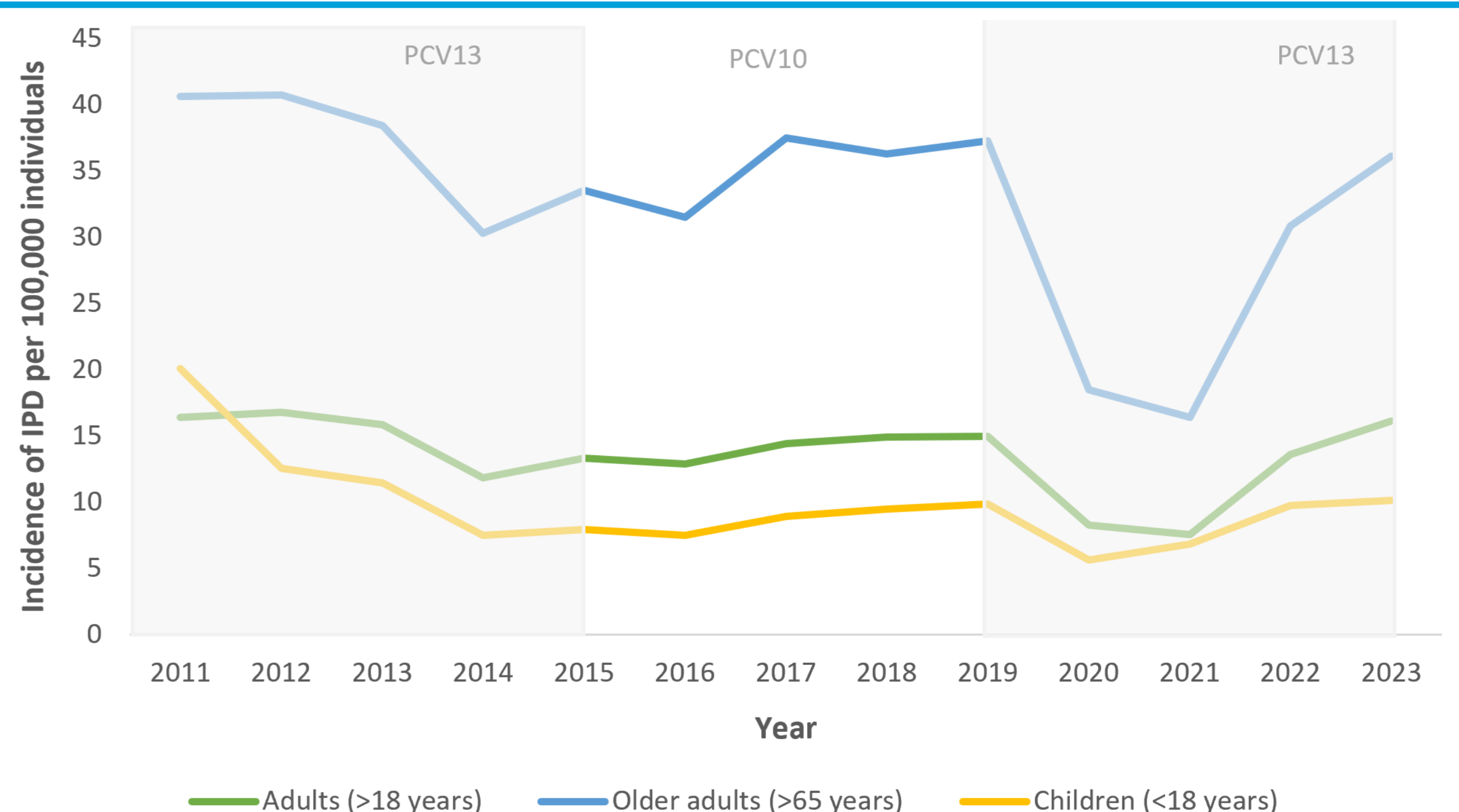
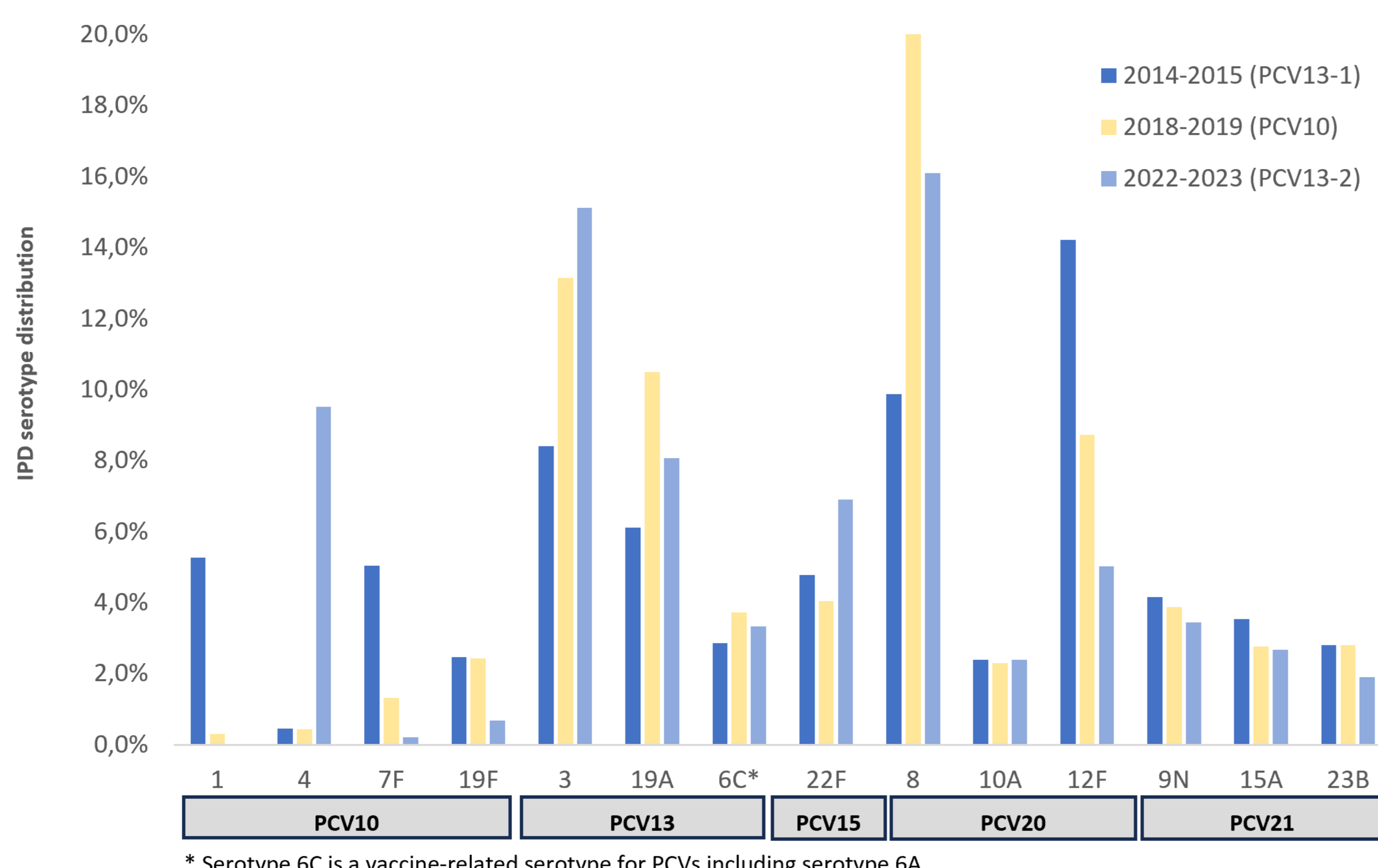


Figure 1: Incidence of IPD (per 100,000 inhabitants) for the period 2011 to 2023: children (<18 years), adults (>18 years) and older adults (>65 years).

### Despite re-introduction of PCV13, proportion of PCV13 (related) serotypes remains high

- Total of 7718 adults IPD cases during the 3 periods
- PCV10 serotypes (Figure 2):**
  - Serotypes 1 and 7F decreased over time:** from 5.3% and 5.0% (PCV13-1) to almost zero detections (PCV13-2)
  - Serotype 19F decreased to 0.7%** (PCV13-2)
  - Serotype 4 increased dramatically in PCV13-2 to 9.5%** <-> 0.4% previous two periods
- PCV13 serotypes:**
  - Serotype 19A proportion highest for PCV10 period:** 10.5% <-> 6.1% (PCV13-1) and 8.1% (PCV13-2)
  - Serotypes 3 increased and 6C remained stable** (6C only increased in the group of older adults (>65 years))
  - Overall proportion: from 33.1% to 34.0% to 39.2%
- Higher valency vaccine serotypes (PCV15/20/21):**
  - Increase of serotypes 22F, while serotypes 10A, 9N, 15A and 23B remained relatively stable
  - Largest decrease for serotype 12F (-9.2%),** while **largest increase for serotype 8 (+6.2%)** over time



\* Serotype 6C is a vaccine-related serotype for PCVs including serotype 6A.

Figure 2: Distribution of IPD serotypes in all adults (>18 years) that are ranked top-10 for at least one of the three time periods (3-4 years after change in type of vaccine in childhood vaccination programme). Serotypes are ordered according to their inclusion in PCVs.

## CONCLUSION

Following childhood PCV implementation, **IPD incidence rates have decreased**, and COVID-19 containment measures had the largest impact on IPD incidence in adults. Different evolutions in PCV13-non-PCV10 serotypes were observed after the switch from PCV13 to PCV10 and back to PCV13. **Serotypes 3 continued to increase, while serotype 19A proportion was highest post PCV10 introduction and serotype 6A and 6C proportions remained stable. Despite PCV10/13 use, PCV13 serotype proportions remained high (>33%) in adults.** Based on 2022-2023 data, the coverage of vaccines PCV20 and PCV21 would be 75% and 81% respectively in adults.

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