Indirect effect of infant PCV10/13 vaccination on IPD in the elderly: pooled analysis from 13 EU sites in 10 EU countries

European Union

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SpIDnet and I-MOVE+ in persons ≥65 years

Aim

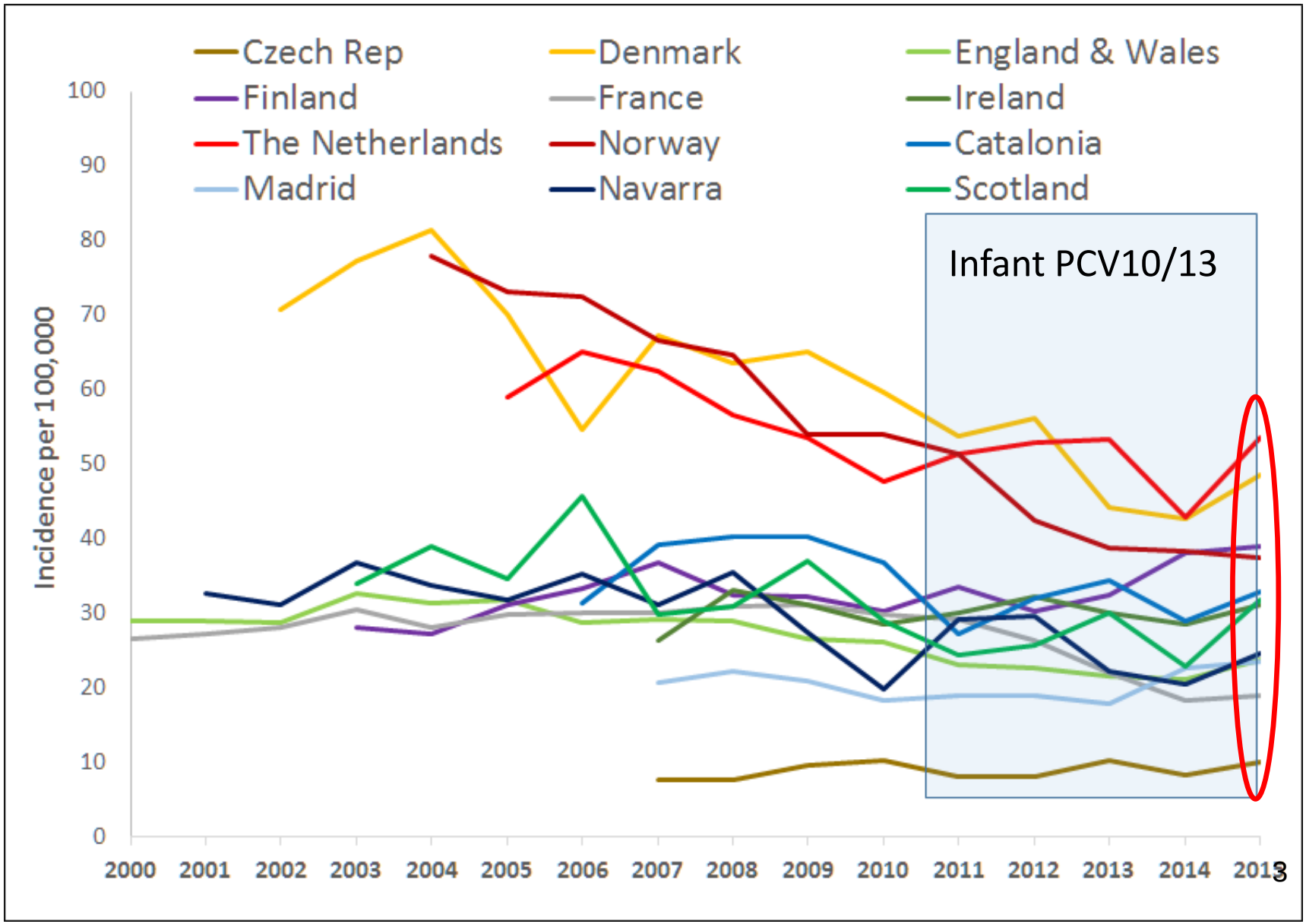
- To assess the indirect effect of infant PCV10/13 on elderly IPD
- To inform decisions on pneumococcal vaccination in the elderly

Method

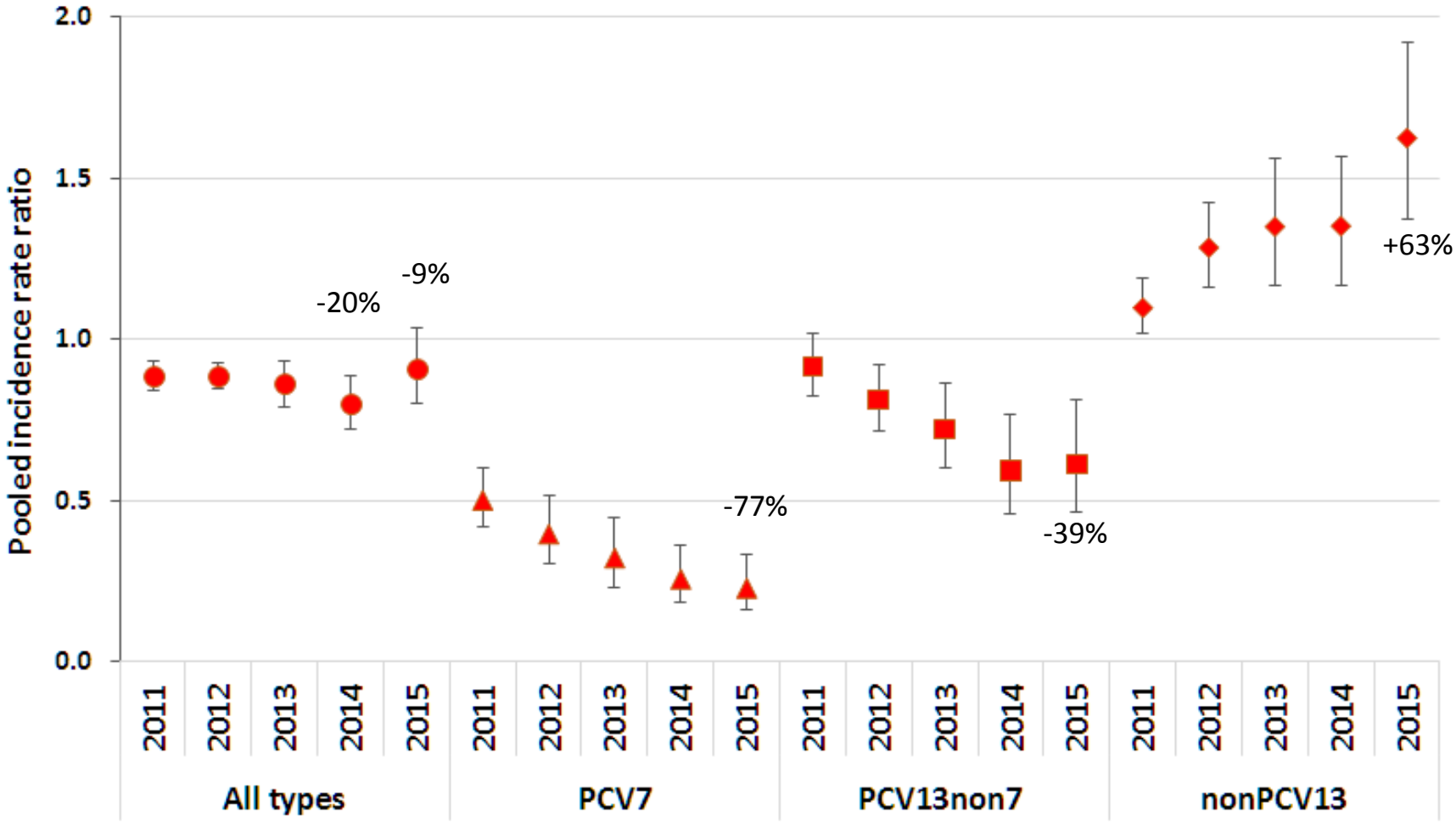
Comparison of PCV10/13 period vs pre-PCV10/13 in 13 sites:

- Incidence rate ratio (IRR) of each PCV10/13 year (2011-15)
  - Compared to pre-PCV10/13 year 2009
- IRR per site, serotype category and year of vaccination, imputing for missing serotypes and surveillance sensitivity
- Meta-analysis of IRR from sites, using random effects
  - Stratified by vaccination policy (PCV10 and PCV13, universal or not)

All type IPD in ≥65 year olds, 2000-15



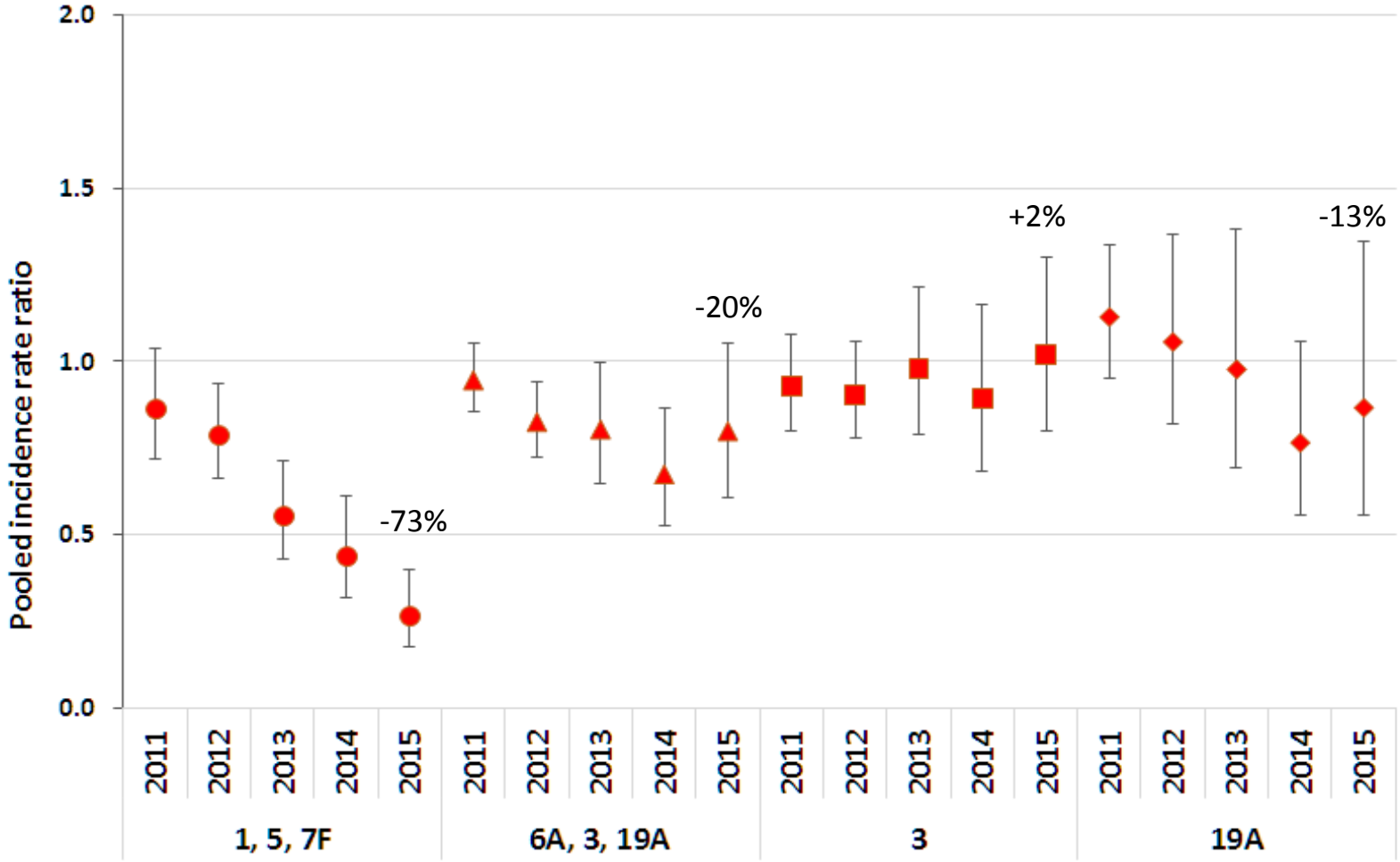
Ratio of IPD incidence in ≥65 year olds PCV10/13 period compared to 2009, 13 sites



PCV10: PCV7 + 1, 5 and 7F PCV13: PCV10 + 3, 6A and 19A

Ratio of IPD incidence in ≥65 year olds PCV10/13 period compared to 2009, 13 sites

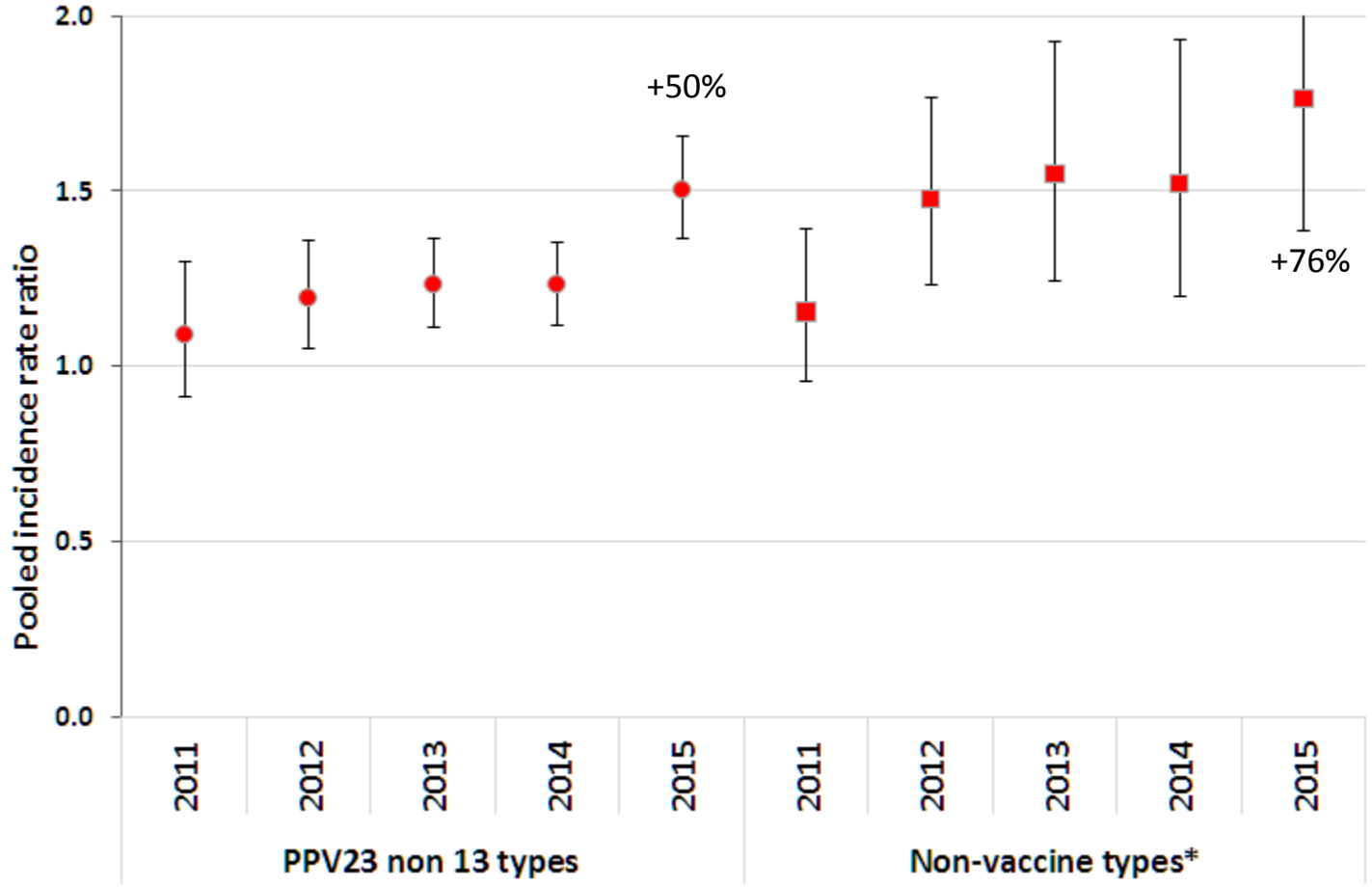
PCV13 types



PCV10: PCV7 + 1, 5 and 7F PCV13: PCV10 + 3, 6A and 19A

Ratio of IPD incidence in ≥65 year olds PCV10/13 period compared to 2009, 13 sites

Non-PCV13 types

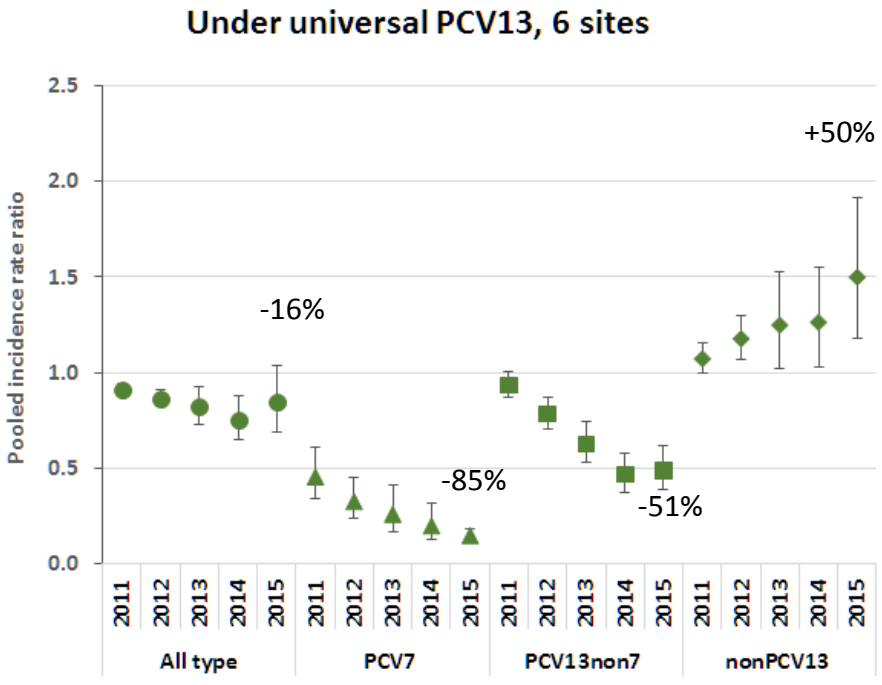


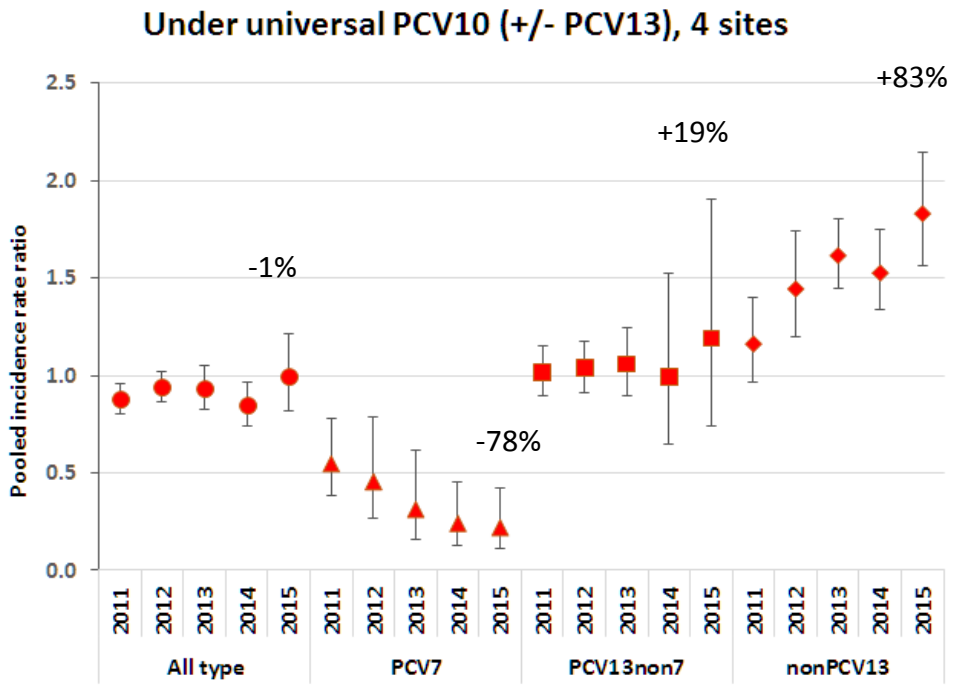
*: serotypes not in PPV23 nor in PCV13

PPV23 non PCV13 (unique) types: increase in every site, from +6% to +289% in 2015

Ratio of IPD incidence in ≥65 year olds PCV10/13 period compared to 2009, 13 sites

By vaccine policy

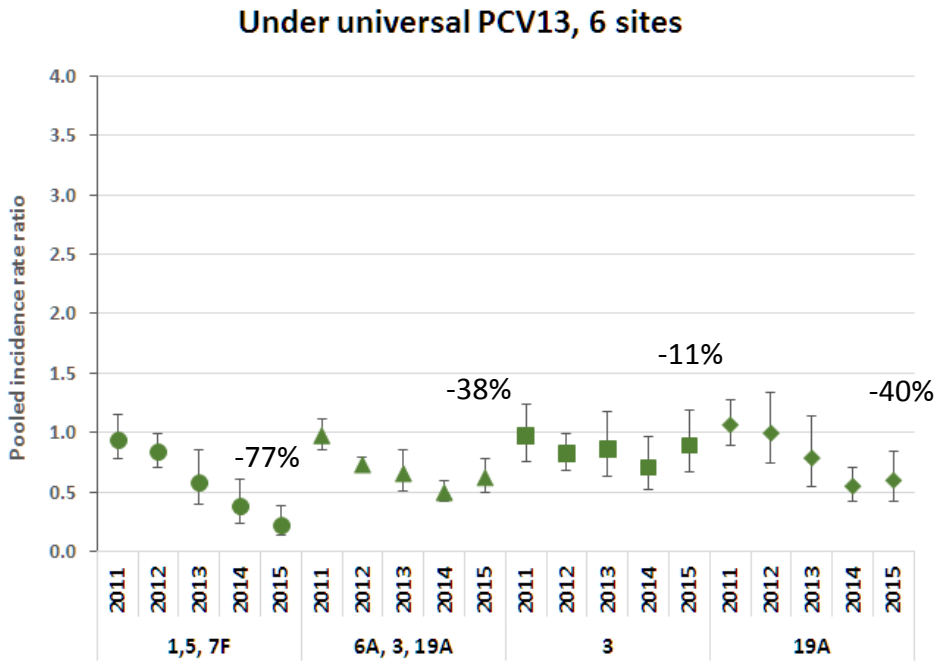


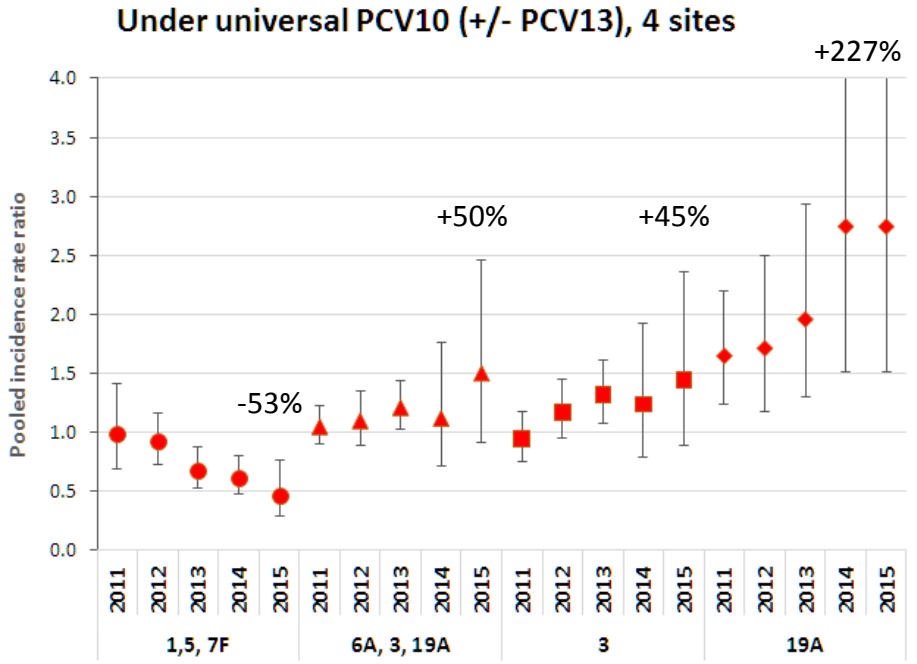


FR, DK, NO, E&W, SC, IE	NL, FI, CZ (PCV10/13), SE (PCV10/13)

Ratio of IPD incidence in ≥65 year olds PCV10/13 period compared to 2009, 13 sites

By vaccine policy, PCV types



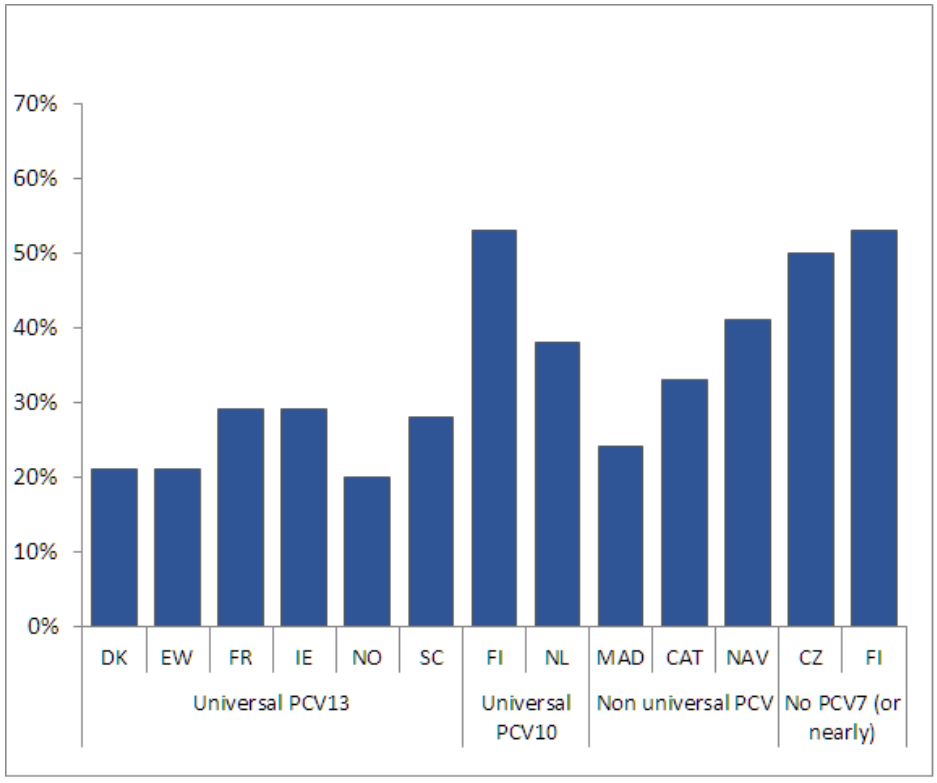


No effect on PCV13non10 serotypes in the 4 sites using PCV10

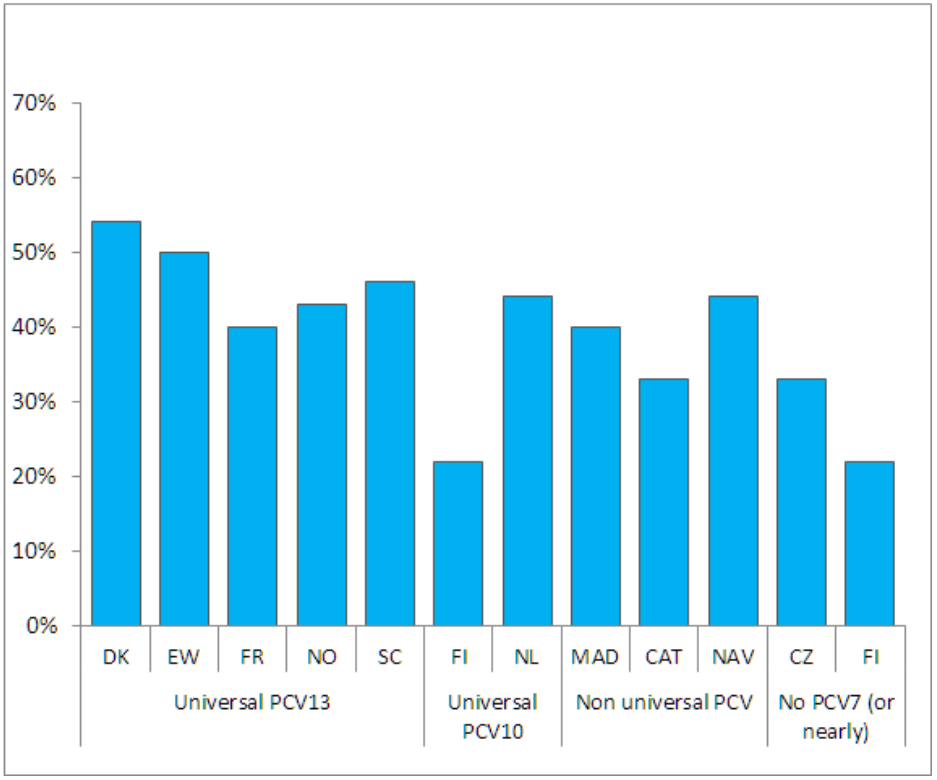
Large 19A increase in each site using PCV10: IRR : range 1.5-5.1 in 2015

PCV13 and PPV23 serotypes in 2015
By site and vaccination policy

PCV13 serotypes



PPV23 serotypes not in PCV13



Discussion

Summary

- Limited net effect of infant PCV10/13 on overall IPD in elderly
  - Reduction in PCV types partly countered by gradual rises in non-PCV13
  - Effect declined in 2015, as incidence rose in every site
- Different effect in PCV13 / PCV10 universal sites
  - PCV10 sites: lower PCV13 decline, due to 19A rises
  - → remaining PCV13 disease and trends vary according to vaccine policy
- Increase in PPV23nonPCV13 serotypes in every site

Assumptions and limitations

- Pre and post-PCV population, epidemiology and surveillance did not change
- Heterogeneity across sites: random effect and stratified analysis
- Only one year of pre-PCV10/13 data

Conclusions and recommendations

- Potential benefit of PCV13 in the elderly reduced by indirect effect of infant vaccination:
  - Remaining PCV13 disease declines rapidly
- Increase in PPV23 unique serotype incidence with time
- Additional benefit of adult PCV13/PPV23 vaccination over the indirect effect of PCV10/13 infant vaccination?

  Differs with infant vaccination policy and history:
  - Lower remaining PCV13 burden and yearly decrease in PCV13 sites vs. no change in PCV10 sites

  → Indirect effect to take into account in decision making
- Needs to further monitor serotype trends
  - Non-PCV13 types in all sites, and 19A in PCV10 countries

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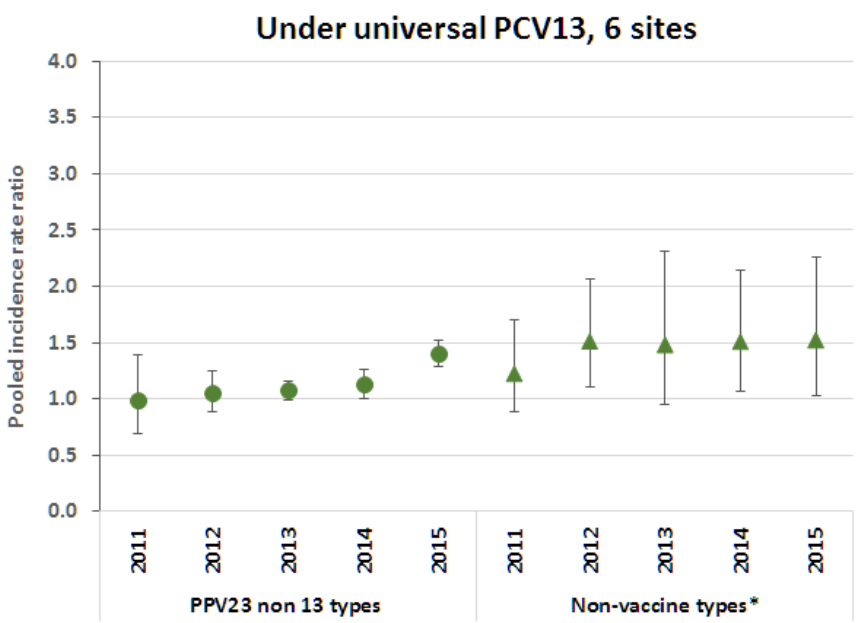
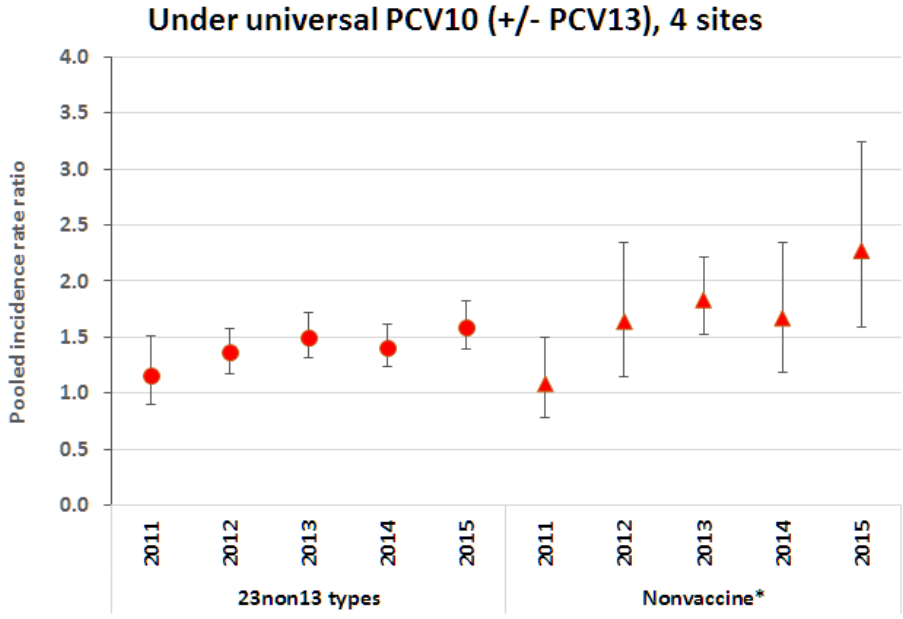
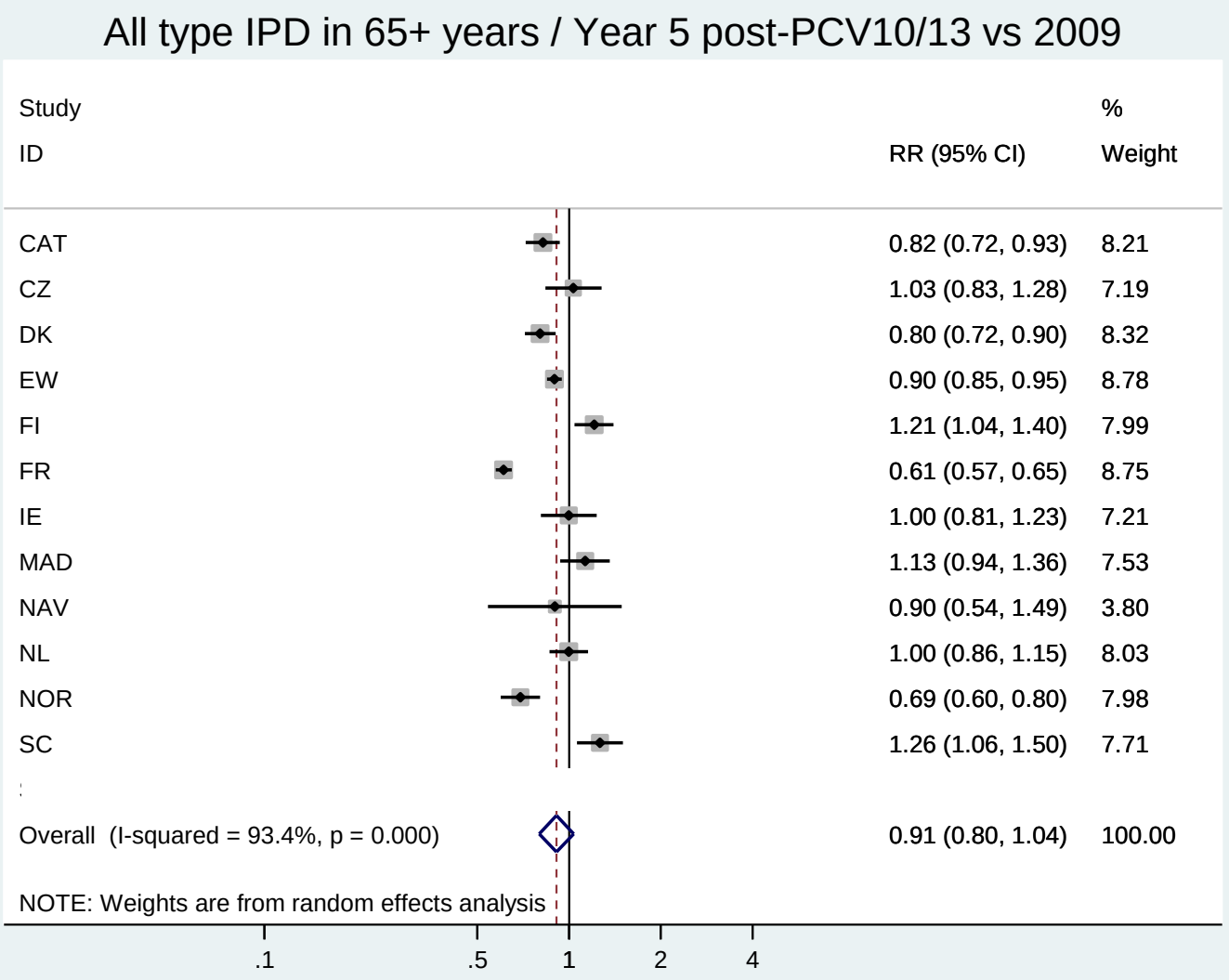
PCV13 and PPV23 serotypes by vaccination policy



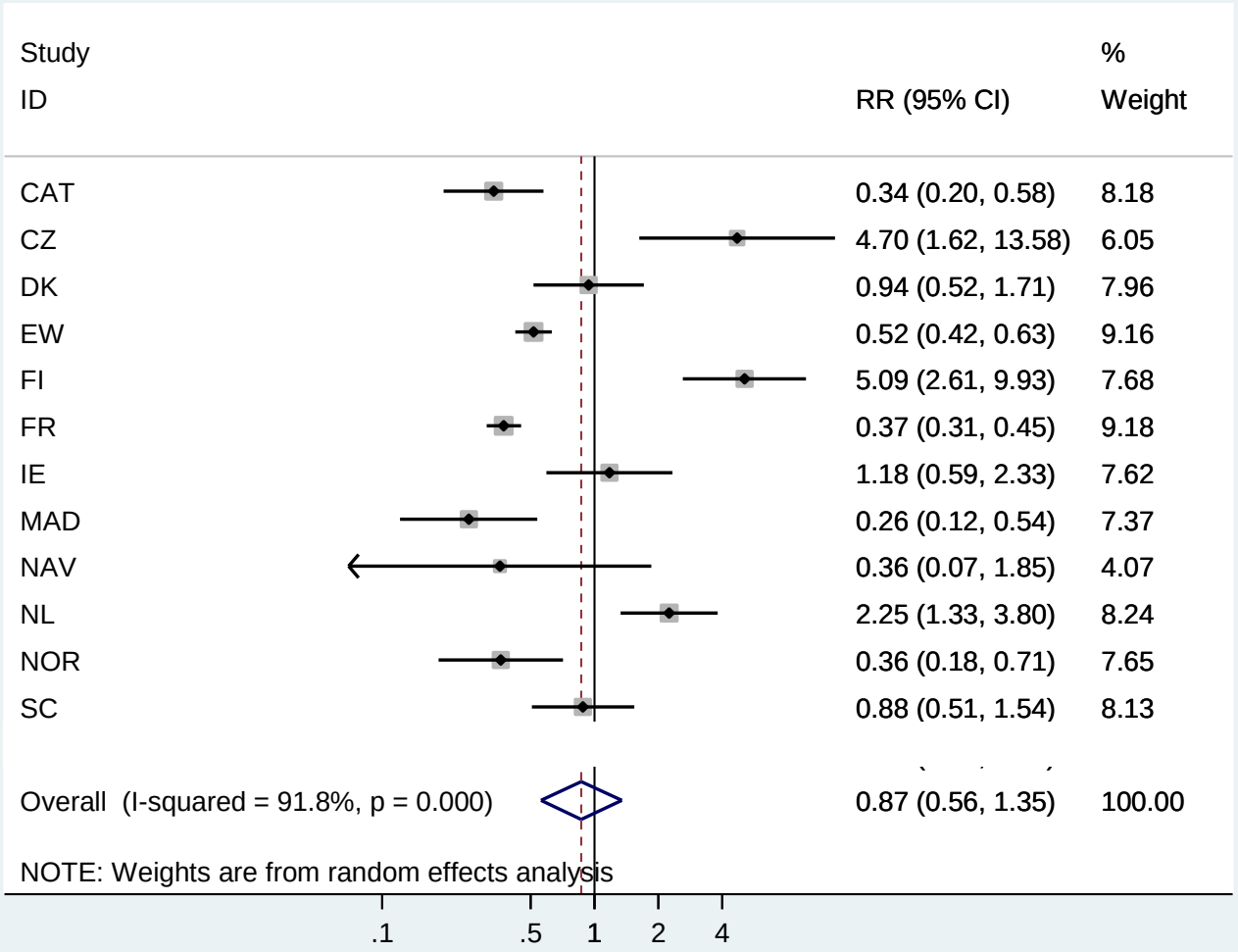


IRR for overall IPD



IRR for 19A

serotype 19A IPD in 65+ years / Year 5 post-PCV10/13 vs 2009



IRR for overall IPD