

# Disclosure Statement

- I am an employee of the GSK group of companies

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# Public health benefit of pediatric pneumococcal conjugate vaccine (PCV) immunization programs in children <5 years

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# Disclosures

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## ***Conflicts of interest***

Shehzad Iqbal and All authors are employees of the GSK group of companies. B. Hoet, P. Izurieta, C. Clarke and M. Moreira hold shares of the GSK group of companies.

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# BACKGROUND AND AIMS

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- There are two high valent pneumococcal conjugate vaccines currently used in pediatric immunization programs
- Post-marketing effectiveness and impact studies have provided substantial evidence on the effect of PCVs on overall invasive pneumococcal disease (IPD) and PCV-preventable IPD (VT-IPD)<sup>1-8</sup> to support public health policies
  - The considerable variability in epidemiological and PCV immunization program features between countries suggests that findings from individual countries cannot be directly compared

**To better characterize PCV impact in children, we assessed changes that occurred in the incidence of IPD in <5-year-olds in the pre- and post-PCV eras, across a range of different countries**

# METHODS<sup>1</sup>

## Search strategy and age group:

- IPD datasets were identified by literature search and from publicly available surveillance reports until December 2016.
- Analyses were done for children <5 years of age

## Selection criteria for countries:

- Population of > 1 million
- Robust well-described surveillance
- Serotype data available for IPD
- Incidence and/or case counts available for pre- and post-PCV eras for overall IPD, VT-IPD and non-PCV-preventable IPD (NVT-IPD)
- Population denominators available to derive incidences from case counts (or vice versa) when needed.
- Data is directly available or can be interpreted from graphs and tables

## Data analysis:

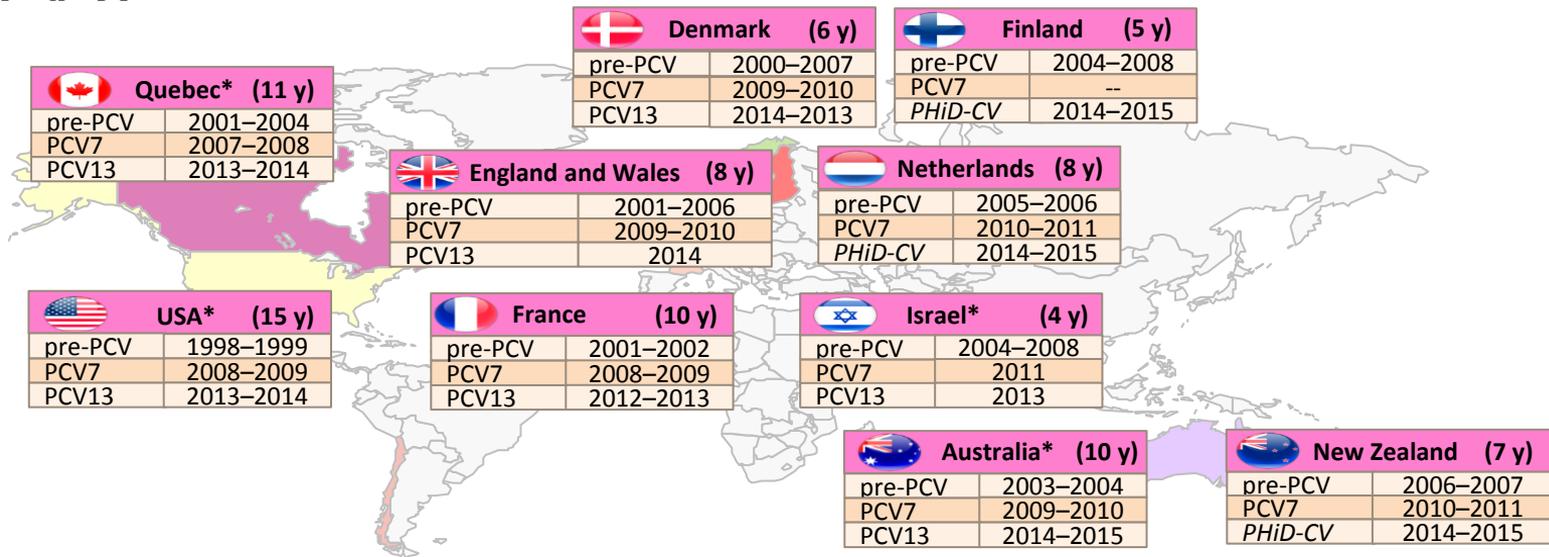
- Wherever reported, analysis periods provided by the authors were used
- If not:
  - Pre-PCV: data for as many years as available
  - PCV7: data from the last 2 years of PCV7 program
  - PHiD-CV/PCV13: data from the most 2 recent years

# RESULTS

Data sets from 10 countries/regions met our selection criteria



Children <5 years

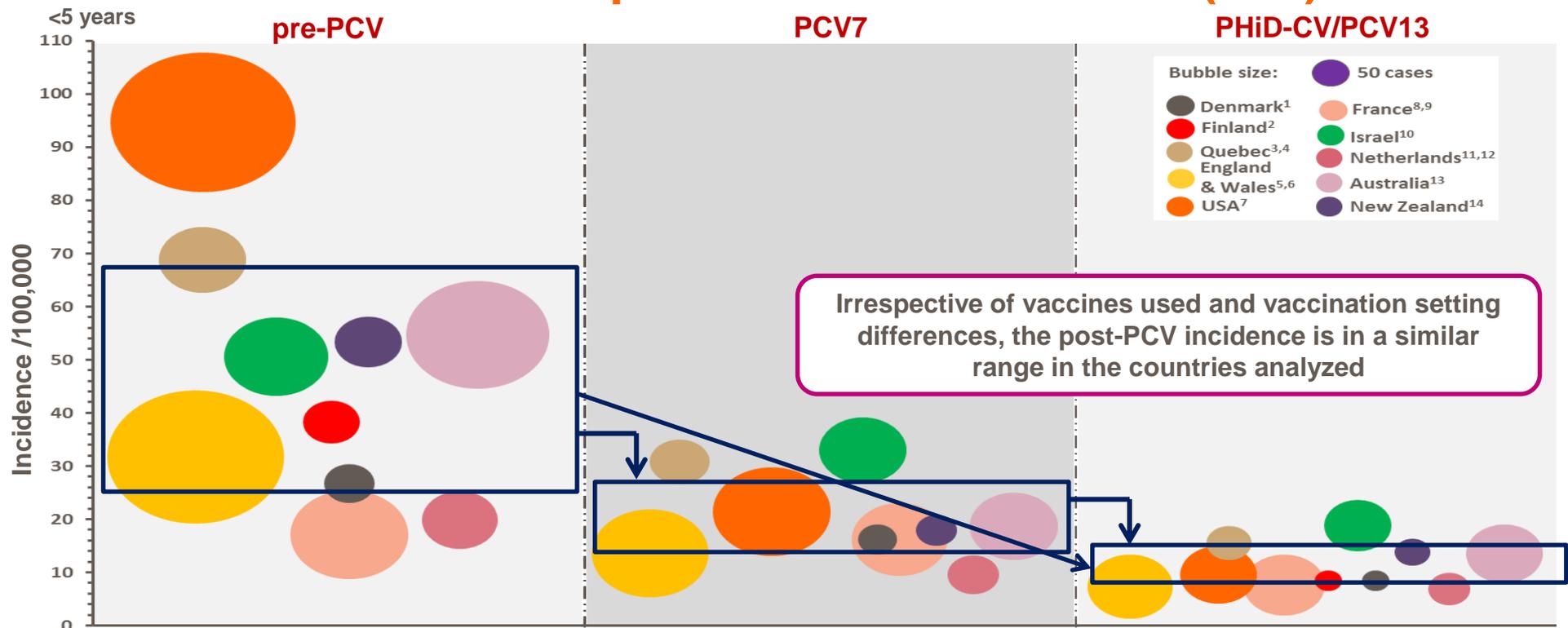


Total duration of PCV programs varied from 4 years (Israel) to 15 years (USA) in our analyses

\*<5 years; PCV, pneumococcal conjugate vaccine; PCV7/13, 7/13-valent pneumococcal vaccine; PHiD-CV, pneumococcal nontypeable *Haemophilus influenzae* protein D conjugate vaccine; y, years



# Overall invasive pneumococcal disease (IPD)



*Some of the data presented in this analysis has been estimated from published figures for illustrative purposes only. Care should be taken when directly comparing actual values from different countries*

PCV7/13, 7/13-valent pneumococcal conjugate vaccine; PHiD-CV, pneumococcal nontypeable Haemophilus influenzae protein D conjugate vaccine

1. Harboe Vaccine Nordic Meeting 2016. Available at: <http://nvm2016.is/sites/default/files/zitte%20barella.pdf> [accessed April 2017] and <http://www.statbank.dk/10021> (for population data) [Accessed April 2017]; 2. THL Finland. Incidence of pneumococcal disease in Finland, June 2016. Available at: <https://www.thl.fi/en/web/thlfi-en/topics/information-packages/incidence-of-invasive-pneumococcal-disease-in-finland> [accessed April 2017]; 3. Institut national de santé publique du Québec (INSPQ) report 2014. Available at: [https://www.inspq.gc.ca/pdf/publications/2081\\_surveillance\\_pneumococque.pdf](https://www.inspq.gc.ca/pdf/publications/2081_surveillance_pneumococque.pdf) [accessed April 2017]; 4. De Wals P, et al. Vaccine 2014; 32: 1501–6; 5. Centre for Disease Control and Prevention. Active Bacterial Core Surveillance 1998–2014. Available at: <http://www.cdc.gov/abcs/reports-findings/surv-reports.htm> [accessed April 2017]; 6. Waight PA, et al. Lancet Infect Dis 2015; 15: 535–43; 7. Miller E, et al. Lancet Infect Dis 2011; 11: 760–68; 8. Lepoutre A, et al. Vaccine 2015; 33: 359–66; 9. France, Centre National de Référence des Pneumocoques (CNRP) 2013 and 2014 reports. Available at: <http://cnr-pneumo.com/docs/rapports/CNRP2014.pdf> and <http://cnr-pneumo.com/docs/rapports/CNRP2015.pdf> [accessed April 2017]; 10. Ben Shimol S, et al. Vaccine 2014; 32: 3452–9; 11. Knol MJ, et al. Emerg Infect Dis 2015; 21: 2040–4; 12. Statistics Netherlands. Population 2000–2015. Available at: <http://statline.cbs.nl/Statweb/?L=eng> [accessed April 2017]; 12. Australia, IPD Quarterly reports 2004–2015. Available at: <http://www.health.gov.au/internet/main/publishing.nsf/Content/cda-surveil-ndss-ipd-reports.htm> [accessed April 2017]; 13. New Zealand. IPD report 2013, 2014 and 2015. Available at: <https://surv.esr.cri.nz/surveillance/IPD.php> [accessed April 2017]





# Non-vaccine preventable serotypes invasive pneumococcal disease

= serotypes except 1, 3, 4, 5, 6A, 6B, 7F, 9V, 14, 18C, 19A, 19F, 23F

pre-PCV

PCV7

PHiD-CV/PCV13



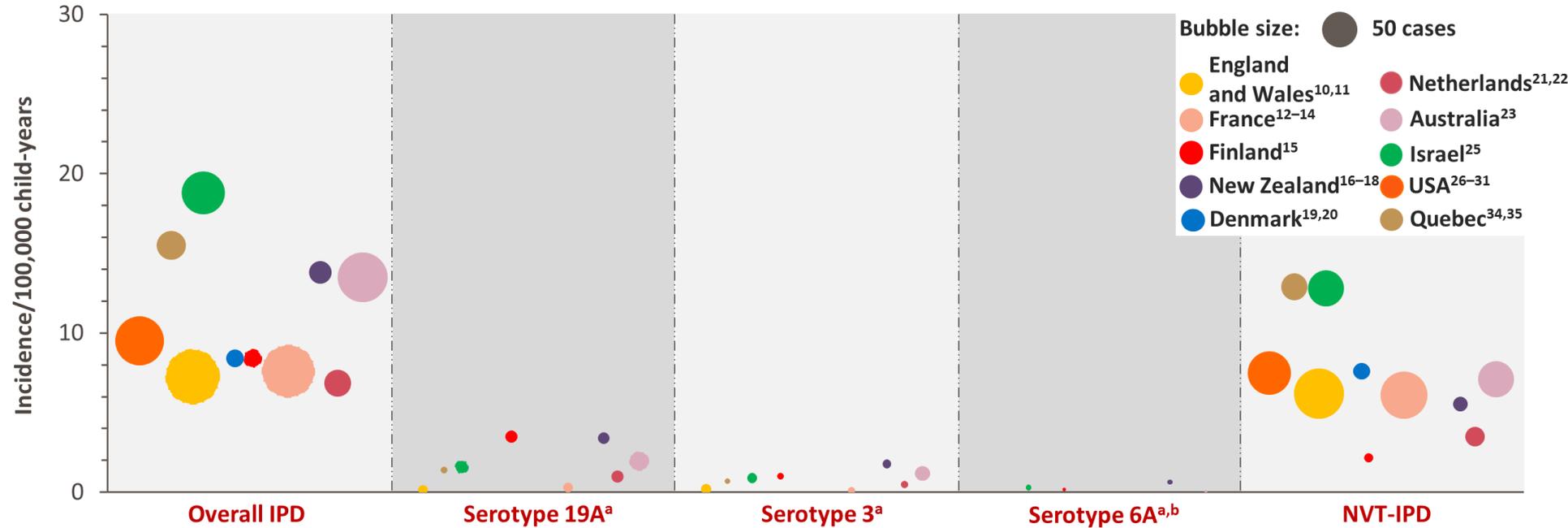
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# RESULTS

## *Invasive pneumococcal disease distribution across analyzed countries by era*



Overall IPD, invasive pneumococcal disease due to any pneumococcal serotype; HV-PCV, higher-valent PCV (PHiD-CV, PCV13). <sup>a</sup>Data not available for Denmark and USA. <sup>b</sup>For New Zealand, 6A and 6C combined data



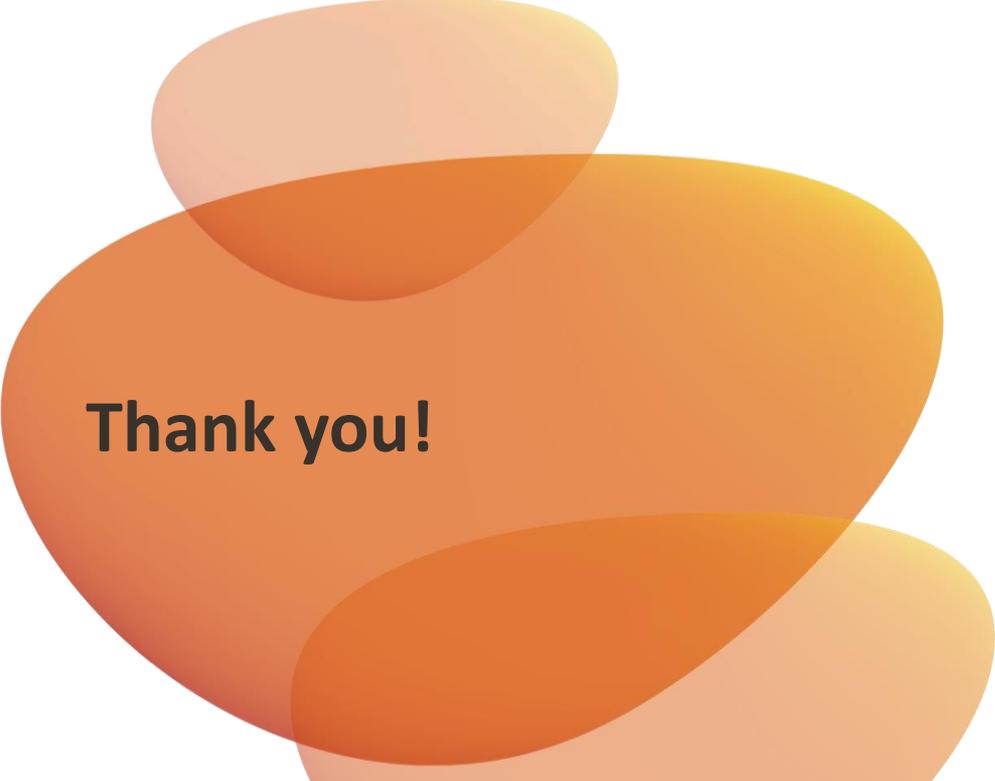
<5 years

## Summary

### The incidence of IPD is now low and in a narrow range across studied countries

- Despite differences in the vaccination programs, including:
  - Vaccine or combination of vaccines selected
  - Schedules
  - pre-PCV incidence
  - Duration of programme
  - Surveillance systems
  - Coverage
- Limitation: Only high-income countries met assessment criteria, findings may vary in other environments

**Following vaccine introduction, VT-IPD is largely eliminated and residual disease is mainly due to NVTs**



**Thank you!**