



European Union

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Impact of vaccination programmes with 10 and 13-valent pneumococcal conjugate vaccines on invasive pneumococcal disease incidence by age group in **SpIDnet/I-MOVE+** countries



ESCAIDE, November 2019



SpIDnet/I-MOVE+ project

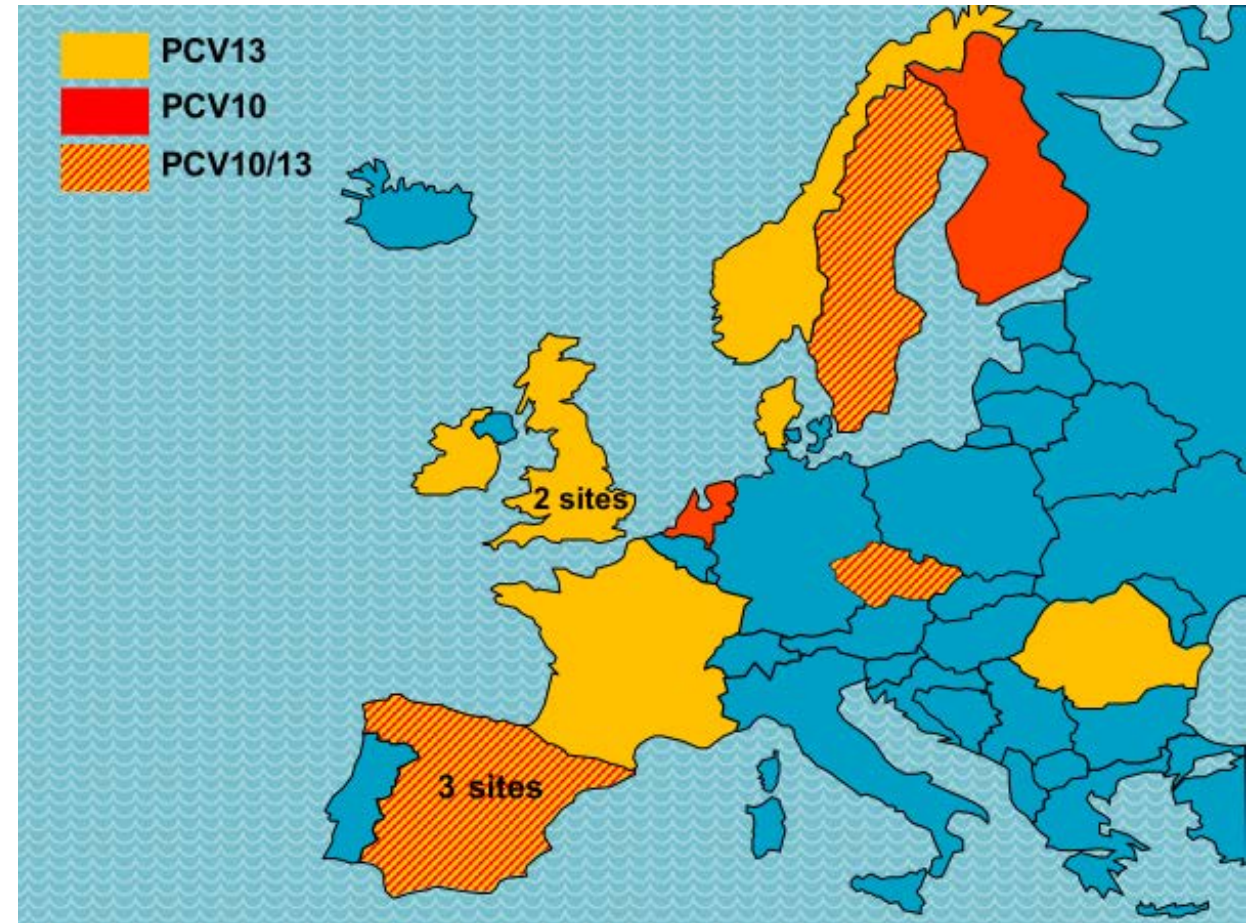
Background and Objective

Enhanced IPD surveillance

- 9.7 million children <5 years
- 131.4 million people 5-64 years
- 32 million people 65+ years

Objective

- To measure the **impact** of PCV10 and PCV13 vaccination programmes (2011-2018) pooling data from **13 sites** in **10 countries** participating in this study



- 2+1 (9 sites)/ 3+1 (4 sites since 2016, 1 site after)
- VC>90% (11 sites) /VC=67-77% (2 sites)

PCV10/13 impact on IPD incidence

Methods

Study design

- Before/after study: retrospective data (13 sites)
Cases: confirmed IPD (ECDC case definition)
Denominators: population by site, age group and year

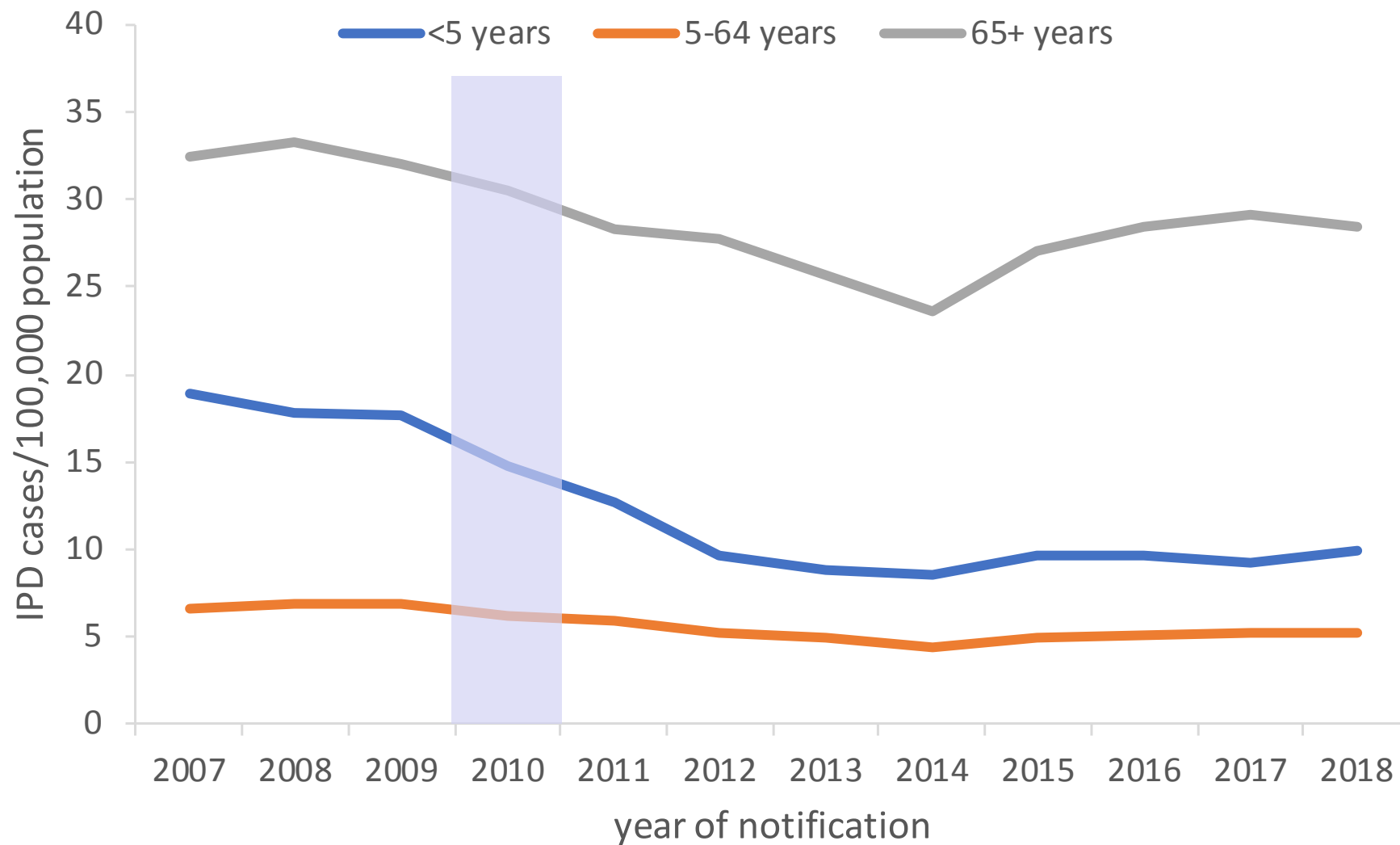
Analysis

- **IPD incidence** by site, year, age group (<5, 5-64, 65+ years) and serotype categories: *total, PCV10non7 (1,5, 7F), PCV13non10 (3, 6A, 19A), nonPCV13 serotypes:* imputed for missing serotypes (13 sites) and adjusted for surveillance sensitivity (3 sites)
- Site-specific **Incidence rate ratios (IRR):**
IPD incidence in post-PCV10/13 years* vs average incidence in the PCV7 period
*(*2010 excluded as transition year)*
- **Pooled IRR, Heterogeneity (Tau²):** random effects meta-analysis
- **Impact:** $(1 - \text{pooled IRR}) * 100$

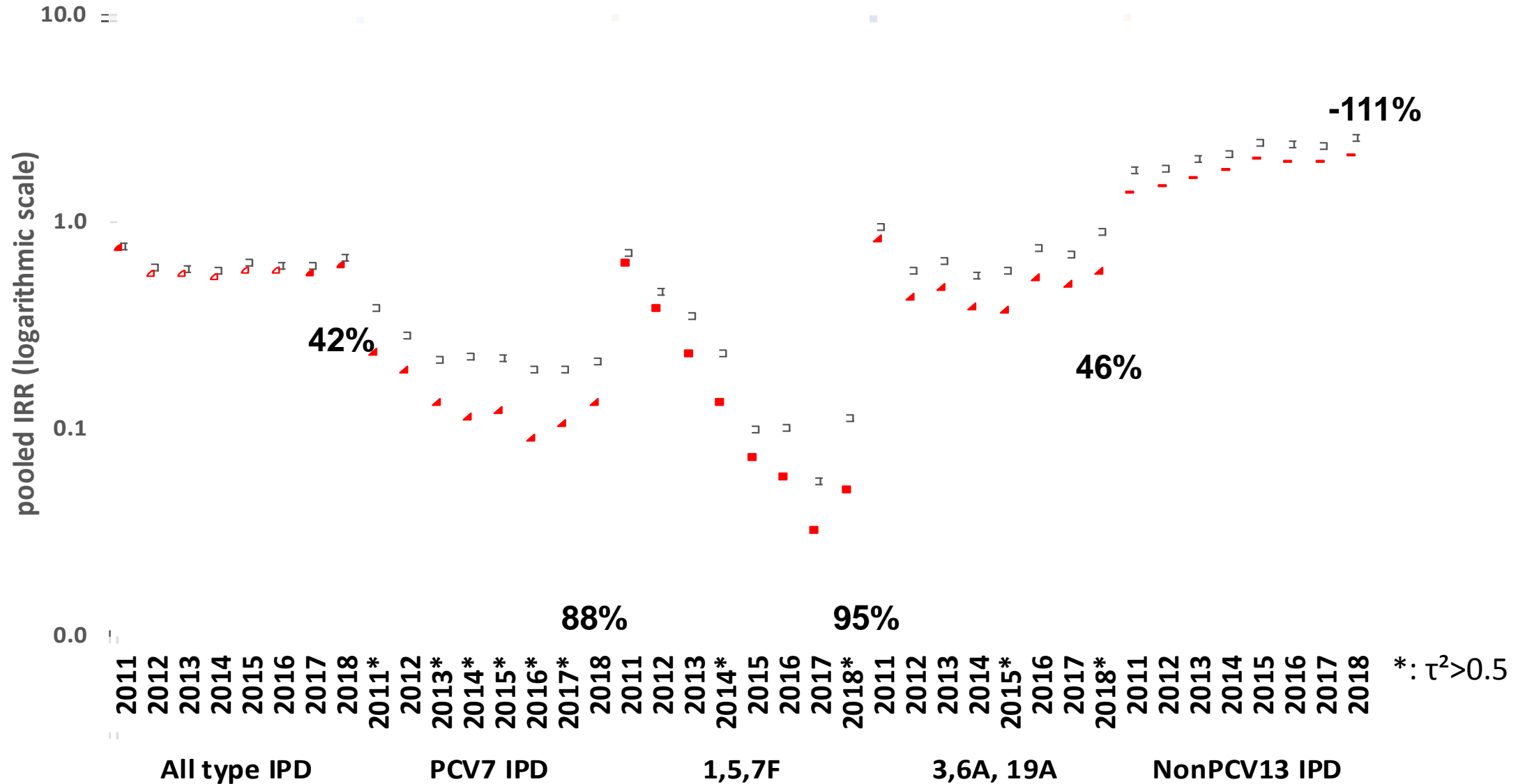
Total IPD cases by site and age group, SpIDnet multicentre study, 2018

Country	Site covering	Cases <5 years	Cases 5-64 years	Cases ≥65 years
Czech Republic	Entire country	25	200	260
Denmark	Entire country	16	255	555
Finland	Entire country	35	334	392
France	Entire country	265	1,513	2,048
Ireland	Entire country	48	197	265
Norway	Entire country	20	212	341
Spain	Catalunya	102	418	531
	Madrid	57	278	277
	Navarra	9	27	32
Sweden	Entire country	41	512	848
The Netherlands	Entire country -sentinel	16	244	428
The United Kingdom	Scotland	42	282	296
	England	288	2,456	3,169
Total network		964	6,928	9,442

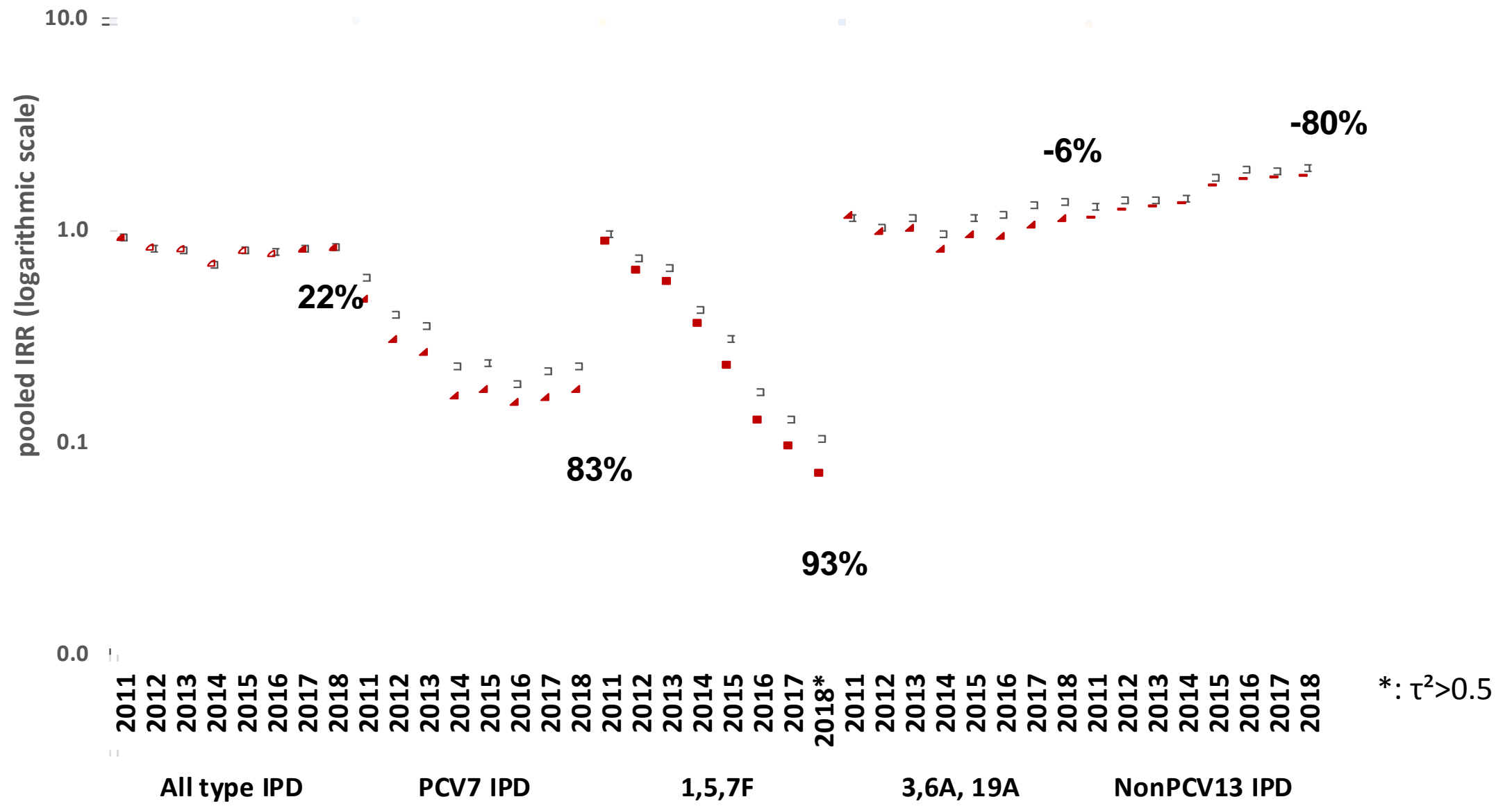
Total IPD incidence by age group, SpIDnet multicentre study, 2007-2018



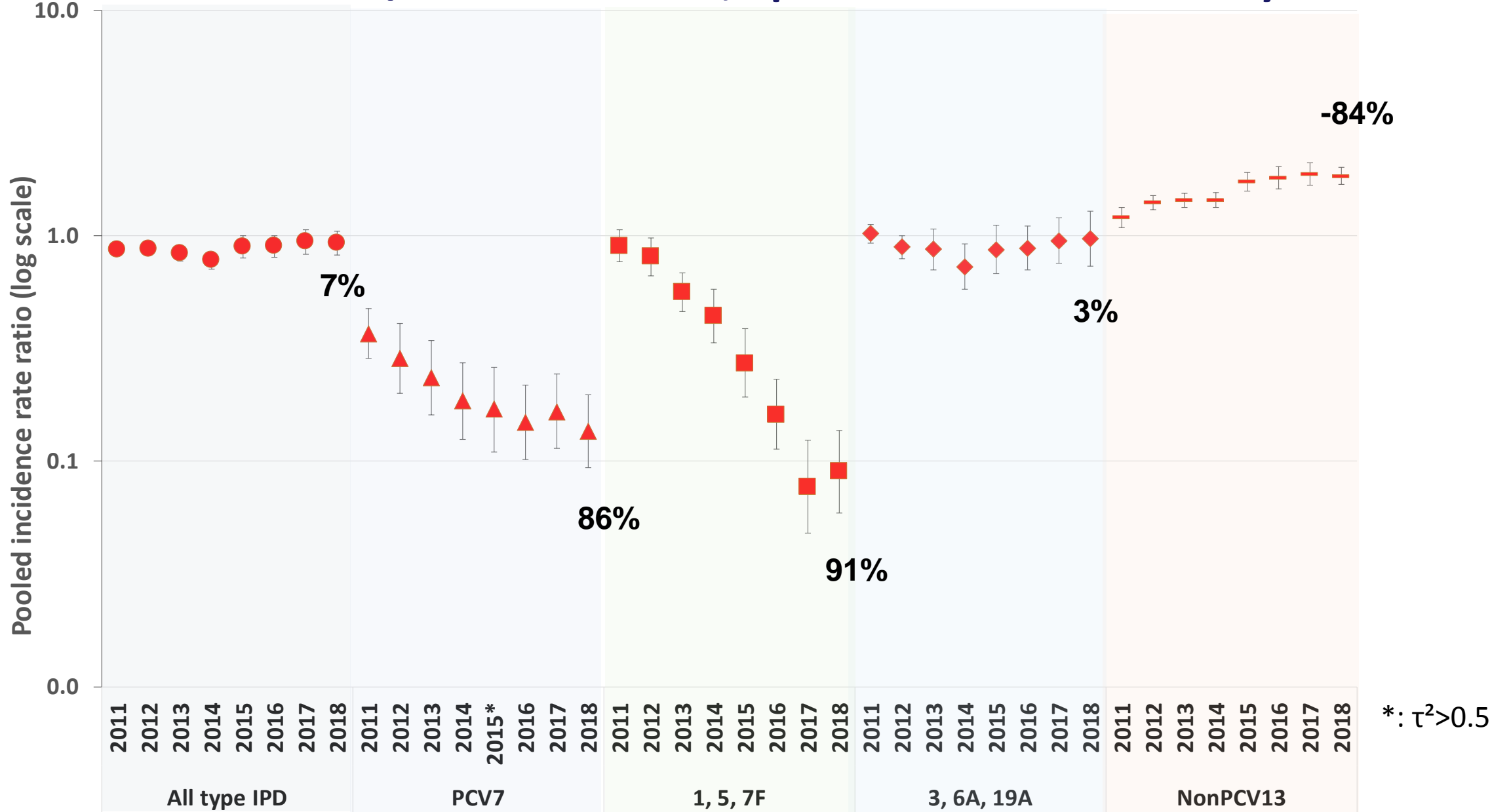
Ratio of IPD incidence (IRR) in children <5years, after PCV10/13 introduction, SpIDnet multicentre study



Ratio of IPD incidence (IRR) in 5-64 years, after PCV10/13 introduction, SpIDnet multicentre study



Ratio of IPD incidence (IRR) in 65+ years, after PCV10/13 introduction, SpIDnet multicentre study



Conclusion and Recommendations

- Highest burden of IPD in the elderly

Compared to the reference period:

- **Decrease** of **vaccine serotype incidence**:
 - PCV7 IPD in all age groups, but stabilised after 2014
 - 1,5,7F IPD in all age groups
 - 3, 6A, 19A IPD decreased in <5 years and same level as reference period in 5-64 and 65+ years
- **NonPCV13 IPD incidence increased** in all age groups
- **No further decrease in all IPD incidence overall in the last 4 years**
 - <65 years: 2018 incidence still below the level of the reference period
 - 65+ years: 2018 incidence at the same level as the reference period

➔ Continued enhanced surveillance in all age groups of crucial importance before the introduction of extended PCV formulations

Analyse temporelle, France

- Impact majeur du PCV13 : > 44 000 cas évités
- Remontée de l'incidence depuis 2015 :
 - Affectant toutes les tranches d'âge, mais surtout <2 ans et >65 ans
 - Méningites et non-meningitis IPD
 - Sérotypes : 24F chez l'enfant, 22F, 12F et 8 chez l'adulte : connus pour avoir un haut disease potential
 - Résistance : signal sur la pénicilline (24F chez l'enfant), reste rare pour le céfotaxime

Sérotypes, France

- Implications :
 - Sérotypes émergents chez l'adultes : compris dans les next PCVs (15 valent : 22F; 20 valent : 12F, 22F, 8). Chez l'enfant : 24F non inclus
 - Sérotype 15B inclus dans le 20 valent mais peu invasif => risque de remplacement, surtout pour le 24F
 - => A prendre en compte dans les nouvelles formulations, et le choix des futurs vaccins à implémenter

SpIDnet team

At the surveillance sites:

Professionals from participating hospitals and laboratories in each site

Czech Republic: P. Krizova, J. Kozakova, H. Sebestova, M. Maly

Denmark: P. Valentiner-Branth, T. Dalby, HC Slotved, Z. Harboe, K. Fuursted

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England and Wales, UK: S. Ladhani, Z. Amin, N. Fry

Spain: M. Viarce Torres (national level)

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- **Navarre:** M. Guevara, J. Castilla, M.E. Portillo, C. Ezpeleta, A. Gil-Setas

At the ECDC: E. Colzani, L. Pastore Celentano;

At the coordination: C. Savulescu, G. Hanquet, M. Valenciano, A. Moren – EpiConcept



I-MOVE+ team (2015-2018)



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Denmark: P. Valentiner-Branth, T. Dalby, HC Slotved, Z. Harboe, K. Fuursted

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Ireland: J. Mereckiene, M. Corcoran, S. Cotter, H. Humphries

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At the coordination:

- **THL:** P. Nuorti, H. Rinta-Kokko
- **Epiconcept:** C. Savulescu, G. Hanquet, M. Valenciano, A. Moren



Thank you!

Děkuji!

Tak!

Merci!

Takk!

Dank je!

Obrigada!

Multumesc!

Gracias!

Tack!

Kiitos!