Change in clinical profile of IPD after PCV13 implementation

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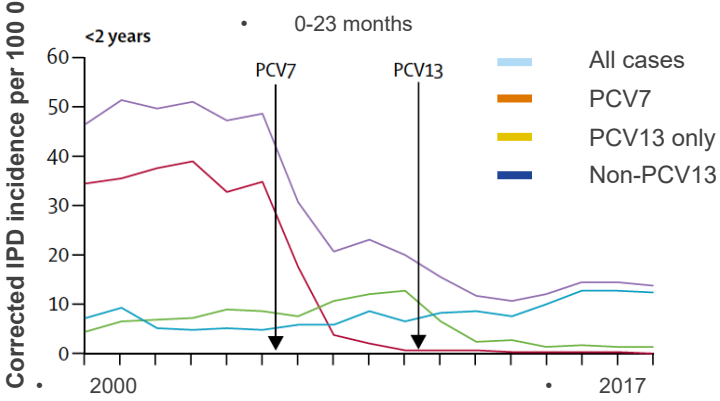
Conflict of interest disclosures

- Participation to Advisory boards, symposia and post-university training
- Invitation to congress : ESPID
- Funding of studies to a research unit that I'm responsible of

  → With GSK, MSD, Pfizer, Sanofi-Pasteur

Link of interest available on https://www.transparence.sante.gouv.fr

Background: In all countries with high vaccine coverage, PCVs implementation has led to a fall of IPD and a change of distribution of ST in the remaining cases in children



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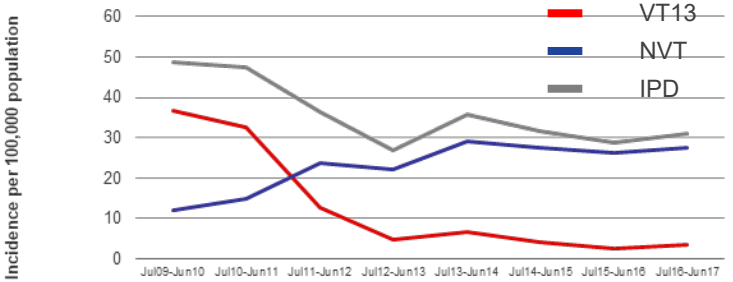

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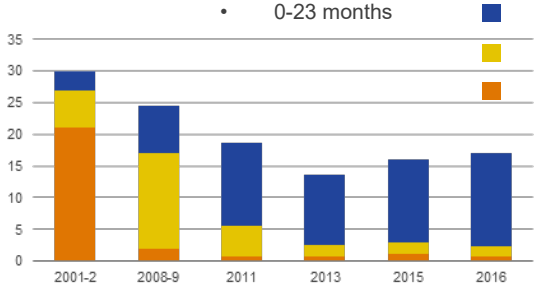

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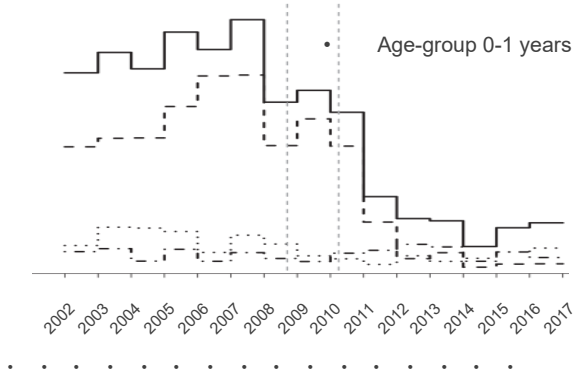

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The aims of our study were

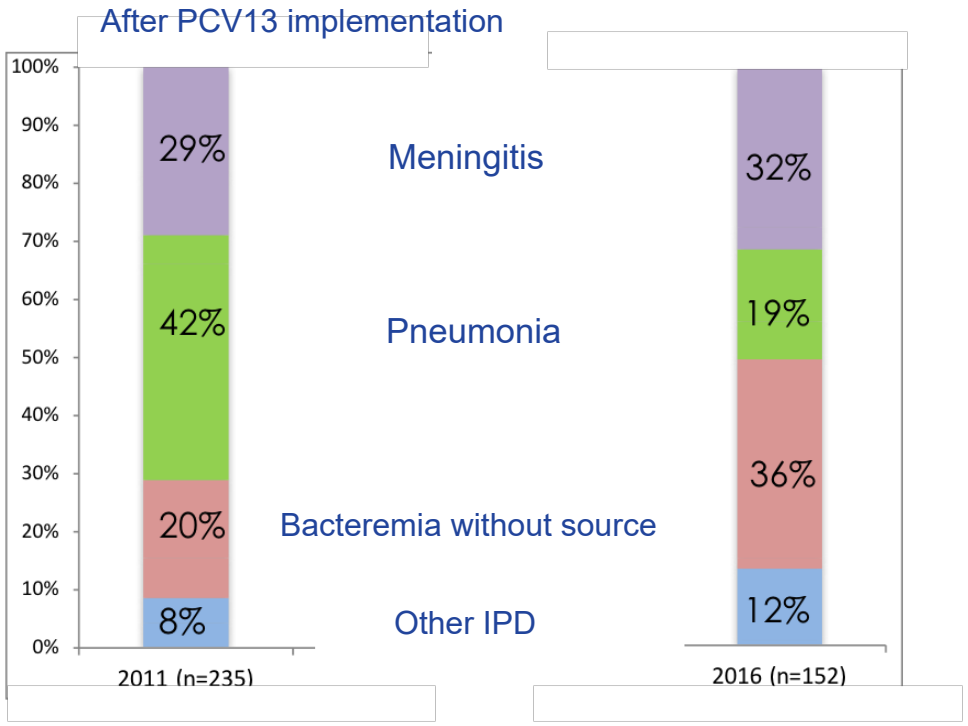
- To describe the changes in the profile of IPD
- To present for each (most frequent) serotype
  - The spectrum of disease induced
  - The rate of patients with underlying conditions after PCV13 implementation

Methods

- Prospective, hospital-based, active surveillance
- Involved 130 pediatric wards and microbiology departments throughout France
- IPD cases from 2011 to 2016 for which a pneumococcal isolate was sent to the National Reference Center for Pneumococci for serotyping were analyzed
- Clinical data recorded were medical history, vaccination status, type of IPD, clinical features and short-term evolution

Distribution of IPD by clinical entities

1082 IPD from 2011 to 2016



35% in total IPD cases

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Distribution of IPD by clinical entities

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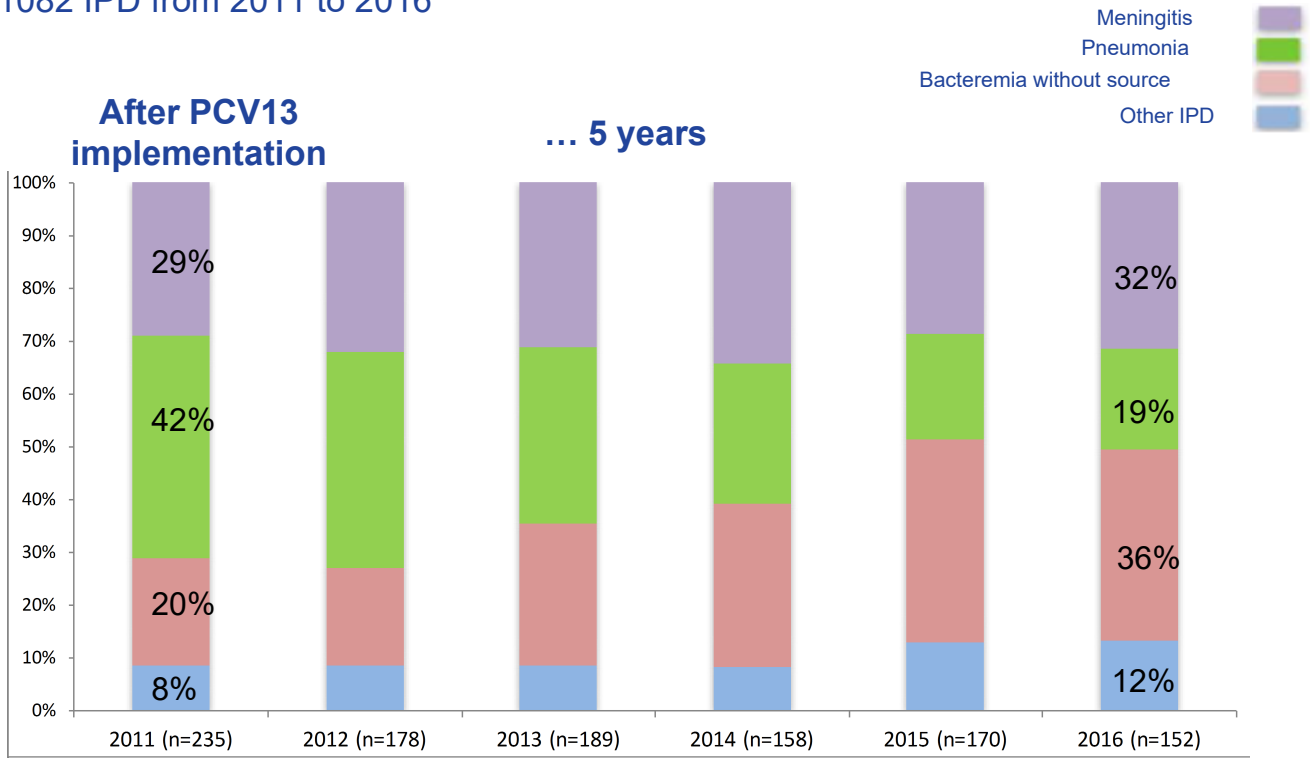

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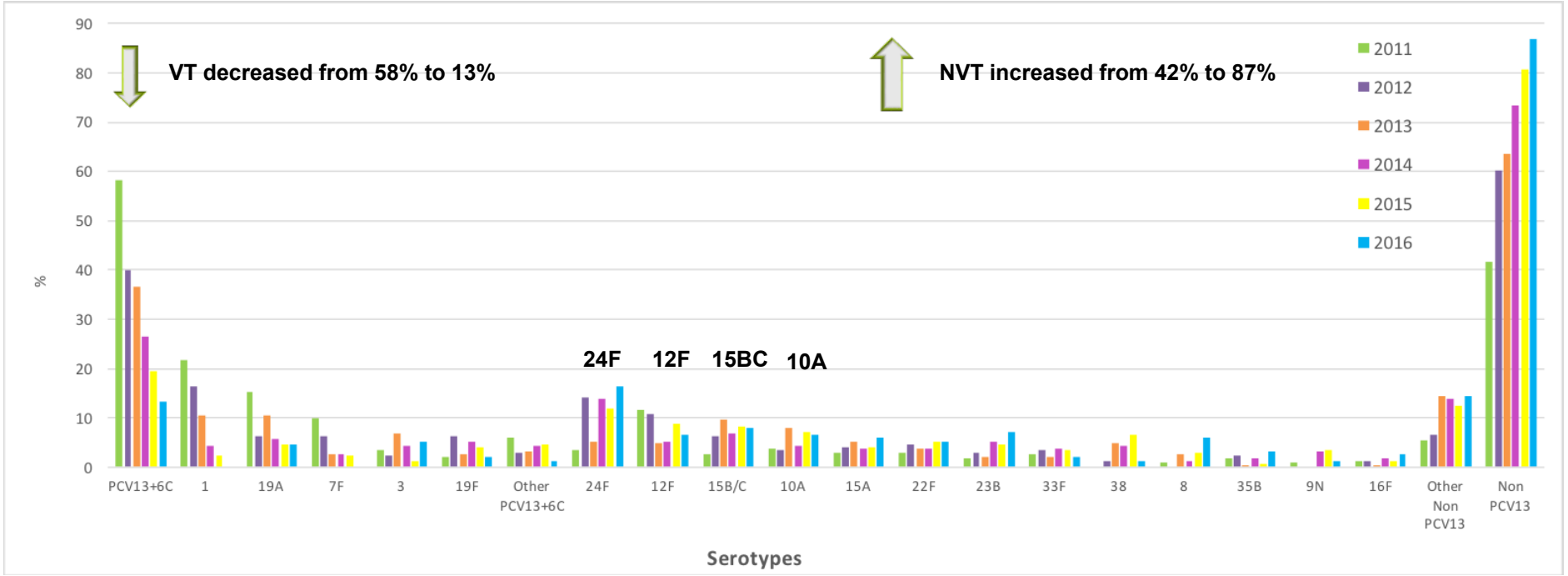
Serotype distribution by study year



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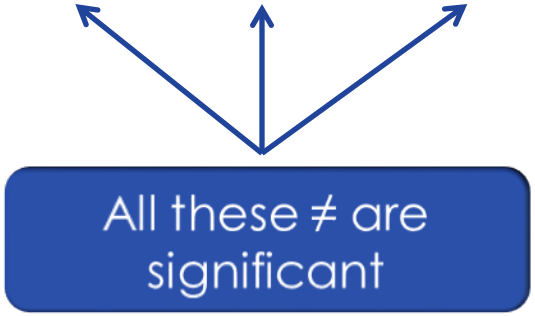
All serotypes were able to induce all clinical presentations, however...

PCV type and serotypes	Pneumonia N=340 % [95% CI]	Meningitis N=335 % [95% CI]	Bacteremia without an identified source N=301 % [95% CI]	Other IPD N=106 % [95% CI]
PCV13+6C (n=372)	58.1 [52.9;63.1]	21.5 [17.4;26.0]	13.2 [9.9;17.0]	7.3 [4.8;10.4]
Non-PCV13 (n=710)	17.5 [14.7;20.5]	35.9 [32.4;39.6]	35.5 [32.0;39.1]	11.1 [8.9;13.7]



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All serotypes were able to induce all clinical presentations, however... for PCV13 serotypes

PCV type and serotypes	Pneumonia N=340 % [95% CI]	Meningitis N=335 % [95% CI]	Bacteremia without an identified source N=301 % [95% CI]	Other IPD N=106 % [95% CI]
PCV13+6C (n=372)	58.1 [52.9;63.1]	21.5 [17.4;26.0]	13.2 [9.9;17.0]	7.3 [4.8;10.4]
1 (n=111)	91.9 [85.2;96.2]	3.6 [0.1;9.0]	0.9 [0.02;4.9]	3.6 [0.1;9.0]
19A (n=91)	45.1 [34.6;55.8]	25.3 [16.7;35.5]	16.5 [9.5;25.7]	13.2 [7.0;21.9]
7F (n=47)	57.4 [42.2;71.7]	25.5 [13.9;40.3]	14.9 [6.2;28.3]	2.1 [0.5;11.3]
3 (n=42)	54.8 [38.7; 70.2]	16.7 [7.0;31.4]	21.4 [10.3;36.8]	7.1 [1.5;19.5]
19F (n=39)	23.1 [11.1;39.3]	48.7 [32.4;65.2]	25.6 [13.0;42.1]	2.6 [0.06;13.5]

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All serotypes were able to induce all clinical presentations, however... for NVT with high and low DP

PCV type and serotypes	Pneumonia N=340 % [95% CI]	Meningitis N=335 % [95% CI]	Bacteremia without an identified source N=301 % [95% CI]	Other IPD N=106 % [95% CI]
Non-PCV13 (n=710)	**17.5 [14.7;20.5]**	**35.9 [32.4;39.6]**	**35.5 [32.0;39.1]**	**11.1 [8.9;13.7]**
High disease potential* (including serotypes 8, 12F, 24F, 33F, n=252)	27.8 [22.3;33.7]	31.3 [25.7;37.5]	32.1 [26.4;38.3]	8.7 [5.6;12.9]
Low disease potential* (including serotypes 15A, 15BC, 23B, 16F, n=173)	9.8 [5.8;15.3]	38.7 [31.4;46.4]	39.9 [32.5;47.6]	11.6 [7.2;17.3]

* Using the classification of Balsells et al. J infect 2018.

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All serotypes were able to induce all clinical presentations, however... For NVT with HIGH DP

PCV type and serotypes	Pneumonia N=340 % [95% CI]	Meningitis N=335 % [95% CI]	Bacteremia without an identified source N=301 % [95% CI]	Other IPD N=106 % [95% CI]
Non-PCV13 (n=710)	**17.5 [14.7;20.5]**	**35.9 [32.4;39.6]**	**35.5 [32.0;39.1]**	**11.1 [8.9;13.7]**
24F (n=110)	25.5 [17.6;34.6]	31.8 [23.3;41.4]	35.5 [26.6;45.1]	7.3 [3.2;13.8]
12F (n=88)	22.7 [14.5;32.9]	25.0 [16.4;35.4]	38.6 [28.5;49.6]	13.6 [7.2;22.6]
33F (n=31)	29.0 [14.2;48.0]	51.6 [33.1;69.8]	16.1 [5.5;33.7]	3.2 [0.8;16.7]
8 (n=23)	56.5 [34.5;76.8]	26.1 [10.2;48.4]	13.0 [2.8;33.6]	4.4 [1.1;21.9]
High disease potential* (including serotypes 8, 12F, 24F, 33F, n=252)	27.8 [22.3;33.7]	31.3 [25.7;37.5]	32.1 [26.4;38.3]	8.7 [5.6;12.9]

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All serotypes were able to induce all clinical presentations, however... For NVT with LOW DP

PCV type and serotypes	Pneumonia N=340 % [95% CI]	Meningitis N=335 % [95% CI]	Bacteremia without an identified source N=301 % [95% CI]	Other IPD N=106 % [95% CI]
Non-PCV13 (n=710)	**17.5 [14.7;20.5]**	**35.9 [32.4;39.6]**	**35.5 [32.0;39.1]**	**11.1 [8.9;13.7]**
15B/C (n=72)	6.9 [2.3;15.5]	31.9 [21.5;44.0]	50.0 [38.0;62.0]	11.1 [4.9;20.7]
15A (n=46)	15.2 [6.3;28.9]	45.7 [30.9;61.0]	26.1 [14.3;41.1]	13.0 [4.9;26.3]
23B (n=40)	5.0 [0.6;16.9]	42.5 [27.0;59.1]	42.5 [27.0;59.1]	10.0 [2.8;23.7]
16F (n=15)	20.0 [4.3;48.1]	40.0 [16.3;67.7]	26.7 [7.8;55.1]	13.3 [1.7;40.5]
Low disease potential* (including serotypes 15A, 15BC, 23B, 16F, n=173)	9.8 [5.8;15.3]	38.7 [31.4;46.4]	39.9 [32.5;47.6]	11.6 [7.2;17.3]

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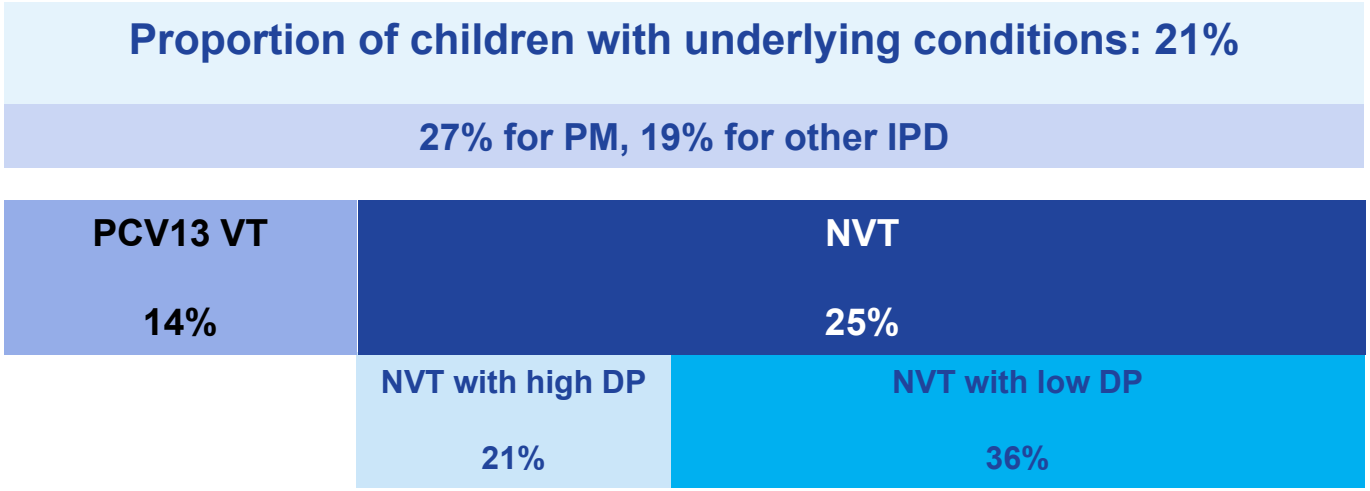
Underlying conditions for cases of meningitis and other IPDs by serotype



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Discussion-Conclusion

- Decrease of about 1/3 of overall IPD after PCV7/PCV13 implementation
  - due to the decrease of PCV13 serotypes (especially 1, 7F, 3, and 19A) frequently implicated in bacteremic pneumonia
- Among the emerging NVTs
  - those considered to have the **highest disease potential** (8, 12F, 24F and 33F)
    - were isolated more frequently in patients **without** underlying conditions ,
    - were able to more frequently induce **bacteremic pneumonia**
  - serotypes with **lower disease potential** (15A, 15BC, 23B and 16F) were rarely involved in bacteremic pneumonia and frequently found in patients **with** underlying conditions

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ACKNOWLEDGMENTS

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