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PUBLIC HEALTH AND ECONOMIC IMPACT OF REPLACING THE SEQUENCE PCV13→PPV23 WITH PCV20 IN THE FRENCH ADULT PNEUMOCOCCAL VACCINATION PROGRAMME

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INTRODUCTION

- In France, anti-pneumococcal vaccination currently recommended in adults in the prevention of pneumococcal infections like pneumonia and invasive infections targets immunocompromised subjects as well as Patients with chronic diseases at risk of pneumococcal infections[1].
- As of July 2023, PCV20 is now recommended in these adult populations instead of the sequence of 13-valent pneumococcal conjugate vaccine (PCV13) followed by pneumococcal polysaccharide vaccine (PPV23)[2].

OBJECTIVE

- The objective of this study was to evaluate the public-health and economic impacts of replacing the sequential administration of PCV13 → PPV23 with a single dose of the 20-valent PCV (PCV20) in the adult French vaccination programme.

METHODS

Structure

- A Markov-type structure was used to assess the impact of the single dose of PCV20 in place of PCV13 and PPV23 used in sequence among the adults at increased risk[1].
- One cohort is vaccinated on the year 1 of the simulation and followed over a lifetime horizon.
- Clinical and economic outcomes, projected annually, include:
  - Cases of IPD and all-cause community acquired pneumonia (AC-CAP)
  - Deaths due to IPD and AC-CAP
  - Life-years (LYs) and quality-adjusted life-years (QALYs)
  - Vaccination and medical care costs for IPD and AC-CAP
- Long term economic and clinical outcomes were discounted at an 2.5% annual rate, progressively decreasing to 1.5% after 30 years.

Parameters

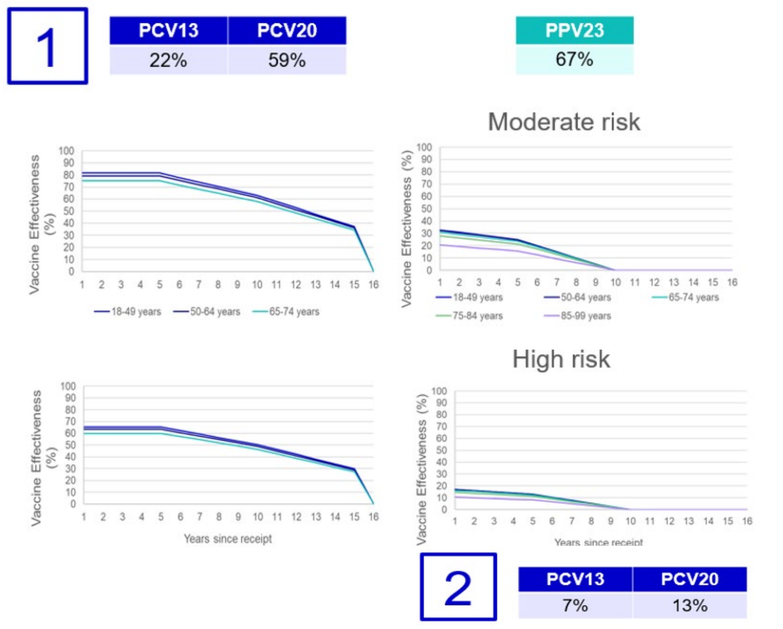
- Parameters were stratified by age and risk groups.
- Epidemiological and costs data for hospitalised cases were sourced from the Système National des Données de Santé (SNDS) and from the CAPA study for ambulatory cases[3]. IPD and CAP serotype coverages were obtained from surveillance data[4].
- The costs inputs were valued in 2022€ under the collective perspective. The costs of managing episodes were derived from a SNDS study, for hospitalised cases, and the literature for the ambulatory cases[5].
- Quality of life data, were informed by the literature[6].

Vaccine effect

- PCV effectiveness was derived from the PCV13 clinical study – CAPITA[7]. The efficacy of PCV13 against vaccine serotypes is assumed to be the same for PCV20 against vaccine serotypes.
- PPV effectiveness was sourced from an observational study conducted in the UK[8]. Based on the available evidence, no effectiveness of PPV against CAP was considered.

METHODS (continued)

Figure 1. Serotype coverage and vaccine efficacy against IPD (1) and CAP (2)



- The coverage for the PCV13→ PPV23 sequence was obtain from the COVARISQ study[9] (SNDS study). For PCV20 a higher vaccination uptake was investigated in the base case

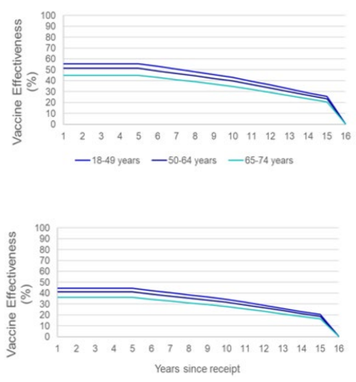
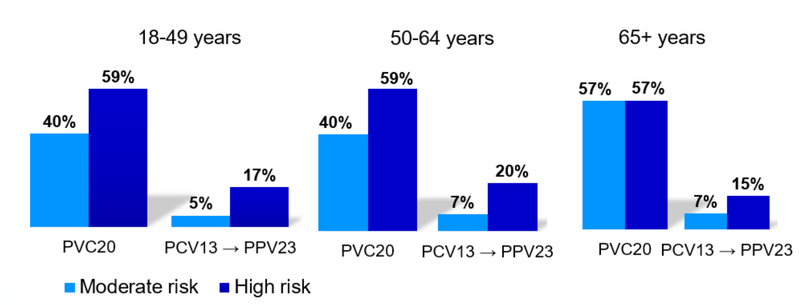


Figure 2. Vaccines uptake



- Due to a higher coverage and the possible availability of PCV20 in paediatric vaccination, the model considers the indirect effect of the vaccine and a diminution of the circulation of the additional serotypes of PCV20. However, it was conservatively assumed that non-vaccine serotypes emerged and replaced them.

RESULTS

Main analysis

- Over a lifetime horizon, the switch from the sequence PCV13 → PPV23 to PCV20 would allow preventing numerous cases, particularly in the AC-PAC and subsequent deaths attributable to the pneumococcus.
- It would therefore translate into significant cost savings (Tableau 1).

Tableau 1. Summary of the results

	PCV20	PCV13 → PPV23	Δ
Cases			
IPD	174,397	178,322	**-3,926**
AC-CAP	25,305,408	25,361,637	**-56,229**
Deaths	2,036,529	2,043,589	**-7,059**
Life-years	1,119,565,931	1,119,503,731	**62,200**
QALYs	925,241,988	925,187,922	**54,065**
Medical costs (K€)	70,174	70,540	**- 367**

RESULTS (continued)

Sensitivity analyses

- When considering a similar uptake for both strategies, PCV20 remains the dominant strategy but does not prevent as many cases (0.2K IPD cases & 3K pneumonia) and disease related deaths (0.4K in total). The main drivers of the results were the PCV effectiveness and the incidence of AC-CAP.

DISCUSSION

- No other publication reported the impact of the switch to PCV20 in France. In the UK, the switch from PPV23 to PCV20 was estimated to prevent over a lifetime horizon over 8K cases of IPD (and 2K associated deaths) and 140K hospitalisations for CAP (and 20K associated deaths)[10].

CONCLUSIONS

- **This study shows that the switch from PCV13→PPV23 to PCV20, as recommended in France since July 2023, is expected to have a significant impact on the public health and economic burden.**
- **The benefit of the switch to PCV20 in the current vaccination programme would be higher along an increase in the uptake enabled by a single administration and the possibility to be vaccinated in pharmacy.**

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Disclosures

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