SYNTHESIS

Review of the vaccination strategy against invasive pneumococcal infections

23 juillet 2026

Key messages

- **For infants**, the HAS recommends replacing the current vaccination schedule with the VPC20 administration schedule, in accordance with the marketing authorisation
- **For infants and children aged 15 months to under 5 years who are at risk of pneumococcal disease (PD)**, the HAS recommends replacing the current vaccination schedule with the VPC20 administration schedule, in accordance with the marketing authorisation
- **For children aged 5 years to under 18 years at risk of PD**, the HAS recommends replacing the current vaccination schedule with the VPC20 administration schedule
- **For adults aged 18 to 64 at risk of PD, including welders regularly exposed to welding fumes, and metalworkers**, the HAS recommends vaccination with a single dose of VPC21, in accordance with the marketing authorisation, as the preferred option
- **For adults aged 65 and over**, the HAS recommends vaccination with a single dose of VPC21, in accordance with the marketing authorisation, as the preferred option

Introduction

To strengthen protection for the population against pneumococcal infections, the French National Authority for Health (HAS) has taken the initiative to reassess the overall pneumococcal vaccination strategy. The aim is, in particular, to define the role of the new, higher-valent conjugate vaccines within this strategy: i) PREVENAR 20, a 20-valent pneumococcal conjugate vaccine (PCV20), for infants, children and adolescents; and ii) the preferred choice between PREVENAR 20 (PCV20) and CAPVAXIVE, a 21-valent pneumococcal conjugate vaccine (PCV21), for adults.

As part of this review, the appropriateness of a recommendation for vaccination against pneumococcal infections for metalworkers or those exposed to welding fumes was assessed jointly at the request of the Ministry of Health.

As part of this assessment, the HAS based its analysis on a systematic, structured and transparent approach known as the ‘Evidence-to-Recommendation’, in accordance with the 2022 WHO guidelines, and drew on various elements in line with the seven decision-making criteria:

Epidemiology of the disease

Epidemiological data on pneumococcal infections in infants, children, adolescents and adults in France:

- **The number of cases of invasive pneumococcal disease (IPD) has been rising steadily** since 2015, exceeding in 2024 the levels seen during the pre-COVID-19 pandemic period (2015 to 2019), with these cases being over-represented among infants under one year of age (26%) and adults over 65 (between 18.7% and 63.7%), and a significant incidence (between 1.8% and 13.9%) in the working-age population, which increases with age;
- ***Streptococcus pneumoniae* remains the leading cause of documented acute community-acquired pneumonia** in France, accounting for at least 60,000 cases annually, although this epidemiological impact is underestimated;
- ***Streptococcus pneumoniae* has been the second most frequently identified pathogen in paediatric intensive care since 2024**, after Bordetella pertussis;
- **Pneumococcus is one of the main bacterial agents identified in non-invasive paediatric infections**, acute otitis media and acute bacterial pneumonia, where a significant proportion of serotypes are now covered by new, broader-spectrum vaccines, such as PCV20;
- The report by the French National Agency for Food, Environmental and Occupational Health & Safety (ANSES) on **the risk of pneumococcal infections among metalworkers or those exposed to welding fumes**.

Data on vaccination coverage and serotype:

- **Paediatric vaccination coverage**, which exceeds 90% among infants up to 24 months of age, is driven by compulsory vaccination, whilst it remains very low among adults, estimated at 10% and 20% among people at increased risk of IPD and immunocompromised patients, respectively. No vaccination coverage data is currently available for people aged 65 and over since the introduction of the 2025 recommendations;
- **Serotype coverage** is expected to be expanded by the new vaccines:
  - In adults, the PCV21 would cover the serotypes responsible for 83.5% of IPD, compared with 62.3% for the PCV20, according to data from the 2026 report by the National Pneumococcal Reference Centre (CNR);
  - In children, coverage of IPD by PCV13 and PCV15 is now very low (16.2 % and 22.6 %, in 2024), indicating that the serotypes included in the vaccines are now in the minority. Several of the emerging serotypes included in the PCV20 are associated with severe IPD, particularly in paediatric intensive care. The introduction of the PCV20 would cover 21.5 % of cases not covered by current vaccines;
  - Among individuals at risk of pneumococcal disease (PD) who are particularly vulnerable, notably children with sickle cell disease, the burden of IPD is predominantly due to serotypes absent from PCV13 and PCV15 but included in the new formulations PCV20 (indicated from 6 weeks of age, according to the marketing authorisation (MA)) and PCV21 (indicated from 2 years of age, MA);

The clinical and biological characteristics of pneumococcal infections:

- ***Streptococcus pneumoniae* is a commensal bacterium of the nasopharynx, with over 100 serotypes** identified to date based on their antigenic structure. It is responsible for invasive diseases such as meningitis, bacteraemia and pneumococcal pneumonia, (pneumonia with pleural involvement);

- **Asymptomatic nasopharyngeal carriage**, which is particularly prevalent among young children, represents the main reservoir for human-to-human transmission;
- **Conjugate vaccines significantly reduce carriage in the paediatric population**. This reduction in carriage contributes to **herd immunity**, which indirectly protects unvaccinated populations by limiting community circulation of the bacterium;
- **A marked serotype replacement has been observed** in documented nasopharyngeal carriage among children in France: the serotypes initially targeted by the PCV7 vaccine, and subsequently by the PCV13 vaccine, have been supplanted by **emerging serotypes such as 15B/C, 23B and 11A, which are predominantly covered by the higher-valency PCV20 and PCV21 vaccines**;
- **Pneumococcal invasive infections have a significant impact on hospital admissions and result in severe long-term effects** (neurological in children, loss of independence in older people);
- **The long-term effects of paediatric meningitis** include irreversible sensorineural hearing loss in 15 to 30% of surviving children, as well as neurocognitive or developmental disorders;
- **Mortality remains significant despite vaccination and hospital treatment:**
  - **In children, around 10% of patients with pneumococcal meningitis die from the condition**, with many survivors suffering neurological sequelae. Mortality can reach nearly 30% in specific populations (e.g. those with sickle cell anaemia);
  - **In adults, the one-year mortality rate following hospitalisation for pneumococcal infection is around 27%,** a particularly high figure frequently associated with marked functional decline and persistent neurological sequelae;
- **One third of invasive serotypes show reduced susceptibility to treatment with beta-lactam antibiotics**, such as amoxicillin, with particularly marked resistance observed in certain emerging serotypes in France.

Healthcare utilisation and costs associated with pneumococcal infections:

- **The annual cost of pneumococcal infections** represents a major financial burden on the French healthcare system, with an annual cost **exceeding one billion euros**, more than half of which is attributable to the care of adults aged 65 and over;
- Direct costs are mainly linked to the frequency of **prolonged hospitalisations** and the **use of intensive care units**, which affect between 22% and 27% of patients, depending on their high risk of pneumococcal invasive disease, age, the presence of certain comorbidities and/or underlying immunosuppression;
- **The post-hospitalisation phase** also requires significant resources across all forms of the disease (IPD, pneumococcal pneumonia), including medical follow-up for 70% of episodes and rehabilitation care for more than half of cases;
- Although vaccination reduces morbidity and mortality, **the economic impact of the disease remains underestimated** (long-term care, indirect costs, notably the loss of independence among older people, and the costs associated with paediatric conditions borne by family members).

Alternative prevention and control measures:

- **Vaccination remains the most effective preventive measure, supplemented by general preventive measures relating to respiratory and hand hygiene**, as well as the avoidance of smoking, a major risk factor for pulmonary complications;
- The existence of **general preventive measures**, not specifically aimed at preventing pneumococcal infections, **amongst welders regularly exposed to welding fumes and metalworkers**.

The benefits and risks of the intervention

Vaccine efficacy data:

– **No clinical data on vaccine efficacy have been reported for PCV20 in the paediatric population or for PCV21 in adults**; the trials relied exclusively on i**mmunological assessment via serological correlates of protection** to evaluate vaccine performance, in accordance with the recommendations of the World Health Organisation (WHO).

Immunogenicity data:

– **In infants (6 weeks to < 15 months):**
  - The **3+1 schedule**, which produces a response similar to that of PCV13, has been approved by the European Medicines Agency for immunisation in this age group. Five clinical trials assessed the immunogenicity of PCV20 in infants: four using a 3+1 schedule (three primary doses + one booster dose) and one using a 2+1 schedule (two primary doses + one booster dose). In the 3+1 regimen trials, four doses of PCV20 co-administered with routine paediatric vaccines induced robust immune responses. Following the booster dose, PCV20 was demonstrated to be non-inferior for the 13 serotypes shared with PCV13. For the seven additional serotypes, the immune responses to PCV20 were compared with the lowest response levels observed with PCV13 for the 13 shared serotypes and met the non-inferiority criteria;
  - The immunogenic responses to the **2+1 schedule** (study B7471012) are broadly comparable to those of the 3+1 schedule 30 days after completion of the vaccination course but appear less favourable 30 days after the primary vaccination (direct protection). Although a post-hoc analysis suggests improved immunogenicity with the 2+1 schedule administered at 3 and 5 months (M3 M5) compared with 2 and 4 months (M2 M4), immune responses remain lower than those of the 3+1 schedule for 8 out of 20 serotypes (M3 and M5 schedules) and up to 16 out of 20 (M2 and M4 schedules), indicating lower protection against these pneumococcal infections prior to the booster dose at 11 months (indirect protection, population-level effect), compared with the three-dose primary vaccination series following the authorised 3+1 schedule;
  - In total, 2,833 infants under 15 months of age received at least one dose of PCV20.
– **In young children (12 to 23 months):**
  - Administration of PCV20 to infants aged 12 to 23 months induces a robust immune response, regardless of whether they had previously been vaccinated with PCV13, according to data from the clinical trial (B7471027, booster dose study) comparing a dose of PCV20 with PCV13.
– **In children and adolescents (15 months to** <18 years):
  - A catch-up dose of PCV20 in children and adolescents aged 2 to 17 years induces a robust immune response, according to data from the clinical trial (B7471014, catch-up study), with one or two doses of PCV20 without a comparator;
  - In total, 622 children aged between 2 and 17 years received at least one dose of PCV20.
– **In adults at risk of PD and adults aged 65 and over:**
  - Real-world vaccine efficacy of PCV20 of 25.6% against IPD and 15.2% against all-cause pneumonia in adults aged 65 and over was reported by an unpublished retrospective cohort study using US Medicare data (2022 to 2024);
– **Among individuals aged 65 and over without comorbidities** (low-risk subgroup), real-world efficacy against IPD was 33.8%;
– **No data allowing a direct comparison between the PCV15 and the PCV20 has been identified;**

– **To date, there are no data regarding the duration of protection provided by PCV20 and PCV21**.

Pharmacovigilance, safety and tolerability data:

– **In infants (6 weeks to < 15 months):**
  • **The tolerability and safety profile of PCV20 was comparable to that of PCV13** in the five clinical trials, across different dosing regimens and routes of administration. The studies were conducted under conditions representative of routine practice, including co-administration with routine paediatric vaccines. However, they were limited to healthy infants. Comparable rates of local and systemic adverse reactions (ARs), which were mild to moderate in severity and resolved rapidly. Serious adverse events were rare and comparable between the PCV20 and PCV13 groups and were not attributed to the vaccine. No newly diagnosed chronic medical conditions (NDCMC) considered to be related to vaccination, nor any deaths, were reported during the studies.
– **In young children (12 to 23 months):**
  • The safety and tolerability profile of PCV20, administered as a booster or catch-up dose, was comparable to that of PCV13 in both clinical trials.
– **In children and adolescents (15 months to < 18 years):**
  • The safety and tolerability profile of a catch-up dose of PCV20 was comparable to that of PCV13 in children and adolescents. A catch-up dose of PCV20 was associated with mild to moderate adverse events that resolved rapidly; there were no serious adverse events or new clinically significant diagnoses related to vaccination. No deaths were reported during the study.
– **To date, no data are available concerning children and adolescents at risk of** pneumococcal infections, who meet one or more eligibility criteria for pneumococcal vaccination in France;
– **Pharmacovigilance monitoring of the PCV20 and PCV21 vaccines confirms a safety profile consistent with that observed in clinical trials**, with no major safety signals identified.

Data on co-administration:

– **In the paediatric population:**
  • Multiple vaccines may be administered at the same time, provided that separate injection sites are used (see Immunisation schedule). PCV20 may be administered concurrently (during the same session) with routine paediatric vaccines. This includes vaccines against:
    - diphtheria, tetanus and whooping cough,
    - hepatitis B and hepatitis A,
    - Haemophilus influenzae type b,
    - polio (inactivated),
    - measles, mumps and rubella,
    - chickenpox,
    - rotavirus,
    - invasive meningococcal infections,
    - seasonal influenza.
– **In the adult population:**
  • PCV20 may be co-administered with:
    - the seasonal inactivated influenza vaccine,
    - the available messenger ribonucleic acid (mRNA) and non-mRNA COVID-19 vaccines,
    - using different injection sites.

- PCV21 may be co-administered with:
  - the quadrivalent influenza vaccine.

Data on interchangeability with other pneumococcal vaccines:

– **No data have been identified regarding the interchangeability of pneumococcal vaccines;**
– A single clinical trial showed that children aged 15 months to under 5 years, as well as those aged 5 to under 18 years (n = 831), who started a vaccination programme with PCV13 can continue it with PCV20, in accordance with the current vaccination schedule.

Specific populations:

– **No data were identified for PCV20 in at-risk children;**
– PCV20 has a safety and tolerability profile comparable to that of PCV13 in late-preterm infants (n = 77 exposed to PCV20 in a 3+1 schedule, study B7471013);
– No specific data concerning metalworkers and occupational exposure (welding fumes) have been identified.

The results of the dynamic epidemiological modelling developed by Institut Pasteur, based on national historical data (carriage, IPD) covering more than 20 years, evaluating twelve vaccination scenarios over time horizons of between 3 and 10 years, and drawing on a grouping of serotypes specific to the French context as well as working hypotheses validated with internationally recognised French experts:

– **For the general population, with a 5-year IPD simulation period, the most favourable scenario is the one combining preferential PCV20 for children and preferential PCV21 for adults**, resulting in the greatest cumulative reduction in IPD cases over time;
– **In infants, the switch to PCV20** is consistently the most effective scenario, regardless of trends in adult vaccination coverage;
– **In adults aged 65 and over, the switch to PCV21** yields the best results, regardless of the paediatric vaccination scenario;
– Factors influencing the interpretation of the results include:
  - **Serotype replacement is difficult to predict** following the introduction of the PCV20 vaccine in children, due to high variability in long-term projections (over 7 to 10 years);
  - **The theoretical scenario of '50 % PCV15 / 50 % PCV20 in children'** is unrealistic given the prescribing patterns observed during the introduction of previous vaccines (PCV7, PCV13 and PCV15), which showed a predominantly preferential adoption of a higher-valency vaccine where available;
  - **Increasing adult vaccination coverage (up to 75 % or 90 %)** boosts the expected health gains, without altering the hierarchy of strategies.

International vaccination recommendations:

– **The roll-out of the PCV20 vaccine for infants varies internationally**. Most European countries that recommend the PCV20 follow the four-dose vaccination schedule (three doses for primary vaccination and one booster dose, 3+1) in accordance with the marketing authorisation;
– **The preferential use of the PCV20 in the general paediatric population has not been endorsed by certain national bodies**, notably STIKO in Germany and the Dutch Health Council,

citing feasibility issues relating to the administration of an additional dose to infants (the 3+1 schedule as per the marketing authorisation, instead of the 2+1 schedule) or an unfavourable cost-effectiveness ratio compared with the PCV15;

- **In adults**, European and North American strategies now incorporate **the PCV20 and PCV21 vaccines, with approaches varying from country to country**: preferred schedules, sequential administration with the PPSV23 (23-valent pneumococcal polysaccharide vaccine), or recommendations targeted by age and risk levels;
- **There is international consensus on the comorbidities likely to increase vulnerability to pneumococcal infections**. Differences of opinion remain regarding certain factors (smoking, alcoholism, obesity, Down's syndrome), which have not been included at this stage in France following discussion with experts;
- **The inclusion by several countries of vaccination recommendations specifically targeting metalworkers and welders exposed to welding fumes** (the United Kingdom, Germany, Ireland, Norway, Belgium, Austria and Canada).

The values and preferences of the target population

- **Among infants, there is high parental compliance** with compulsory vaccination to prevent severe invasive forms of the disease and their sequelae;
  - Surveys on the acceptability of a modified vaccination schedule reveal contrasting views depending on the populations surveyed:
  - Strong support in principle for extending protection: A survey of around 2,500 adults shows that parents and healthcare professionals accept the idea of an enhanced schedule or additional doses if the clinical benefit in terms of serotypes is demonstrated.
  - Possible logistical concerns amongst prescribers: A survey of 250 general practitioners highlights that they fear an additional dose (3+1 schedule) might undermine families' adherence in the long term and hinder the completion of the vaccination course.
  - The results of these two studies must be interpreted with caution, given several methodological limitations common to both surveys, which may affect their robustness and scope.
- **Among adults, uptake is insufficient**, mainly due to a lack of information; only 29% of people aged 65 and over report being aware of the existence of these vaccines;
- **Acceptability within the adult population depends heavily on the recommendation of the attending general practitioner (GP).**

Healthcare utilisation and costs

- In terms of the disease's impact on health, according to projections from the epidemiological model and economic assessments **based on a five-year simulation period for the current vaccination strategy** (PCV13 and PCV15 for children; PCV20 and PCV21 for adults):
  - IPDs occurring over a five-year period result in a high hospital burden, with **17,426 hospitalisations**, long stays and numerous admissions to specialist or intensive care units, particularly among adults aged 65 and over;
  - **3,198 patients** suffered from post-acute sequelae, representing nearly a quarter of hospitalised cases;
- In terms of economic impact, the total cost over five years of managing IPD and its consequences, as well as the current vaccination programme, is estimated at 1.509 billion euros;

- **Economic analyses highlight that the current vaccination strategy in France is not cost-effective:**
  - The two cost-effective strategies at current vaccine prices are a complete switch to the 21-valent vaccine (PCV21) for adults, combined with a complete switch to the 15-valent vaccine (PCV15) (100%) for children, or a switch to equal proportions of PCV15 and PCV20 (50/50%). The latter constitutes a theoretical scenario that is unlikely to be feasible in practice;
  - Compared with a 100% PCV15 strategy, the partial introduction of PCV20 in children reduces the number of quality-adjusted life years (QALYs) lost due to the disease and results in additional costs, leading to a incremental cost-outcome ratio (ICER) of 145,979 euros per QALY;
  - If PCV20 were to replace PCV15, the ICER would be €305,000 per QALY;
- These results are highly sensitive to the price of PCV20; a reduction in its price would significantly improve its cost-effectiveness:
- At the current price of PCV20, the 3+1 schedule for PCV20 in infants results in a significant additional cost due to the added fourth dose. The additional cost over five years of strategies involving a switch to PCV20 for children whilst maintaining the current strategy for adults is estimated at 120.5 million in the case of partial replacement, where PCV20 coexists with PCV15 on a 50-50 basis, and 233.8 million euros in the case of complete replacement.

Ethics

- The vaccination strategy is based on a favourable risk-benefit balance, respect for autonomy, and a commitment to equity;
- Among at-risk populations, early access to broad-valency vaccines is justified to prevent any loss of opportunity.

Feasibility

- **The characteristics of the two vaccines, PCV20 and PCV21**, allow for their immediate distribution via the standard channels (community pharmacies and health centres);
- Long-term supply can be ensured:
  - **In the paediatric population, the inclusion of PCV20 in the 3+1 schedule for infants has no impact on the vaccination schedule**. An additional dose is fully compatible with the existing mandatory check-ups at two, three, four, five and six months, allowing for harmonised co-administration with other routine paediatric vaccines;
  - **In adults**, harmonising the strategy between at-risk populations and adults aged 65 and over has simplified the vaccination pathway and facilitates adherence by healthcare professionals and patients;
  - The recommendation for PCV20 in infants instead of the currently recommended vaccines, as well as the preferential recommendation for PCV20 or PCV21 in adults, requires planning for a structural increase in demand.

Stakeholder acceptance of the draft recommendation

- The results of the public consultation, which ran from 7 May 2026 to 25 May 2026 and was aimed at key stakeholders in the vaccination sector, were collected via an online questionnaire made available on the HAS website. All responses received were analysed to draw up the final version of the document. These responses are available on the HAS website:

- Most respondents, between 68% and 74%, expressed support for the recommendations for all three population groups. The expansion of serotype coverage is a key shared argument, tailored to the specific challenges facing each group: population-level impact among infants and enhanced protection for at-risk children (PCV20), and optimisation of serotype coverage among adults (PCV21);
- Despite the expectations expressed regarding clinical efficacy data and clarity on organisational arrangements, the high level of support from respondents, together with the convergence of the arguments put forward, underpin the relevance of the proposed recommendations for all the target populations.

Considerations and recommendations

Following its assessment, considering:

– **Criterion 1: The health issue**
- The epidemiological situation and the health and societal impact of pneumococcal infections in France, which continue to constitute a major public health problem due to their incidence, severity and associated mortality;
- An increased risk of PD among metalworkers or those exposed to welding fumes, and the fact that in France 528,000 employees are potentially exposed to welding fumes;

– **Criterion 2: The benefits and risks of the intervention**
- Data on the immunogenicity of PCV20 indicating enhanced protection in infants following a four-dose schedule (three primary doses and one booster dose), and a favourable safety and tolerability profile when co-administered with routine paediatric vaccines: no safety signals were identified;
- Real-world efficacy data for PCV20 in adults aged 65 and over show an estimated protection of 25.6% against IPD and 15.2% against pneumonia from all causes;
- Clinical data on PCV21 in adults indicate that this vaccine has immunogenicity that is not inferior to that of PCV20 for the shared serotypes, and enables vaccination coverage to be extended to additional serotypes, several of which are frequently implicated in IPD in adults in France;
- The favourable post-marketing safety profile of the PCV20 and PCV21 vaccines in France and internationally;
- Projections from a mathematical model based on historical French data, which identifies a vaccination strategy combining PCV20 in infants and PCV21 in adults as the most effective for reducing the incidence of pneumococcal infections;
- The experience with previous pneumococcal vaccines, which, despite the occurrence of serotype replacement over time, have led to a sustained reduction in pneumococcal infections, without a return to pre-vaccination levels;
- The position of the members of the ‘Children at Risk’ working group, who unanimously recommended the use of PCV20 as a substitute for the sequential regimen of PCV13 or PCV15 followed by PPSV23 in the paediatric population at risk;

– **Criterion 3: The values and preferences of the target population**
- The high level of acceptance of an enhanced four-dose PCV20 vaccination schedule for infants among parents and healthcare professionals;
- The central role of a referral from the general practitioner as a key determinant of adults’ acceptance of and adherence to vaccination;

– **Criterion 4: The use and costs of healthcare**
- The high hospital burden associated with IPDs, with an estimated cost of €233.7 million over five years;

- Frequent post-acute sequelae, affecting approximately 25% of hospitalised cases, with an estimated cost of €70 million over five years;
- Significant mortality and loss of health, with 2,799 deaths over five years, corresponding to 42,415 life years and 54,411 QALYs lost;
- The economic evaluation shows that the PCV21 vaccine in adults is cost-effective, regardless of the paediatric strategy adopted, whilst the cost-effectiveness of the PCV20 vaccine in children compared with the PCV15 vaccine depends on the price of the vaccine;

– **Criterion 5: Ethics**
- As the pneumococcal vaccination strategy does not raise any ethical concerns, being based on a demonstrated net benefit, established safety and prioritisation based on the risk of pneumococcal infection in order to avoid any loss of opportunity;

– **Criterion 6: Feasibility**
- The characteristics of the PCV20 and PCV21 vaccines, which are based on proven technology, are compatible with the standard cold chain, and are readily available;
- A feasible organisation of the vaccination schedule, with the option to adapt it for children whilst maintaining the existing schedule for adults;
- Appropriate surveillance and supply systems, subject to the implementation of targeted communication initiatives to reduce inequalities in access, particularly amongst certain adults and in the event of changes to the paediatric schedule;

– **Criterion 7: Acceptability of the draft recommendations by stakeholders**
- The results of the public consultation in favour of the proposed recommendations for all three target populations;

And despite:

– **Criterion 2: The benefits and risks of the intervention**
- Limited data on the direct clinical efficacy and duration of protection of the PCV20 and PCV21 vaccines;
- The lack of data on clinical efficacy, immunogenicity, tolerability and safety in specific populations, particularly in at-risk children;
- Persistent uncertainties regarding serotype replacement, limiting the ability to reliably project the effects of these strategies over a period of the IPD simulation exceeding 5 years;

– **Criterion 4: Healthcare utilisation and costs**
- A significant additional cost associated with the PCV20 vaccination strategy, due to the fourth dose administered to infants;

The HAS recommends:

The use of the PCV20 vaccine in infants instead of the current vaccination strategy.

For infants from 8 weeks of age:

– The HAS recommends replacing the current vaccination schedule – which involves two primary doses and one booster dose with the PCV13 or PCV15 – with the PCV20 schedule comprising three primary doses at 2, 4 and 6 months of age, with the booster dose administered at 11 months of age, following the 3+1 schedule, in accordance with the marketing authorisation.

For preterm infants (less than 37 weeks' gestation):

– The HAS recommends that preterm infants be vaccinated with PCV20, with three primary doses at 2, 4 and 6 months of age, and the booster dose administered at 11 months of age, following the 3+1 schedule, in accordance with the marketing authorisation.

For unvaccinated infants aged 7 months to under 12 months:

– The HAS recommends two doses of PCV20 with an interval of at least 4 weeks between doses, in accordance with the marketing authorisation;
– A third dose of PCV20 is recommended during the second year of life, in accordance with the marketing authorisation.

For unvaccinated infants aged 12 months to under 24 months:

– The HAS recommends two doses of the PCV20 with an interval of at least 8 weeks between doses, in accordance with the marketing authorisation.

The HAS recommends the use of PCV20 in infants;

The HAS recommends discontinuing the use of PCV13 and PCV15 in infants and preterm infants;

PCV20 may be administered concurrently with other vaccines recommended for these age groups.

The use of the PCV20 vaccine in infants and children at risk of PD, instead of the current vaccination strategy.

In infants and children at risk of PD aged between 15 months and under 5 years:

– The HAS recommends replacing the current vaccination schedule – which involves administering PCV13 or PCV15 followed by PPSV23, from the age of 2 years and 8 weeks after the last dose of a pneumococcal conjugate vaccine or one year after the PPSV23 dose – with the PCV20 administration schedule;
– The HAS recommends a single dose of PCV20 for individuals who have already completed their vaccination schedule with a PCV, subject to a minimum interval of 4 weeks after the last dose of a pneumococcal conjugate vaccine, in accordance with the marketing authorisation;
– The HAS recommends lowering the age for vaccination with PCV20 to 15 months, instead of 24 months, in line with the marketing authorisation.

For at-risk children aged 5 years to under 18 years:

– The HAS recommends replacing the current vaccination schedule with the PCV20 administration schedule;
– The HAS recommends a single dose of PCV20, regardless of previous vaccination with a pneumococcal vaccine, with a minimum interval of 8 weeks following the last dose of a pneumococcal vaccine, in accordance with the marketing authorisation.

The HAS recommends the use of PCV20 in infants and children at risk of PD;

The HAS recommends discontinuing the use of PCV13, PCV15 and PPSV23 in children at risk;

The PCV20 vaccine may be administered alongside other vaccines recommended for these age groups.

The PCV21 vaccine is the preferred choice for adults at risk and those aged 65 and over.

For adults aged 18 to 64 who are at risk of pneumococcal infection:

– The HAS recommends that adults aged 18 to 64 at risk of pneumococcal infection, including welders regularly exposed to welding fumes and metalworkers, should be vaccinated with a single dose of PCV21, in accordance with the marketing authorisation;

For adults aged 65 and over:

– The HAS recommends that adults aged 65 and over be vaccinated with a single dose of PCV21, in accordance with the marketing authorisation.
– The HAS recommends the preferential use of PCV21 in adults;
– To date, no sequential vaccination schedule combining PCV20 and PCV21 has been studied.

At this stage, the HAS does not comment on the appropriateness or necessity of repeat vaccination following the single dose, in accordance with its marketing authorisation;

PCV21 may be administered concurrently with other vaccines recommended for this age group.

Table 1 summarises the HAS recommendations on vaccination against pneumococcal infections.

Table 1. Summary of the HAS's recommendations on vaccination against pneumococcal infections.

Age group	Recommended vaccine	Vaccination schedule
Infants		
Infants (from 8 weeks) and preterm infants (< 37 weeks)	PCV20	3+1 schedule: 3 primary doses (at 2, 4 and 6 months) + 1 booster dose at 11 months
Children at risk		
Children at risk (15 months to < 5 years)	PCV20	Single dose. Allow an interval of 8 weeks after the last dose of a previous pneumococcal conjugate vaccine
Children at risk (5 years to < 18 years)	PCV20	Single dose. Allow an interval of 8 weeks after the last dose of a pneumococcal vaccine
Unvaccinated infants and children		
Unvaccinated infants (7 to < 12 months)	PCV20	2 doses (interval ≥ 4 weeks) + 1 booster dose during the second year
Unvaccinated infants (12 to < 24 months)	PCV20	2 doses (interval ≥ 8 weeks)
Unvaccinated children at risk (2 to < 5 years)	PCV20	Single dose
Adults		
Adults at risk (18 to 64 years)	PCV21	Single dose
Adults (65 years and over)	PCV21	Single dose

The HAS recommends that infants who have started a vaccination schedule with PCV13 or PCV15 should continue with PCV20 according to the PCV20 schedule (at 2, 4, 6 and 11 months).

The HAS does not propose a catch-up schedule for adults who have previously been vaccinated with PCV20. For immunocompromised individuals, a specific recommendation is currently being drawn up by the French-speaking Society for Infectious Diseases (SPILF).

The HAS states that the vaccination strategy against pneumococcal infections will be updated in line with changes in the epidemiological situation, advances in scientific knowledge, and marketing authorisations or extensions of indications for pneumococcal vaccines.

The HAS encourages the assessment of the overall impact of the vaccination strategy against pneumococcal infections by conducting surveys to evaluate vaccination coverage among infants, at-risk children, at-risk adults and adults aged 65 and over. The HAS also encourages surveillance networks and researchers to carry out assessments of the impact of the vaccination strategy aimed at reducing the impact of the disease in hospital settings and within the community.

The HAS also calls for an assessment of the duration of protection offered by all vaccines against pneumococcal infections recommended for all age groups, to determine the appropriateness of future booster doses, as well as co-administration with other recommended vaccinations in accordance with the immunisation schedule.