

## PREVNAR 20™

### 1. NAME OF THE MEDICINAL PRODUCT

#### 1.1. Product Name

Prevnar 20

#### 1.2. Strength

0.5 mL

#### 1.3. Pharmaceutical Dosage Form

Suspension for injection in pre-filled syringe

### 2. QUALITATIVE AND QUANTITATIVE COMPOSITION

#### 2.1. Qualitative Declaration

Pneumococcal polysaccharide conjugate vaccine (20-valent, adsorbed)

#### 2.2. Quantitative Declaration

One dose (0.5 mL) contains:

Pneumococcal polysaccharide serotype 1 <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 3 <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 4 <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 5 <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 6A <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 6B <sup>1,2</sup>	4.4 µg
Pneumococcal polysaccharide serotype 7F <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 8 <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 9V <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 10A <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 11A <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 12F <sup>1,2</sup>	2.2 µg

Pneumococcal polysaccharide serotype 14 <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 15B <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 18C <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 19A <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 19F <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 22F <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 23F <sup>1,2</sup>	2.2 µg
Pneumococcal polysaccharide serotype 33F <sup>1,2</sup>	2.2 µg

<sup>1</sup>Conjugated to CRM<sub>197</sub> carrier protein (approximately 51 µg per dose)

<sup>2</sup>Adsorbed on aluminium phosphate (0.125 mg aluminium per dose)

For the full list of excipients, see section 6.1.

### 3. PHARMACEUTICAL FORM

Suspension for injection.

The vaccine is a homogeneous white suspension.

### 4. CLINICAL PARTICULARS

#### 4.1. Therapeutic indications

Active immunisation for the prevention of invasive disease, pneumonia, and acute otitis media caused by *Streptococcus pneumoniae* in infants, children, and adolescents from 6 weeks to less than 18 years of age.

Active immunisation for the prevention of invasive disease and pneumonia caused by *Streptococcus pneumoniae* in individuals 18 years of age and older.

See sections 4.4 and 5.1 for information on protection against specific pneumococcal serotypes.

**Prevnar 20** should be used in accordance with official recommendations.

#### 4.2. Posology and method of administration

##### Posology

It is recommended that infants who receive a first dose of **Prevnar 20** complete the vaccination course with **Prevnar 20**.

<b>Vaccination schedule in infants and children 6 weeks to 15 months of age</b>	
<i>4-dose series (three-dose primary series followed by a booster dose)</i>	The primary infant series consists of three doses, each of 0.5mL, with the first dose usually given at 2 months of age and with an interval of at least 4 weeks between doses. The first dose may be given as early as 6 weeks of age. The fourth (booster) dose is recommended between 11 and 15 months of age (see section 5.1).
<b>Vaccination schedule for individuals 18 years of age and older</b>	
<i>Individuals 18 years of age and older</i>	<p><b>Pprevnar 20</b> is to be administered as a single dose to individuals 18 years of age and older.</p> <p>The need for revaccination with a subsequent dose of <b>Pprevnar 20</b> has not been established.</p> <p>No data on sequential vaccination with other pneumococcal vaccines or a booster dose are available for <b>Pprevnar 20</b>. Based on the clinical experience with Pprevnar 13 (a pneumococcal conjugate vaccine consisting of 13 polysaccharide conjugates that are also in <b>Pprevnar 20</b>), if the use of 23-valent pneumococcal polysaccharide vaccine (Pneumovax 23 [PPSV23]) is considered appropriate, <b>Pprevnar 20</b> should be given first (see section 5.1).</p>

### **Paediatric population**

No or only limited data are available for **Pprevnar 20** in infants below 6 weeks, preterm, older unvaccinated, or partially vaccinated infants and children (see sections 4.4, 4.8 and 5.1). The following dosing recommendations are predominantly based on experience with Pprevnar 13.

#### ***Infants below 6 weeks of age***

The safety and efficacy of **Pprevnar 20** in infants below 6 weeks have not been established. No data are available.

#### ***Preterm infants (less than 37 weeks of gestation)***

The recommended immunisation series for **Pprevnar 20** consists of four doses, each of 0.5 mL. The primary infant series consists of three doses, with the first dose given at 2 months of age and

with an interval of at least 4 weeks between doses. The first dose may be given as early as 6 weeks of age. The fourth (booster) dose is recommended between 11 and 15 months of age (see sections 4.4 and 5.1).

***Unvaccinated infants 7 months to less than 12 months of age***

Two doses, each of 0.5 mL, with an interval of at least 4 weeks between doses. A third dose is recommended in the second year of life.

***Unvaccinated children 12 months to less than 24 months of age***

Two doses, each of 0.5 mL, with an interval of at least 8 weeks between doses.

***Unvaccinated children 2 years to less than 5 years of age***

One single dose of 0.5 mL.

***Children 15 months to less than 5 years of age previously fully vaccinated with Prevnar 13***

One single dose (0.5 mL) given on an individual basis according to official recommendations to elicit immune responses to the additional serotypes.

If Prevnar 13 was administered, at least 8 weeks should elapse before administering **Prevnar 20** (see section 5.1).

***Children and adolescents 5 years to less than 18 years of age regardless of prior Prevnar 13 vaccination***

One single dose (0.5 mL) given on an individual basis according to official recommendations.

If Prevnar 13 was administered, at least 8 weeks should elapse before administering **Prevnar 20** (see section 5.1).

**Special populations**

There are no data with **Prevnar 20** in special populations.

Experience from clinical studies with Prevnar 13 (a pneumococcal conjugate vaccine consisting of 13 polysaccharide conjugates that are also in **Prevnar 20**) are available in children and adults at higher risk of pneumococcal infection including immunocompromised children and adults with

human immunodeficiency virus (HIV) infection or haematopoietic stem cell transplant (HSCT), and children with sickle cell disease (SCD) (see sections 4.4 and 5.1).

Based on these data, the following posology was recommended for Prevnar 13:

- Individuals at higher risk of pneumococcal infection (e.g., individuals with SCD or HIV infection), including those previously vaccinated with 1 or more doses of PPSV23, were recommended to receive at least 1 dose of Prevnar 13.
- In individuals with a HSCT, the recommended immunisation series with Prevnar 13 consisted of 4 doses of 0.5 mL each. The primary series consisted of 3 doses, with the first dose given 3 to 6 months after HSCT and with an interval of at least 4 weeks between doses. A booster dose was recommended 6 months after the third dose (see section 5.1).

The recommended dosing of Prevnar 13 may be considered in guiding vaccination with **Prevnar 20** in high-risk populations. For information on responses to pneumococcal vaccines in immunocompromised individuals, please also refer to sections 4.4. and 5.1.

#### **Method of administration**

For intramuscular use only.

The vaccine (0.5 mL) should be given by intramuscular injection. The preferred sites are the anterolateral aspect of the thigh (vastus lateralis muscle) in infants or the deltoid muscle of the upper arm in children and adults. **Prevnar 20** should be administered with care to avoid injection into or near nerves and blood vessels.

For instructions on the handling of the vaccine before administration, see section 6.6.

#### **4.3. Contraindications**

Hypersensitivity to the active substances, to any of the excipients listed in section 6.1, or to diphtheria toxoid.

#### **4.4. Special warnings and precautions for use**

Do not inject **Prevnar 20** intravascularly.

#### **Traceability**

In order to improve the traceability of biological medicinal products, the name and the batch

number of the administered product should be clearly recorded.

### **Hypersensitivity**

As with all injectable vaccines, appropriate medical treatment and supervision must always be readily available in case of a rare anaphylactic reaction following the administration of the vaccine.

### **Concurrent illness**

Vaccination should be postponed in individuals suffering from acute severe febrile illness.

However, the presence of a minor infection, such as a cold, should not result in the deferral of vaccination.

### **Thrombocytopenia and coagulation disorders**

The vaccine must be administered with caution to individuals with thrombocytopenia or a bleeding disorder since bleeding may occur following an intramuscular administration.

The risk of bleeding in patients with coagulation disorders needs to be carefully evaluated before intramuscular administration of any vaccine, and subcutaneous administration should be considered if the potential benefit clearly outweighs the risks.

### **Protection against pneumococcal disease**

**Prevnar 20** may only protect against *Streptococcus pneumoniae* serotypes included in the vaccine and will not protect against other microorganisms that cause invasive disease, pneumonia or otitis media (OM). As with any vaccine, **Prevnar 20** may not protect all individuals receiving the vaccine from invasive pneumococcal disease (IPD), pneumonia or OM. For the most recent epidemiological information in your country, you should consult with the relevant national organisation.

### **Immunocompromised individuals**

Safety and immunogenicity data on **Prevnar 20** are not available for individuals in immunocompromised groups. Vaccination should be considered on an individual basis.

Based on experience with pneumococcal vaccines, some individuals with altered immunocompetence may have reduced immune responses to **Prevnar 20**.

Individuals with impaired immune response, whether due to the use of immunosuppressive

therapy, a genetic defect, HIV infection, or other causes, may have reduced antibody response to active immunisation. The clinical relevance of this is unknown.

Safety and immunogenicity data with Prevnar 13 (a pneumococcal conjugate vaccine consisting of 13 polysaccharide conjugates that are also in **Prevnar 20**) are available for individuals with HIV infection, SCD or with a HSCT (see sections 4.8 and 5.1). **Prevnar 20** should be used in accordance with official recommendations.

In adults across all studied age groups, formal non-inferiority criteria were met although numerically lower geometric mean titres (GMTs) were observed with **Prevnar 20** for most of the serotypes compared to Prevnar 13 (see section 5.1). In children, numerically lower immunoglobulin G (IgG) geometric mean concentrations (GMCs) were observed for all shared serotypes compared with Prevnar 13 (see section 5.1). The clinical relevance of these observations for immunocompromised individuals are unknown.

### **Paediatric population**

The potential risk of apnoea and the need for respiratory monitoring for 48 to 72 h should be considered when administering the primary immunisation series to very premature infants (born less than or equal to 28 weeks of gestation), and particularly for those with a previous history of respiratory immaturity. As the benefit of vaccination is high in this group of infants, vaccination should not be withheld or delayed.

### **Excipient**

This medicinal product contains less than 1 mmol sodium (23 mg) per dose, that is to say essentially 'sodium free'.

## **4.5. Interaction with other medicinal products and other forms of interaction**

Different injectable vaccines should always be administered at different vaccination sites.

Do not mix **Prevnar 20** with other vaccines or medicinal products in the same syringe.

### **Paediatric population**

In infants and children 6 weeks to less than 5 years of age, **Prevnar 20** can be administered concomitantly with any of the following vaccine antigens, either as monovalent or combination vaccines: diphtheria, tetanus, acellular pertussis, hepatitis B, *Haemophilus influenzae* type b,

inactivated poliomyelitis, measles, mumps, rubella, and varicella vaccines. In clinical trials, rotavirus vaccines were permitted to be administered concomitantly with **Prevnar 20** and no safety concerns were observed.

#### **Individuals 18 years of age and older**

**Prevnar 20** may be administered concomitantly with seasonal influenza vaccine (QIV; surface antigen, inactivated, adjuvanted). In subjects with underlying conditions associated with a high risk of developing life-threatening pneumococcal disease, consideration may be given to separating administrations of QIV and **Prevnar 20** (e.g., by approximately 4 weeks). In a double-blind, randomised study (B7471004) in adults 65 years of age and older, the immune response was formally non-inferior, however numerically lower titres were observed for all pneumococcal serotypes included in **Prevnar 20** when given concomitantly with seasonal influenza vaccine (QIV, surface antigen, inactivated, adjuvanted) compared to when **Prevnar 20** was given alone. The clinical relevance of this finding is unknown.

**Prevnar 20** can be administered concomitantly with COVID-19 mRNA vaccine (nucleoside modified).

There are no data on the concomitant administration of **Prevnar 20** with other vaccines.

#### **4.6. Fertility, pregnancy and lactation**

##### **Pregnancy**

There are no data on the use of **Prevnar 20** in pregnant women.

Animal studies do not indicate direct or indirect harmful effects with respect to reproductive toxicity.

Administration of **Prevnar 20** in pregnancy should only be considered when the potential benefits outweigh any potential risks for the mother and foetus.

##### **Breast-feeding**

It is unknown whether **Prevnar 20** is excreted in human milk.

##### **Fertility**

No human data on the effect of **Prevnar 20** on fertility are available. Animal studies do not



indicate direct or indirect harmful effects with respect to female fertility (see section 5.3).

#### **4.7. Effects on ability to drive and use machines**

**Prevnar 20** has no or negligible influence on the ability to drive and use machines. However, some of the effects mentioned under section 4.8 may temporarily affect the ability to drive or use machines.

#### **4.8. Undesirable effects**

##### **Summary of the safety profile**

##### ***Paediatric population***

The safety of **Prevnar 20** was evaluated in 5,987 participants 6 weeks of age to less than 18 years of age, in five clinical trials (one Phase 2 and four Phase 3), four randomised, double-blind, active-controlled clinical trials and one single-arm clinical trial; 3,664 participants received at least 1 dose of **Prevnar 20** and 2,323 participants received Prevnar 13 (control vaccine).

##### **Participants 6 weeks to less than 15 months of age**

Clinical trials were conducted in healthy infants 6 weeks to less than 15 months of age using a 3-dose schedule or a 4-dose schedule (see section 5.1). In these infant trials, 5,156 participants received at least 1 dose of vaccine: 2,833 received **Prevnar 20** and 2,323 received Prevnar 13. Overall, approximately 90% of participants in each group received all doses through the study-specified toddler dose. In all studies, local reactions and systemic events were collected after each dose, and adverse events (AEs) were collected in all studies from the first dose through 1 month after the last infant vaccination and from the toddler dose through 1 month after the toddler dose. Serious adverse events were evaluated through 1 month after the last dose in the Phase 3 trial B7471012 (Study 1012) and through 6 months after the last dose in Phase 3 trials (Studies 1011, 1013) and Phase 2 trial (Study 1003).

**Prevnar 20** was well tolerated when administered in a 3-dose and a 4-dose series, in the infant study populations with low rates of severe local reactions and systemic events, and most reactions resolving within 1 to 3 days. The percentages of participants with local reactions and systemic events after **Prevnar 20** were generally similar to those after Prevnar 13. The most frequently reported local reactions and systemic events after any dose of **Prevnar 20** were irritability, drowsiness, and pain at injection site. In these studies, **Prevnar 20** was co-administered or permitted to be administered with certain routine paediatric vaccines (see section 4.5).

Study 1012 was a pivotal, double-blind, randomised, active-controlled Phase 3 trial, in which 601 healthy infants received **Pprevnar 20** in a 3-dose series. The most frequently reported (> 10%) adverse reactions after any dose of **Pprevnar 20** were irritability (71.0% to 71.9%), drowsiness/increased sleep (50.9% to 61.2%), pain at injection site (22.8% to 42.4%), decreased appetite (24.7% to 39.3%), redness at the injection site (25.3% to 36.9%), swelling at the injection site (21.4% to 29.8%), and fever  $\geq 38.0^{\circ}\text{C}$  (8.9% to 24.3%). Most adverse reactions occurred within 1 to 2 days following vaccination and were mild or moderate in severity and of short duration (1 to 2 days).

Studies 1011, 1013 and 1003, were double-blind, randomised, active-controlled trials that included 2,232 healthy infants, vaccinated with **Pprevnar 20** in a 4-dose series. The most frequently reported (> 10%) adverse reactions observed after any dose of **Pprevnar 20** in infants were irritability (58.5% to 70.6%), drowsiness/increased sleep (37.7% to 66.2%), pain at injection site (32.8% to 45.5%), decreased appetite (23.0% to 26.4%), redness at the injection site (22.6% to 24.5%), and swelling at the injection site (15.1% to 17.6%). Most adverse reactions were mild or moderate following vaccination and most reactions resolving within 1 to 3 days. Severe reactions were reported infrequently.

In Study 1013, the local reactions and systemic events in the preterm subgroup (111 infants born at 34 to less than 37 weeks of gestation) were similar to or lower than the term infants in the study. In the preterm subgroup the frequency of any reported local reaction was 31.7% to 55.3% in the **Pprevnar 20** group, and any systemic event was 65.0% to 85.5% in the **Pprevnar 20** group.

#### Participants aged 15 months to less than 18 years of age

In the Phase 3 trial B7471014 (Study 1014), 831 participants 15 months to less than 18 years of age received a single dose of **Pprevnar 20** in four age groups (209 participants 15 to less than 24 months of age; 216 participants 2 years to less than 5 years of age; 201 participants 5 years to less than 10 years age; and 205 participants 10 years to less than 18 years of age). The participants less than 5 years of age had received at least 3 prior doses of **Pprevnar 13**.

The most frequently reported (> 10%) adverse reactions observed after any dose of **Pprevnar 20** in participants less than 2 years of age were irritability (61.8%), pain at the injection site (52.5%), drowsiness/increased sleep (41.7%), redness at the injection site (37.7%), decreased appetite (25.0%), swelling at the injection site (22.1%), and fever  $\geq 38.0^{\circ}\text{C}$  (11.8%). In participants aged 2 years and older, the most frequently reported adverse reactions were pain at the injection site

(66.0% to 82.9%), muscle pain (26.5% to 48.3%), redness at the injection site (15.1% to 39.1%), fatigue (27.8% to 37.2%), headache (5.6% to 29.3%), and swelling at the injection site (15.6% to 27.1%).

### ***Participants 18 years of age and older***

The safety of **Prevnar 20** was evaluated in 4,552 participants 18 years of age and older in six clinical trials (two Phase 1, one Phase 2, and three Phase 3), and 2,496 participants in the control groups.

In the Phase 3 trials, 4,263 participants received **Prevnar 20**. This included 1,798 participants 18 through 49 years of age, 334 participants 50 through 59 years of age, and 2,131 participants 60 years of age and older (1,138 were 65 years of age and older). Of the participants who received **Prevnar 20** in the Phase 3 trials, 3,639 were naïve to pneumococcal vaccines, 253 had previously received Pneumovax 23 (pneumococcal polysaccharide vaccine [23-valent]; PPSV23) ( $\geq 1$  to  $\leq 5$  years prior to enrollment), 246 had previously received Prevnar 13 only ( $\geq 6$  months prior to enrollment), and 125 had previously received Prevnar 13 followed by PPSV23 (the dose of PPSV23  $\geq 1$ -year prior to enrollment).

Participants in the Phase 3 trial B7471007 (Pivotal Study 1007) were evaluated for adverse events for 1 month after vaccination, and serious adverse events through 6 months after vaccination. This study included 447 participants 18 to 49 years of age, 445 participants 50 to 59 years of age, 1,985 participants 60 to 64 years of age, 624 participants 65 to 69 years of age, 319 participants 70 to 79 years of age, and 69 participants  $\geq 80$  years of age.

In participants 18 to 49 years of age in Studies 1007 and a Phase 3 trial B7471008 (Lot Consistency Study 1008), the most frequently reported adverse reactions were pain at injection site (79.2%), muscle pain (62.9%), fatigue (46.7%), headache (36.7%), and joint pain (16.2%). In participants 50 to 59 years of age in Study 1007, the most frequently reported adverse reactions were pain at injection site (72.5%), muscle pain (49.8%), fatigue (39.3%), headache (32.3%), and joint pain (15.4%). In participants  $\geq 60$  years of age in Study 1007, the most frequently reported adverse reactions were pain at injection site (55.4%), muscle pain (39.1%), fatigue (30.2%), headache (21.5%), and joint pain (12.6%). These were usually mild or moderate in intensity and resolved within a few days after vaccination.

Phase 3 Study B7471006 (Study 1006) evaluated **Prevnar 20** in participants  $\geq 65$  years of age

with varying prior pneumococcal status (prior PPSV23, prior Prevnar 13 or prior Prevnar 13 followed by PPSV23). In this study, the most frequently reported adverse reactions for participants were similar in frequency to those described for participants  $\geq 60$  years of age in Study 1007, with slightly higher injection site pain (61.2%) in participants with prior Prevnar 13, and joint pain (16.8%) in participants with prior Prevnar 13 followed by PPSV23.

#### **Tabulated list of adverse reactions**

Tabulated lists of adverse reactions from the infant Phase 2, Phase 3 clinical trials in paediatric and adult populations, and post-marketing experience are presented below (Table 1).

#### ***Adverse reactions from clinical trials***

As **Prevnar 20** contains the same 13 serotype-specific capsular polysaccharide conjugates and the same vaccine excipients as Prevnar 13, the adverse reactions already identified for Prevnar 13 have been adopted for **Prevnar 20**. Table 1 presents adverse reactions reported in the Phase 2 infant trial, and the Phase 3 trials in paediatric and adult populations, based on the highest frequency among adverse reactions, local reactions, or systemic events, after vaccination in an **Prevnar 20** group or integrated dataset. The data from clinical trials in infants reflect **Prevnar 20** administered simultaneously with other routine childhood vaccines.

Adverse reactions are listed by system organ class in decreasing order of frequency and seriousness. The frequency is defined as follows: very common ( $\geq 1/10$ ), common ( $\geq 1/100$  to  $< 1/10$ ), uncommon ( $\geq 1/1,000$  to  $< 1/100$ ), rare ( $\geq 1/10,000$  to  $< 1/1,000$ ), very rare ( $< 1/10,000$ ), not known (cannot be estimated from available data).

**Table 1. Tabulated Adverse Reactions from Prevnar 20 Clinical Trials**

System Organ Class	Adverse Reactions	Frequency		
		Infants/Children/Adolescents		Adults
		6 weeks to less than 5 years of age	5 years to less than 18 years of age	
Immune System Disorders	Hypersensitivity reaction including face oedema, dyspnoea, bronchospasm	Rare <sup>a</sup>	-	Uncommon

Metabolism and Nutrition Disorders	Decreased appetite	Very common	Very common <sup>a</sup>	Very common <sup>a</sup>
Psychiatric Disorders	Irritability	Very common	Very common <sup>a</sup>	-
	Crying	Uncommon <sup>a</sup>	-	-
Nervous System Disorders	Drowsiness/increased sleep	Very common	Very common <sup>a</sup>	-
	Seizures (including febrile seizures)	Uncommon	-	-
	Hypotonic-hyporesponsive episode	Rare <sup>a</sup>	-	-
	Restless sleep/decreased sleep	Very common <sup>a</sup>	Very common <sup>a</sup>	-
	Headache	-	Very common	Very common
Gastrointestinal Disorders	Diarrhoea	Common	Common <sup>a</sup>	Uncommon <sup>b</sup>
	Nausea	-	-	Uncommon
	Vomiting	Common	Common <sup>a</sup>	Uncommon <sup>b</sup>
Skin and Subcutaneous Tissue Disorders	Rash	Common	Common <sup>a</sup>	Uncommon <sup>b</sup>
	Angioedema	-	-	Uncommon
	Urticaria or urticaria-like rash	Uncommon	Uncommon	-
Musculoskeletal and connective tissue Disorders	Muscle pain	-	Very common	Very common
	Joint pain	-	Common	Very common
General Disorders and Administration Site Conditions	Fever (pyrexia)	Very common	Uncommon	Common
	Fever greater than 38.9°C	Common	-	-
	Fatigue	-	Very common	Very common
	Vaccination-site erythema	Very common	Very common	Common <sup>b</sup>
	Vaccination-site induration/swelling	Very common	Very common	Common <sup>b</sup>

	Vaccination-site erythema or induration/swelling (>2.0-7.0 cm)	Very common (after toddler dose and in older children [age 2 to <5 years])	-	-
		Common (after infant series)	-	-
	Vaccination-site erythema or induration/swelling (> 7.0 cm)	Uncommon	-	-
	Vaccination-site pain/tenderness	Very common	Very common	Very common
	Vaccination-site pain/tenderness causing limitation of limb movement	Common	Common	Very common <sup>a</sup>
	Vaccination-site pruritus	-	-	Uncommon
	Lymphadenopathy	-	-	Uncommon
	Vaccination-site urticaria	-	-	Uncommon
	Chills	-	-	Uncommon <sup>b</sup>
	Vaccination-site hypersensitivity	Rare <sup>c</sup>	-	-

- a. These frequencies are based on adverse reactions (ARs) reported in clinical trials with **Prevnam 13** as these ARs were not reported in **Prevnam 20** trials of infants (Phase 2 and 3), children and adolescents less than 18 years of age, and adults 18 years and older (Phase 3) therefore, the frequency is not known.
- b. Event reported from clinical trials in adults with **Prevnam 13** with very common frequency ( $\geq 1/10$ ).
- c. AR not reported for **Prevnam 13**, although injection-site urticaria, injection-site pruritus, and injection-site dermatitis were reported in **Prevnam 13** post-marketing experience.

### ***Safety with concomitant vaccine administration in adults***

When **Prevnam 20** was administered to adults aged  $\geq 65$  years together with the third (booster) dose of a COVID-19 mRNA vaccine (nucleoside modified), the tolerability profile generally resembled that of the COVID-19 mRNA vaccine (nucleoside modified) administered alone. There were a few differences in the safety profile when compared to administration of **Prevnam 20** alone. In the phase 3 trial B7471026 (Study 1026), pyrexia (13.0%) and chills (26.5%) were reported as

“very common” with co-administration. There was also one report of dizziness (0.5%) in the co-administration group.

### ***Adverse reactions from post-marketing experience***

Table 2 includes adverse experiences that have been spontaneously reported during the post-marketing use of Prevnar 13 in paediatric and adult populations, which may also occur with **Prevnar 20**. The post-marketing safety experience with Prevnar 13 is relevant to **Prevnar 20**, as **Prevnar 20** contains all components (polysaccharide conjugates and excipients) of Prevnar 13. These events were reported voluntarily from a population of uncertain size. Therefore, it is not possible to reliably estimate their frequency or to establish, for all events, a causal relationship to vaccine exposure.

**Table 2. Adverse Reactions from Prevnar 13 Post-marketing Experience**

<b>System Organ Class</b>	<b>Frequency Not Known</b>
Blood and lymphatic system disorders	Lymphadenopathy localised to the region of the vaccination site
Immune system disorders	Anaphylactic/anaphylactoid reaction, including shock
Skin and subcutaneous tissue disorders	Angioedema, Erythema multiforme
General disorders and administration site conditions	Vaccination-site dermatitis, Vaccination-site urticaria, Vaccination-site pruritus

Events reported spontaneously in Prevnar 13 post-marketing experience; therefore, the frequencies could not be estimated from the available data and are considered as not known.

### ***Additional information in special populations in studies with Prevnar 13***

Participants 6 to <18 years of age with HIV infection have similar frequencies of adverse reactions in Table 1, except fever (11% to 19%), joint pain (24% to 42%), and vomiting (8% to 18%), which were very common. Participants  $\geq$  18 years of age with HIV infection have similar frequencies of adverse reactions in Table 1, except for pyrexia (5% to 18%) and vomiting (8% to 12%) which were very common and nausea (< 1% to 3%) which was common.

Participants 2 to <18 years of age with HSCT have similar frequencies of adverse reactions in Table 1, except vaccination-site pain causing limitation of limb movement (5% to 15%), vomiting (6% to 21%), diarrhoea (15% to 32%), and joint pain (25% to 32%), which were very common. Participants  $\geq$  18 years of age with an HSCT have similar frequencies of adverse reactions in

Table 1, except for pyrexia (4% to 15%), vomiting (6% to 21%), and diarrhoea (25% to 36%) which were very common.

Participants 6 to <18 years of age with SCD have similar frequencies of adverse reactions in Table 1, except vaccination-site pain causing limitation of limb movement (11% to 16%), fever (21% to 22%), vomiting (13% to 15%), diarrhoea (13% to 25%), and joint pain (40% to 45%) which were very common.

#### **4.9. Overdose**

Overdose with **Pprevnar 20** is unlikely due to its presentation as a pre-filled syringe (1 dose).

### **5. PHARMACOLOGICAL PROPERTIES**

#### **5.1. Pharmacodynamic properties**

Pharmacotherapeutic group: vaccines, pneumococcal vaccines; ATC code: J07AL02

##### **Mechanism of action**

**Pprevnar 20** contains 20 pneumococcal capsular polysaccharides all conjugated to CRM<sub>197</sub> carrier protein, which modifies the immune response to the polysaccharide from a T-cell independent response to a T-cell dependent response. The T-cell dependent response leads to an enhanced antibody response and induced functional antibodies (associated with opsonisation, phagocytosis and killing of pneumococci) to protect against pneumococcal disease, as well as the generation of memory B cells, allowing for an anamnestic (booster) response on re-exposure to the bacterium.

Immune responses in children and adults, after exposure to *Streptococcus pneumoniae* or following pneumococcal vaccination, can be determined by measuring IgG or opsonophagocytic activity (OPA) responses. OPA measures functional antibody activity and is considered to be an important immunologic surrogate measure of protection against pneumococcal disease in adults. In children, multiple immunogenicity criteria are used for the clinical evaluation of pneumococcal conjugate vaccines including the proportion of vaccinated children achieving a serotype-specific IgG antibody level corresponding to  $\geq 0.35$  µg/mL using the WHO enzyme linked immunosorbent assay (ELISA) or an equivalent assay-specific value. Serotype-specific immune responses that correlate with individual protection against pneumococcal disease have not been clearly defined.

##### **Clinical efficacy**

No efficacy studies have been performed with **Pprevnar 20**.



## Immunogenicity data

### ***Prevnar 20 clinical trials in infants, children and adolescents***

Immunogenicity was assessed by serotype-specific IgG response rates (the proportion of participants meeting the serotype-specific IgG level of  $\geq 0.35$   $\mu\text{g/mL}$  or equivalent assay-specific value) and IgG GMCs at 1 month following the primary series and 1 month following the toddler dose. OPA GMTs were also measured 1 month following the primary series and following the toddler dose. The predefined concentration corresponding to 0.35  $\mu\text{g/mL}$  in the WHO ELISA (or equivalent assay-specific threshold value) is only applicable at the population level and cannot be used to predict individual or serotype-specific protection against IPD. No correlate of protection exists for pneumonia and acute otitis media (AOM).

Two Phase 3 clinical trials (Study 1011, Study 1012) and one Phase 2 clinical trial (Study 1003) evaluated the immunogenicity of **Prevnar 20** in a 3-dose or a 4-dose series in infants. One Phase 3 Study B7471027 (Study 1027) evaluated the immunogenicity of a single booster dose or 2 doses of **Prevnar 20** in toddlers 12 months to less than 24 months of age after 2 prior infant doses of Prevnar 13. One Phase 3 study (Study 1014) of children 15 months to less than 18 years of age evaluated a single dose of **Prevnar 20**.

### *Immune responses following 3 and 4 doses in a 4-dose infant vaccination series*

In Study 1011, conducted in the United States and Puerto Rico, 1,991 healthy infants aged 2 months ( $\geq 42$  to  $\leq 98$  days) at the time of consent and born at  $> 36$  weeks of gestation, were randomised (1:1) and vaccinated with either **Prevnar 20** or Prevnar 13 at approximately 2, 4, 6, and 12 to 15 months of age. Participants also received other paediatric vaccines including a combination vaccine containing diphtheria, tetanus, pertussis (acellular), hepatitis B (rDNA), poliomyelitis (inactivated), and a *Haemophilus influenzae* type b conjugate vaccine (adsorbed) with all 3 doses, and measles, mumps, rubella combination vaccine, and varicella vaccine at the toddler dose. Rotavirus and influenza vaccines were permitted to be co-administered in the study.

One month after the third infant dose, NI for the difference in percentages of participants with specified serotype-specific IgG concentrations (with a 10% NI criterion) was met for 9 of the 13 matched serotypes and missed for 4 serotypes (serotypes 3, 4, 9V, and 23F) (Table 3). Six of the 7 additional serotypes also met the non-inferiority criterion when compared to the lowest result for a vaccine serotype in the Prevnar 13 group (excluding serotype 3); serotype 12F missed the statistical non-inferiority criterion. IgG GMCs 1 month after Dose 3 of **Prevnar 20** were non-inferior

(with a 0.5 NI criterion for IgG geometric mean ratio (GMR)) to those in the Prevnar 13 group for all 13 matched serotypes. The NI criterion was also met for the 7 additional serotypes to the lowest IgG GMC (excluding serotype 3) among the vaccine serotypes in the Prevnar 13 group (Table 3).

The antibody levels for all 7 additional serotypes were significantly higher than the corresponding serotype in the Prevnar 13 group (Tables 3 and 4).

One month after the toddler dose, NI for IgG GMCs (with a 0.5 NI criterion for IgG GMR) was met for all 13 matched serotypes. The NI criterion was also met for the 7 additional serotypes to the lowest IgG GMC (excluding serotype 3) among the vaccine serotypes in the Prevnar 13 group (Table 4). Although non-inferiority was not formally tested for this endpoint, the observed differences (**Prevnar 20** – Prevnar 13) in percentages of participants with specified serotype-specific IgG concentrations 1 month after Dose 4 were greater than -10% for all 13 matched serotypes except serotype 3 (-16.4%, CI -21.0%, -11.8%). For the 7 additional serotypes, the observed differences in percentage of participants with specified serotype-specific IgG concentrations 1 month after Dose 4 ranged from -11.5% (serotype 12F) to 1.8% (serotype 15B, 22F, and 33F) (Table 4).

**Table 3. Percentage of Participants with Specified Pneumococcal IgG Concentrations and Pneumococcal IgG GMCs (µg/mL) One Month After Dose 3 of a 4-Dose Series, Study 1011<sup>a</sup>**

	Percentages of Participants with Specified IgG Concentrations <sup>b</sup>			IgG GMCs		
	Prevnar 20 N <sup>c</sup> = 831-833	Prevnar 13 N <sup>c</sup> = 801-802	Difference (Prevnar 20 – Prevnar 13)	Prevnar 20 N <sup>c</sup> = 831-833	Prevnar 13 N <sup>c</sup> = 801-802	Prevnar 20 /Prevnar 13
	%	%	% (95% CI <sup>d</sup> )	GMC <sup>e</sup>	GMC <sup>e</sup>	GMR (95% CI <sup>e</sup> )
	<b>Serotypes</b>					
1	84.9	91.1	-6.3 (-9.4, -3.1)	0.74	1.14	0.65 (0.59, 0.72)
3	40.5	55.2	-14.8 (-19.5, -10.0)	0.36	0.51	0.70 (0.64, 0.76)
4	78.2	87.5	-9.4 (-13.0, -5.8)	0.75	1.08	0.70 (0.63, 0.78)

**Table 3. Percentage of Participants with Specified Pneumococcal IgG Concentrations and Pneumococcal IgG GMCs (µg/mL) One Month After Dose 3 of a 4-Dose Series, Study 1011<sup>a</sup>**

	Percentages of Participants with Specified IgG Concentrations <sup>b</sup>			IgG GMCs		
	Prevnar 20 N <sup>c</sup> = 831-833	Prevnar 13 N <sup>c</sup> = 801-802	Difference (Prevnar 20 – Prevnar 13)	Prevnar 20 N <sup>c</sup> = 831-833	Prevnar 13 N <sup>c</sup> = 801-802	Prevnar 20 /Prevnar 13
	%	%	% (95% CI <sup>d</sup> )	GMC <sup>e</sup>	GMC <sup>e</sup>	GMR (95% CI <sup>e</sup> )
5	86.2	90.5	-4.3 (-7.5, -1.2)	0.66	0.96	0.69 (0.61, 0.77)
6A	94.2	96.1	-1.9 (-4.0, 0.2)	1.95	2.69	0.72 (0.65, 0.81)
6B	88.3	92.4	-4.1 (-7.0, -1.2)	0.61	1.02	0.60 (0.51, 0.70)
7F	96.4	97.3	-0.9 (-2.6, 0.9)	1.71	2.29	0.75 (0.69, 0.81)
9V	80.3	88.8	-8.5 (-12.0, -5.0)	0.87	1.21	0.72 (0.65, 0.80)
14	94.2	95.4	-1.2 (-3.4, 1.0)	2.16	2.72	0.79 (0.71, 0.89)
18C	87.3	89.4	-2.1 (-5.3, 1.0)	1.31	1.71	0.77 (0.70, 0.84)
19A	96.3	98.0	-1.7 (-3.4, -0.1)	0.72	0.91	0.79 (0.72, 0.86)
19F	96.0	95.9	0.2 (-1.8, 2.1)	1.59	2.00	0.79 (0.73, 0.86)
23F	74.3	83.2	-8.9 (-12.8, -4.9)	0.82	1.25	0.66 (0.58, 0.75)
<b>Additional Serotypes<sup>f</sup></b>						
8	95.8	83.2 <sup>f</sup>	12.6 (9.8, 15.6)	1.80	0.91 <sup>g</sup>	1.98 (1.81, 2.16)
10A	88.0	83.2 <sup>f</sup>	4.8 (1.4, 8.3)	1.21	0.91 <sup>g</sup>	1.32 (1.18, 1.49)
11A	90.0	83.2 <sup>f</sup>	6.9	1.39	0.91 <sup>g</sup>	1.52

**Table 3. Percentage of Participants with Specified Pneumococcal IgG Concentrations and Pneumococcal IgG GMCs (µg/mL) One Month After Dose 3 of a 4-Dose Series, Study 1011<sup>a</sup>**

	Percentages of Participants with Specified IgG Concentrations <sup>b</sup>			IgG GMCs		
	Prevnar 20 N <sup>c</sup> = 831-833	Prevnar 13 N <sup>c</sup> = 801-802	Difference (Prevnar 20 – Prevnar 13)	Prevnar 20 N <sup>c</sup> = 831-833	Prevnar 13 N <sup>c</sup> = 801-802	Prevnar 20 /Prevnar 13
	%	%	% (95% CI <sup>d</sup> )	GMC <sup>e</sup>	GMC <sup>e</sup>	GMR (95% CI <sup>e</sup> )
			(3.6, 10.2)			(1.39, 1.67)
12F	48.0	83.2 <sup>f</sup>	-35.1 (-39.4, -30.8)	0.55	0.91 <sup>g</sup>	0.60 (0.54, 0.67)
15B	97.0	83.2 <sup>f</sup>	13.8 (11.1, 16.8)	4.40	0.91 <sup>g</sup>	4.82 (4.39, 5.30)
22F	98.7	83.2 <sup>f</sup>	15.5 (12.9, 18.3)	3.71	0.91 <sup>g</sup>	4.06 (3.68, 4.48)
33F	89.3	83.2 <sup>f</sup>	6.1 (2.8, 9.5)	1.49	0.91 <sup>g</sup>	1.64 (1.46, 1.83)

Abbreviations: CI = confidence interval; dLIA = Luminex-based direct immunoassay; ELISA = enzyme-linked immunosorbent assay; GMC = geometric mean concentration; GMR = geometric mean ratio; IgG = immunoglobulin G; LLOQ = lower limit of quantitation.

Note: Non-inferiority for a serotype was concluded if the lower bound of the 2-sided 95% CI for the percentage difference (**Prevnar 20** – Prevnar 13) was > -10% or the lower bound of the 2-sided 95% CI for the GMR (**Prevnar 20** to Prevnar 13) was >0.5 for that serotype.

Note: Assay results below the LLOQ were set to 0.5 × LLOQ in the analysis.

- Study 1011 was conducted in the United States and the territory of Puerto Rico (NCT04382326).
- Specified levels for the Prevnar 13 serotypes are from a published bridging study (Tan CY, et al. 2018) using results from after primary infant doses, before toddler dose, and after toddler dose (schedule of 3 infant doses followed by a toddler dose) except for serotype 19A, which used results from after primary infant doses only. For the additional 7 serotypes, specified levels are from a concordance evaluation (clinical dLIA to re-test ELISA) of data from a Phase 2 Study B7471003, which also uses the schedule of 3 infant doses followed by a toddler dose.
- N = Number of participants with valid IgG concentrations.
- Two-sided CI based on the Miettinen and Nurminen method.
- GMCs, GMRs and the associated 2-sided CIs were calculated by exponentiating the means and the mean differences (**Prevnar 20** – Prevnar 13) of the logarithm of the concentrations and the corresponding CIs (based on

**Table 3. Percentage of Participants with Specified Pneumococcal IgG Concentrations and Pneumococcal IgG GMCs (µg/mL) One Month After Dose 3 of a 4-Dose Series, Study 1011<sup>a</sup>**

	Percentages of Participants with Specified IgG Concentrations <sup>b</sup>			IgG GMCs		
	Prevnar 20 N <sup>c</sup> = 831-833	Prevnar 13 N <sup>c</sup> = 801-802	Difference (Prevnar 20 – Prevnar 13)	Prevnar 20 N <sup>c</sup> = 831-833	Prevnar 13 N <sup>c</sup> = 801-802	Prevnar 20 /Prevnar 13
	%	%	% (95% CI <sup>d</sup> )	GMC <sup>e</sup>	GMC <sup>e</sup>	GMR (95% CI <sup>e</sup> )
<p>the Student t distribution).</p> <p>f. For the percentage differences of the 7 additional serotypes, the IgG results from serotype 23F (Prevnar 13 serotype with the lowest percentage, excluding serotype 3) in the Prevnar 13 group was used in the comparisons for non-inferiority. Percentages of participants with specified IgG concentrations to serotypes 8, 10A, 11A, 12F, 15B, 22F and 33F in the Prevnar 13 group were 1.4%, 1.9%, 1.4%, 0.1%, 1.2%, 1.4% and 1.5%, respectively.</p> <p>g. For the GMRs of the 7 additional serotypes, the IgG results from serotype 19A (Prevnar 13 serotype with the lowest GMC, excluding serotype 3) in the Prevnar 13 group was used in the comparisons for non-inferiority. IgG GMCs to serotypes 8, 10A, 11A, 12F, 15B, 22F and 33F in the Prevnar 13 group were 0.02 µg/mL, 0.01 µg/mL, 0.02 µg/mL, 0.01 µg/mL, 0.03 µg/mL, 0.01 µg/mL and 0.02 µg/mL, respectively.</p>						

**Table 4. Percentage of Participants with Specified Pneumococcal IgG Concentrations and Pneumococcal IgG GMCs (µg/mL) One Month After Dose 4 of a 4-Dose Series, Study 1011<sup>a</sup>**

	Percentages of Participants with Specified IgG Concentrations <sup>b</sup>			IgG GMCs		
	Prevnar 20 N <sup>c</sup> = 753-755	Prevnar 13 N <sup>c</sup> = 744-745	Difference (Prevnar 20 – Prevnar 13)	Prevnar 20 N <sup>c</sup> = 753-755	Prevnar 13 N <sup>c</sup> = 744-745	Prevnar 20 /Prevnar 13
	%	%	% (95% CI <sup>d</sup> )	GMC <sup>e</sup>	GMC <sup>e</sup>	GMR (95% CI <sup>e</sup> )
<b>Serotypes</b>						
1	95.5	98.1	-2.6 (-4.5, -0.9)	1.47	2.12	0.69 (0.63, 0.76)
3	60.8	77.2	-16.4 (-21.0, -11.8)	0.56	0.85	0.66 (0.61, 0.73)
4	98.8	98.9	-0.1 (-1.3, 1.1)	3.77	4.84	0.78 (0.70, 0.86)

**Table 4. Percentage of Participants with Specified Pneumococcal IgG Concentrations and Pneumococcal IgG GMCs (µg/mL) One Month After Dose 4 of a 4-Dose Series, Study 1011<sup>a</sup>**

	Percentages of Participants with Specified IgG Concentrations <sup>b</sup>			IgG GMCs		
	Prevnar 20 N <sup>c</sup> = 753-755	Prevnar 13 N <sup>c</sup> = 744-745	Difference (Prevnar 20 – Prevnar 13)	Prevnar 20 N <sup>c</sup> = 753-755	Prevnar 13 N <sup>c</sup> = 744-745	Prevnar 20 /Prevnar 13
	%	%	% (95% CI <sup>d</sup> )	GMC <sup>e</sup>	GMC <sup>e</sup>	GMR (95% CI <sup>e</sup> )
5	98.8	98.7	0.2 (-1.1, 1.4)	1.87	2.51	0.74 (0.67, 0.82)
6A	99.5	99.9	-0.4 (-1.2, 0.3)	9.01	11.69	0.77 (0.70, 0.85)
6B	99.1	99.5	-0.4 (-1.4, 0.6)	4.01	5.74	0.70 (0.62, 0.79)
7F	99.5	99.9	-0.4 (-1.2, 0.3)	3.91	5.18	0.76 (0.70, 0.82)
9V	98.3	98.9	-0.6 (-2.0, 0.6)	3.44	4.30	0.80 (0.73, 0.88)
14	99.2	99.6	-0.4 (-1.4, 0.5)	5.68	6.34	0.90 (0.81, 1.00)
18C	97.6	97.9	-0.2 (-1.8, 1.3)	3.46	4.69	0.74 (0.67, 0.82)
19A	99.9	99.7	0.1 (-0.5, 0.9)	3.53	4.13	0.85 (0.77, 0.94)
19F	98.8	98.7	0.2 (-1.1, 1.4)	5.01	5.79	0.86 (0.78, 0.96)
23F	96.6	97.9	-1.3 (-3.1, 0.4)	3.95	6.18	0.64 (0.57, 0.72)
<b>Additional Serotypes</b>						
8	99.2	97.9 <sup>f</sup>	1.4 (0.1, 2.8)	3.97	2.12 <sup>g</sup>	1.87 (1.71, 2.06)
10A	98.7	97.9 <sup>f</sup>	0.8 (-0.5, 2.3)	6.22	2.12 <sup>g</sup>	2.94 (2.64, 3.26)
11A	98.7	97.9 <sup>f</sup>	0.8	3.53	2.12 <sup>g</sup>	1.67

**Table 4. Percentage of Participants with Specified Pneumococcal IgG Concentrations and Pneumococcal IgG GMCs (µg/mL) One Month After Dose 4 of a 4-Dose Series, Study 1011<sup>a</sup>**

	Percentages of Participants with Specified IgG Concentrations <sup>b</sup>			IgG GMCs		
	Prevnar 20 N <sup>c</sup> = 753-755	Prevnar 13 N <sup>c</sup> = 744-745	Difference (Prevnar 20 – Prevnar 13)	Prevnar 20 N <sup>c</sup> = 753-755	Prevnar 13 N <sup>c</sup> = 744-745	Prevnar 20 /Prevnar 13
	%	%	% (95% CI <sup>d</sup> )	GMC <sup>e</sup>	GMC <sup>e</sup>	GMR (95% CI <sup>e</sup> )
			(-0.5, 2.3)			(1.51, 1.84)
12F	86.4	97.9 <sup>f</sup>	-11.5 (-14.3, -8.9)	1.85	2.12 <sup>g</sup>	0.88 (0.79, 0.97)
15B	99.6	97.9 <sup>f</sup>	1.8 (0.7, 3.1)	12.59	2.12 <sup>g</sup>	5.95 (5.39, 6.55)
22F	99.6	97.9 <sup>f</sup>	1.8 (0.7, 3.1)	10.60	2.12 <sup>g</sup>	5.01 (4.54, 5.52)
33F	99.6	97.9 <sup>f</sup>	1.8 (0.7, 3.1)	9.31	2.12 <sup>g</sup>	4.40 (3.99, 4.85)
<p>Abbreviations: CI = confidence interval; dLIA = Luminex-based direct immunoassay; ELISA = enzyme-linked immunosorbent assay; GMC = geometric mean concentration; GMR = geometric mean ratio; IgG = immunoglobulin G; LLOQ = lower limit of quantitation.</p> <p>Note: Non-inferiority for a serotype was concluded if the lower bound of the 2-sided 95% CI for the GMR (<b>Prevnar 20</b> to Prevnar 13) was &gt;0.5 for that serotype.</p> <p>Note: Assay results below the LLOQ were set to 0.5 × LLOQ in the analysis.</p> <p>a. Study 1011 was conducted in the United States and the territory of Puerto Rico (NCT04382326).</p> <p>b. Specified levels for the Prevnar 13 serotypes are from a published bridging study (Tan CY, et al. 2018) using results from after primary infant doses, before toddler dose, and after toddler dose (schedule of 3 infant doses followed by a toddler dose) except for serotype 19A, which used results from after primary infant doses only. For the additional 7 serotypes, specified levels are from a concordance evaluation (clinical dLIA to re-test ELISA) of data from a Phase 2 Study B7471003, which also uses the schedule of 3 infant doses followed by a toddler dose.</p> <p>c. N = Number of participants with valid IgG concentrations.</p> <p>d. Two-sided CI based on the Miettinen and Nurminen method.</p> <p>e. GMCs, GMRs and the associated 2-sided CIs were calculated by exponentiating the means and the mean differences (<b>Prevnar 20</b> – Prevnar 13) of the logarithm of the concentrations and the corresponding CIs (based</p>						

**Table 4. Percentage of Participants with Specified Pneumococcal IgG Concentrations and Pneumococcal IgG GMCs (µg/mL) One Month After Dose 4 of a 4-Dose Series, Study 1011<sup>a</sup>**

	Percentages of Participants with Specified IgG Concentrations <sup>b</sup>			IgG GMCs		
	Prevnar 20 N <sup>c</sup> = 753-755	Prevnar 13 N <sup>c</sup> = 744-745	Difference (Prevnar 20 – Prevnar 13)	Prevnar 20 N <sup>c</sup> = 753-755	Prevnar 13 N <sup>c</sup> = 744-745	Prevnar 20 /Prevnar 13
	%	%	% (95% CI <sup>d</sup> )	GMC <sup>e</sup>	GMC <sup>e</sup>	GMR (95% CI <sup>e</sup> )
<p>on the Student t distribution).</p> <p>f. For the percentage differences of the 7 additional serotypes, the IgG results from serotype 18C or 23F (Prevnar 13 serotype with the lowest percentage excluding serotype 3) in the Prevnar 13 group was used in the comparisons for non-inferiority. Percentages of participants with specified IgG concentrations to serotypes 8, 10A, 11A, 12F, 15B, 22F and 33F in the Prevnar 13 group were 4.2%, 2.2%, 3.8%, 0.1%, 3.1%, 1.7% and 2.3%, respectively.</p> <p>g. For the GMRs of the 7 additional serotypes, the IgG results from serotype 1 (Prevnar 13 serotype with the lowest GMC excluding serotype 3) in the Prevnar 13 group was used in the comparisons for non-inferiority. IgG GMCs to serotypes 8, 10A, 11A, 12F, 15B, 22F and 33F in the Prevnar 13 group were 0.03 µg/mL, 0.01 µg/mL, 0.02 µg/mL, 0.01 µg/mL, 0.02 µg/mL, 0.00 µg/mL and 0.01 µg/mL, respectively.</p>						

OPA GMTs for the 13 matched serotypes in the **Prevnar 20** group were generally comparable to the OPA GMTs in the Prevnar 13 group 1 month after the third infant dose, and they were slightly lower than in the Prevnar 13 group for most serotypes after the toddler dose. There is variability of the OPA data due to small sample sizes, while interpretation of the clinical relevance of slightly lower OPA GMTs is unknown. The observed OPA GMTs for the 7 additional serotypes were substantially higher in the **Prevnar 20** group than the Prevnar 13 group.

**Prevnar 20** immune responses also show boosting of IgG concentrations and OPA GMTs after the toddler dose, indicating that a memory response was elicited by the 3 infant doses.

#### *Pneumococcal IgG immune responses following 2 and 3 doses of 3-dose vaccination series*

In Study 1012, 1,204 infants 2 months ( $\geq 42$  to  $\leq 112$  days) of age at the time of consent and born at  $> 36$  weeks of gestation were randomised (1:1) and vaccinated with either **Prevnar 20** or Prevnar 13. The first dose was given at enrollment, a second dose approximately 2 months later, and the third dose at approximately 11 to 12 months of age.



One month after 2 infant doses, the observed IgG GMCs for 9 of the 13 matched serotypes were non-inferior to those in the Prevnar 13 group, and 4 of the 13 matched serotypes (6A, 6B, 9V, and 23F) did not meet the 2-fold statistical criterion for non-inferiority. The percentages of participants with specified serotype-specific IgG concentrations 1 month after Dose 2 of **Prevnar 20** for 4 of the 13 matched serotypes were non-inferior to those of the Prevnar 13 group based on a 10% difference non-inferiority criteria; and 9 of the 13 matched serotypes (1, 3, 4, 5, 6A, 6B, 9V, 18C and 23F) did not meet non-inferiority.

The immune responses to the additional 7 serotypes after **Prevnar 20** were non-inferior to the lowest IgG GMC among the 13 serotypes (serotype 6B) in Prevnar 13. For the 7 additional serotypes, the percentages of participants with specified serotype-specific IgG concentrations 1 month after Dose 2 of **Prevnar 20** for 5 of the 7 additional serotypes were non-inferior to the serotype with the lowest percentage among the 13 serotypes (serotype 6B) in the Prevnar 13 group and serotypes 10A and 12F did not meet the statistical non-inferiority criterion. The clinical relevance of these findings is unknown. Additionally, the IgG GMCs for the 7 additional serotypes were higher compared with the IgG GMCs from the corresponding serotypes in the Prevnar 13 group after two infant doses. One month after the third (toddler) dose, the observed IgG GMCs of **Prevnar 20** were non-inferior to the Prevnar 13 group for 12 of 13 matched serotypes except for serotype 6B and all 7 additional serotypes were non-inferior to the lowest IgG GMC in the Prevnar 13 group. Additionally, the IgG GMCs for the 7 additional serotypes were higher compared with the IgG GMCs from the corresponding serotypes in the Prevnar 13 group after the toddler dose.

Functional responses, as measured by OPA GMTs, for the 13 matched serotypes at 1 month after the second infant dose and 1 month after the toddler dose in the **Prevnar 20** group were generally similar to the observed OPA GMTs in the Prevnar 13 group for most serotypes and the observed OPA GMTs were substantially higher for the 7 additional serotypes at both timepoints in the **Prevnar 20** group than in the Prevnar 13 group. Increases in IgG and OPA antibody responses after **Prevnar 20** following Dose 2 to after Dose 3 were observed for all 20 serotypes including those that missed non-inferiority, indicative of immunological memory.

#### ***Children 12 months to less than 18 years of age (Studies 1027 and 1014)***

*Children 12 months to less than 24 months of age previously vaccinated with Prevnar 13 (Study 1027)*

In a multicentre, randomised, partially double-blinded trial (Study 1027), 356 participants 12 months to less than 24 months of age with 2 prior infant doses of Pevnar 13 were enrolled and randomised to receive either 1 or 2 toddler doses of **Pevnar 20**, or a single dose of Pevnar 13 (control). In the group receiving 2 doses of **Pevnar 20**, the second dose was given approximately 2 months after Dose 1.

IgG immune responses to the 13 matched serotypes were observed after 1 or 2 doses of **Pevnar 20** with the observed IgG GMCs numerically higher for most of the 13 matched serotypes after 1 dose of **Pevnar 20** than after 2 doses of **Pevnar 20**. The observed IgG GMCs 1 month after last vaccination for the 13 matched serotypes were lower after 1 or 2 doses of **Pevnar 20** than after 1 dose of Pevnar 13. IgG immune responses to all 7 additional serotypes were observed after 1 or 2 doses of **Pevnar 20**, with numerically higher IgG responses after 2 doses of **Pevnar 20** than after a single dose. The observed IgG GMCs for all 7 additional serotypes (not covered by Pevnar 13) were low 1 month after a single toddler dose of Pevnar 13.

OPA responses were elicited for all 20 serotypes with similar tendencies as described above for IgG GMCs.

#### ***Children and adolescents 15 months to less than 18 years of age (Study 1014)***

In a multicentre, single-arm trial (Study 1014), participants were enrolled into the study by age group (approximately 200 participants per group) to receive a single dose of **Pevnar 20** as described below.

##### ***Children 15 months to less than 24 months of age previously vaccinated with Pevnar 13***

In 15 months to less than 24 months age group, participants had been previously vaccinated with 3 or 4 doses of Pevnar 13. Increases in IgG concentrations from before to 1 month after **Pevnar 20** were observed for all 20 vaccine serotypes. The observed IgG geometric mean fold rises (GMFRs) to the 7 additional serotypes ranged from 27.9 to 1847.7.

##### ***Children 24 months to less than 5 years of age previously vaccinated with Pevnar 13***

In 24 months to less than 5 years age group, participants had been previously vaccinated with 3 or 4 doses of Pevnar 13. Increases in IgG concentrations from before to 1 month after **Pevnar 20** were observed for all 20 vaccine serotypes. The observed IgG GMFRs to the 7 additional serotypes ranged from 36.6 to 796.2. For the 7 additional serotypes, 71.2% to 94.6% had  $\geq 4$ -fold rise in OPA titres.

Children and adolescents 5 years to less than 18 years of age previously unvaccinated or vaccinated with Prevnar 13

In participants 5 years to less than 10 years and 10 years to less than 18 years of age, irrespective of prior vaccination history with Prevnar 13, **Prevnar 20** elicited robust IgG and OPA immune responses to the 20 vaccine serotypes after a single dose in participants 5 to less than 18 years of age. OPA GMFRs ranged from 11.5 to 499.0 to the 7 additional serotypes and increases in OPA GMTs were observed for all 20 vaccine serotypes.

Preterm infants

No immunogenicity data is available with **Prevnar 20** in preterm infants. Based on experience with Prevnar and Prevnar 13, immune responses are elicited in preterm infants, although they may be lower than in term infants. The safety and tolerability of **Prevnar 20** were evaluated in Phase 3 study (Study 1013), which included 111 late preterm infants (infants born at 34 to less than 37 weeks of gestational age) among the total study population. Participants were randomised to receive a 4-dose series of either **Prevnar 20** (N=77) or Prevnar 13 (N=34).

**Prevnar 20 clinical trials in adults**

Three Phase 3 clinical trials, B7471006, B7471007 and B7471008 (Study 1006, Study 1007, and Study 1008), were conducted in the United States and Sweden evaluating the immunogenicity of **Prevnar 20** in different adult age groups, and in participants who were either pneumococcal vaccine-naïve, or previously vaccinated with Prevnar 13, PPSV23, or both.

Each study included participants who were healthy or immunocompetent with stable underlying conditions, including chronic cardiovascular disease, chronic pulmonary disease, renal disorders, diabetes mellitus, chronic liver disease, and medical risk conditions and behaviours (e.g., smoking) that are known to increase the risk of serious pneumococcal pneumonia and IPD. In the pivotal study (Study 1007), these risk factors were identified in 34%, 32%, and 26% of participants 60 years of age and over, 50 to 59 years of age, and 18 to 49 years of age, respectively. A stable medical condition was defined as a medical condition not requiring significant change in therapy in the previous 6 weeks (i.e., change to new therapy category due to worsening disease), or any hospitalization for worsening disease within 12 weeks before receiving the study vaccine.

In each study, immune responses elicited by **Prevnar 20** and the control pneumococcal vaccines were measured by an opsonophagocytic activity (OPA) assay. OPA assays measure functional antibodies to *S. pneumoniae*.

#### Comparison of immune responses of **Prevnar 20** to Prevnar 13 and PPSV23

In a randomised, active-controlled, double-blind, non-inferiority clinical trial (Pivotal Study 1007) of **Prevnar 20** in the United States and Sweden, pneumococcal vaccine-naïve participants 18 years of age and older were enrolled into 1 of 3 cohorts based on their age at enrollment (18 to 49, 50 to 59, and  $\geq 60$  years of age), and randomised to receive **Prevnar 20** or control. Participants 60 years of age and older were randomised in a 1:1 ratio to receive **Prevnar 20** (n = 1,507) followed 1 month later with the administration of saline placebo or Prevnar 13 (n = 1,490), and with the administration of PPSV23 1 month later. Participants 18 to 49 years of age and 50 to 59 years of age were randomly assigned (3:1 ratio); they received a dose of **Prevnar 20** (18 to 49 years of age: n = 335; 50 to 59 years of age: n = 334) or Prevnar 13 (18 to 49 years of age: n = 112; 50 to 59 years of age: n = 111).

Serotype-specific OPA GMTs were measured before the first vaccination and 1 month after each vaccination. Non-inferiority of immune responses, OPA GMTs 1 month after vaccination, with **Prevnar 20** to a control vaccine for a serotype was declared if the lower bound of the 2 sided 95% CI for the GMT ratio (**Prevnar 20** / Prevnar 13; **Prevnar 20** / PPSV23) for that serotype was greater than 0.5.

In participants 60 years of age and older, the immune responses to all 13 matched serotypes elicited by **Prevnar 20** were non-inferior to those elicited by Prevnar 13 for the same serotypes 1 month after vaccination. In general, numerically lower geometric mean titres were observed with **Prevnar 20** in the matched serotypes compared to Prevnar 13 (Table 5), however the clinical relevance of these findings is unknown.

The immune responses induced by **Prevnar 20** to 6/7 additional serotypes were non-inferior to those induced by PPSV23 to the same serotypes 1 month after vaccination. The response to serotype 8 missed the pre-specified statistical non-inferiority criterion (the lower bound of the 2-sided 95% CI for the GMT ratio is 0.49 instead of  $> 0.50$ ) (Table 5). The clinical relevance of this observation is unknown. Supportive analyses for other serotype 8 endpoints in the **Prevnar 20** group showed favourable outcomes. These include a GMFR of 22.1 from before vaccination to 1-month post-vaccination, 77.8% of participants achieved a  $\geq 4$ -fold rise in OPA titres from before

vaccination to 1 month after vaccination, and 92.9% of participants achieved OPA titres  $\geq$  LLOQ 1 month after vaccination.

**Table 5. OPA GMTs 1 Month After Vaccination in Participants 60 Years of Age and Older Given Prevnar 20 Compared to Prevnar 13 for the 13 Matched Serotypes and to PPSV23 for the 7 Additional Serotypes (Study 1007)<sup>a,b,c,d</sup>**

	Prevnar 20 (N = 1157–1430)	Prevnar 13 (N = 1390–1419)	PPSV23 (N = 1201–1319)	Vaccine Comparison	
	GMT <sup>e</sup>	GMT <sup>e</sup>	GMT <sup>e</sup>	GMT Ratio <sup>e</sup>	95% CI <sup>e</sup>
<b>Serotype</b>					
1	123	154		0.80	0.71, 0.90
3	41	48		0.85	0.78, 0.93
4	509	627		0.81	0.71, 0.93
5	92	110		0.83	0.74, 0.94
6A	889	1165		0.76	0.66, 0.88
6B	1115	1341		0.83	0.73, 0.95
7F	969	1129		0.86	0.77, 0.96
9V	1456	1568		0.93	0.82, 1.05
14	747	747		1.00	0.89, 1.13
18C	1253	1482		0.85	0.74, 0.97
19A	518	645		0.80	0.71, 0.90
19F	266	333		0.80	0.70, 0.91
23F	277	335		0.83	0.70, 0.97
<b>Additional Serotypes</b>					
8	466		848	0.55	0.49, 0.62
10A	2008		1080	1.86	1.63, 2.12
11A	4427		2535	1.75	1.52, 2.01
12F	2539		1717	1.48	1.27, 1.72
15B	2398		769	3.12	2.62, 3.71
22F	3666		1846	1.99	1.70, 2.32
33F	5126		3721	1.38	1.21, 1.57

**Table 5. OPA GMTs 1 Month After Vaccination in Participants 60 Years of Age and Older Given Prevnar 20 Compared to Prevnar 13 for the 13 Matched Serotypes and to PPSV23 for the 7 Additional Serotypes (Study 1007)<sup>a,b,c,d</sup>**

	<b>Prevnar 20</b> (N = 1157–1430)	<b>Prevnar 13</b> (N = 1390–1419)	<b>PPSV23</b> (N = 1201–1319)	<b>Vaccine Comparison</b>	
	<b>GMT<sup>e</sup></b>	<b>GMT<sup>e</sup></b>	<b>GMT<sup>e</sup></b>	<b>GMT Ratio<sup>e</sup></b>	<b>95% CI<sup>e</sup></b>
<p>Abbreviations: CI = confidence interval; GMT = geometric mean titre; LLOQ = lower limit of quantitation; N = number of participants; OPA = opsonophagocytic activity; PPSV23 = pneumococcal polysaccharide vaccine (23-valent).</p> <p>a. Study 1007 was conducted in the United States and in Sweden.</p> <p>b. Non-inferiority for a serotype was met if the lower bound of the 2-sided 95% CI for the GMT ratio (ratio of <b>Prevnar 20</b> / comparator) was greater than 0.5 (2-fold criterion for non-inferiority).</p> <p>c. Assay results below the LLOQ were set to 0.5 × LLOQ in the analysis.</p> <p>d. Evaluable immunogenicity population.</p> <p>e. GMTs and GMT ratios as well as the associated 2-sided CIs were based on analysis of log-transformed OPA titres using a regression model with vaccine group, sex, smoking status, age at vaccination in years, and baseline log transformed OPA titres.</p>					

#### Immunogenicity in participants 18 through 59 years of age

In Study 1007, participants 50 through 59 years of age and participants 18 through 49 years of age were randomly assigned (3:1 ratio) to receive 1 vaccination with **Prevnar 20** or Prevnar 13. Serotype-specific OPA GMTs were measured before vaccination and 1 month after vaccination. With both vaccines, higher immune responses were observed in younger participants compared with older participants. A non-inferiority analysis of **Prevnar 20** in the younger age group versus **Prevnar 20** in participants 60 through 64 years of age per serotype was performed to support the indication in adults 18 through 49 years of age and 50 through 59 years of age. Non-inferiority was declared if the lower bound of the 2-sided 95% CI for the GMT ratio (**Prevnar 20** in participants 18 through 49 years of age / 60 through 64 years of age and in 50 through 59 years of age / 60 through 64 years of age) for each of the 20 serotypes was > 0.5. **Prevnar 20** elicited immune responses to all 20 vaccine serotypes in the two of the younger age groups that were non-inferior to responses in participants 60 through 64 years of age 1 month after vaccination (Table 6).

While not planned as an active control for immunogenicity evaluations in the study, a post hoc descriptive analysis showed generally numerically lower OPA GMTs 1 month after **Prevnar 20** for

the matched serotypes compared to Prevnar 13 in participants 18 through 59 years of age, however the clinical relevance of these findings is unknown.

As noted above, individuals with risk factors were included in this study. Across all the age groups studied, in general, a numerically lower immune response was observed in participants with risk factors compared to participants without risk factors. The clinical relevance of this observation is unknown.

**Table 6. Comparisons of OPA GMTs 1 Month After Prevnar 20 in Participants 18 Through 49 or 50 Through 59 Years of Age to Participants 60 Through 64 Years of Age (Study 1007)<sup>a,b,c,d</sup>**

	<b>18–49 Years (N = 251–317)</b>	<b>60–64 Years (N = 765–941)</b>	<b>18–49 Years Relative to 60–64 Years</b>	<b>50–59 Years (N = 266–320)</b>	<b>60–64 Years (N = 765–941)</b>	<b>50–59 Years Relative to 60–64 Years</b>
	<b>GMT<sup>e</sup></b>	<b>GMT<sup>e</sup></b>	<b>GMT Ratio<sup>e</sup> (95% CI)<sup>e</sup></b>	<b>GMT<sup>e</sup></b>	<b>GMT<sup>e</sup></b>	<b>GMT Ratio<sup>e</sup> (95% CI)<sup>e</sup></b>
<b>Serotype</b>						
1	163	132	1.23 (1.01, 1.50)	136	132	1.03 (0.84, 1.26)
3	42	42	1.00 (0.87, 1.16)	43	41	1.06 (0.92, 1.22)
4	1967	594	3.31 (2.65, 4.13)	633	578	1.10 (0.87, 1.38)
5	108	97	1.11 (0.91, 1.36)	85	97	0.88 (0.72, 1.07)
6A	3931	1023	3.84 (3.06, 4.83)	1204	997	1.21 (0.95, 1.53)
6B	4260	1250	3.41 (2.73, 4.26)	1503	1199	1.25 (1.00, 1.56)
7F	1873	1187	1.58 (1.30, 1.91)	1047	1173	0.89 (0.74, 1.07)
9V	6041	1727	3.50 (2.83, 4.33)	1726	1688	1.02 (0.83, 1.26)
14	1848	773	2.39 (1.93, 2.96)	926	742	1.25 (1.01, 1.54)

**Table 6. Comparisons of OPA GMTs 1 Month After Prevnar 20 in Participants 18 Through 49 or 50 Through 59 Years of Age to Participants 60 Through 64 Years of Age (Study 1007)<sup>a,b,c,d</sup>**

	<b>18–49 Years (N = 251–317)</b>	<b>60–64 Years (N = 765–941)</b>	<b>18–49 Years Relative to 60–64 Years</b>	<b>50–59 Years (N = 266–320)</b>	<b>60–64 Years (N = 765–941)</b>	<b>50–59 Years Relative to 60–64 Years</b>
	<b>GMT<sup>e</sup></b>	<b>GMT<sup>e</sup></b>	<b>GMT Ratio<sup>e</sup> (95% CI)<sup>e</sup></b>	<b>GMT<sup>e</sup></b>	<b>GMT<sup>e</sup></b>	<b>GMT Ratio<sup>e</sup> (95% CI)<sup>e</sup></b>
18C	4460	1395	3.20 (2.53, 4.04)	1805	1355	1.33 (1.06, 1.68)
19A	1415	611	2.31 (1.91, 2.81)	618	600	1.03 (0.85, 1.25)
19F	655	301	2.17 (1.76, 2.68)	287	290	0.99 (0.80, 1.22)
23F	1559	325	4.80 (3.65, 6.32)	549	328	1.68 (1.27, 2.22)
<b>Additional Serotypes</b>						
8	867	508	1.71 (1.38, 2.12)	487	502	0.97 (0.78, 1.20)
10A	4157	2570	1.62 (1.31, 2.00)	2520	2437	1.03 (0.84, 1.28)
11A	7169	5420	1.32 (1.04, 1.68)	6417	5249	1.22 (0.96, 1.56)
12F	5875	3075	1.91 (1.51, 2.41)	3445	3105	1.11 (0.88, 1.39)
15B	4601	3019	1.52 (1.13, 2.05)	3356	2874	1.17 (0.88, 1.56)
22F	7568	4482	1.69 (1.30, 2.20)	3808	4228	0.90 (0.69, 1.17)
33F	7977	5693	1.40 (1.10, 1.79)	5571	5445	1.02 (0.81, 1.30)



**Table 6. Comparisons of OPA GMTs 1 Month After Prevnar 20 in Participants 18 Through 49 or 50 Through 59 Years of Age to Participants 60 Through 64 Years of Age (Study 1007)<sup>a,b,c,d</sup>**

	18–49 Years (N = 251–317)	60–64 Years (N = 765–941)	18–49 Years Relative to 60–64 Years	50–59 Years (N = 266–320)	60–64 Years (N = 765–941)	50–59 Years Relative to 60–64 Years
	GMT <sup>e</sup>	GMT <sup>e</sup>	GMT Ratio <sup>e</sup> (95% CI) <sup>e</sup>	GMT <sup>e</sup>	GMT <sup>e</sup>	GMT Ratio <sup>e</sup> (95% CI) <sup>e</sup>
Abbreviations: CI = confidence interval; GMT = geometric mean titre; LLOQ = lower limit of quantitation; N = number of participants; OPA = opsonophagocytic activity; PPSV23 = pneumococcal polysaccharide vaccine (23-valent).						
a. Study 1007 was conducted in the United States and in Sweden.						
b. Non-inferiority for a serotype was met if the lower bound of the 2-sided 95% CI for the GMT ratio (ratio of younger age group/60 through 64 years of age group) was greater than 0.5 (2-fold criterion for non-inferiority).						
c. Assay results below the LLOQ were set to 0.5 × LLOQ in the analysis.						
d. Evaluable immunogenicity population.						
e. GMTs, GMT ratios, and the associated 2-sided CIs were based on analysis of log-transformed OPA titres using a regression model with age group, sex, smoking status, and baseline log transformed OPA titres. The comparisons between participants 18 through 49 years of age and participants 60 through 64 years of age and between participants 50 through 59 years of age and participants 60 through 64 years of age were based on separate regression models.						

***Immunogenicity of Prevnar 20 in adults previously vaccinated with pneumococcal vaccine***

A Phase 3 randomised, open-label clinical trial (Study 1006) described immune responses to **Prevnar 20** in participants 65 years of age and older previously vaccinated with PPSV23, with Prevnar 13, or with Prevnar 13 followed by PPSV23. Participants previously vaccinated with Prevnar 13 (Prevnar 13 only or followed by PPSV23) were enrolled at sites in the United States, whereas participants and previously vaccinated with PPSV23 only were also enrolled from Swedish sites (35.5% in that category).

**Prevnar 20** elicited immune responses to all 20 vaccine serotypes in participants 65 years of age and older with prior pneumococcal vaccination (Table 7). Immune responses were lower in participants in both groups who received prior PPSV23 vaccinations.

**Table 7. Pneumococcal OPA GMTs Before and 1 Month After Prevnar 20 in Participants 65 Years of Age and Older With Prior Pneumococcal Vaccination (Study 1006)<sup>a,b,c,d</sup>**

	Prior PPSV23 only		Prior Prevnar 13 only		Prior Prevnar 13 and PPSV23	
	Before vaccination (N = 208–247)	After vaccination (N = 216–246)	Before vaccination (N = 210–243)	After vaccination (N = 201–243)	Before vaccination (N = 106–121)	After vaccination (N = 102–121)
	GMT (95% CI) <sup>e</sup>	GMT (95% CI) <sup>e</sup>	GMT (95% CI) <sup>e</sup>	GMT (95% CI) <sup>e</sup>	GMT (95% CI) <sup>e</sup>	GMT (95% CI) <sup>e</sup>
<b>Serotype</b>						
1	24 (20, 28)	51 (42, 62)	34 (28, 41)	115 (96, 138)	42 (32, 56)	82 (61, 110)
3	13 (11, 15)	31 (27, 36)	15 (13, 18)	54 (47, 63)	20 (17, 25)	39 (32, 48)
4	29 (23, 35)	150 (118, 190)	67 (53, 84)	335 (274, 410)	73 (53, 101)	194 (143, 262)
5	27 (24, 31)	63 (53, 75)	38 (32, 44)	87 (73, 104)	47 (37, 59)	83 (65, 108)
6A	57 (46, 70)	749 (577, 972)	125 (99, 158)	1081 (880, 1327)	161 (116, 224)	1085 (797, 1478)
6B	107 (86, 133)	727 (574, 922)	174 (138, 219)	1159 (951, 1414)	259 (191, 352)	1033 (755, 1415)
7F	156 (132, 184)	378 (316, 452)	210 (175, 251)	555 (467, 661)	206 (164, 258)	346 (277, 432)
9V	203 (171, 241)	550 (454, 667)	339 (282, 408)	1085 (893, 1318)	352 (270, 459)	723 (558, 938)
14	212 (166, 270)	391 (315, 486)	282 (224, 356)	665 (554, 798)	336 (238, 473)	581 (434, 777)
18C	173 (137, 218)	552 (445, 684)	219 (177, 272)	846 (693, 1033)	278 (209, 369)	621 (470, 821)
19A	82 (66, 100)	239 (197, 288)	124 (100, 153)	365 (303, 440)	182 (141, 235)	341 (264, 439)
19F	61 (52, 71)	159 (131, 192)	89 (74, 107)	242 (199, 294)	120 (94, 154)	218 (168, 282)

**Table 7. Pneumococcal OPA GMTs Before and 1 Month After Prevnar 20 in Participants 65 Years of Age and Older With Prior Pneumococcal Vaccination (Study 1006)<sup>a,b,c,d</sup>**

	Prior PPSV23 only		Prior Prevnar 13 only		Prior Prevnar 13 and PPSV23	
	Before vaccination (N = 208–247)	After vaccination (N = 216–246)	Before vaccination (N = 210–243)	After vaccination (N = 201–243)	Before vaccination (N = 106–121)	After vaccination (N = 102–121)
	GMT (95% CI) <sup>e</sup>	GMT (95% CI) <sup>e</sup>	GMT (95% CI) <sup>e</sup>	GMT (95% CI) <sup>e</sup>	GMT (95% CI) <sup>e</sup>	GMT (95% CI) <sup>e</sup>
23F	23 (18, 28)	152 (115, 199)	48 (37, 62)	450 (358, 566)	66 (46, 94)	293 (204, 420)
<b>Additional Serotypes</b>						
8	55 (45, 67)	212 (172, 261)	28 (24, 33)	603 (483, 753)	139 (99, 195)	294 (220, 392)
10A	212 (166, 269)	1012 (807, 1270)	141 (113, 177)	2005 (1586, 2536)	400 (281, 568)	1580 (1176, 2124)
11A	510 (396, 656)	1473 (1192, 1820)	269 (211, 343)	1908 (1541, 2362)	550 (386, 785)	1567 (1141, 2151)
12F	147 (112, 193)	1054 (822, 1353)	53 (43, 65)	1763 (1372, 2267)	368 (236, 573)	1401 (1002, 1960)
15B	140 (104, 189)	647 (491, 853)	74 (56, 98)	1480 (1093, 2003)	190 (124, 291)	1067 (721, 1578)
22F	167 (122, 230)	1773 (1355, 2320)	60 (45, 82)	4157 (3244, 5326)	286 (180, 456)	2718 (1978, 3733)
33F	1129 (936, 1362)	2026 (1684, 2437)	606 (507, 723)	3175 (2579, 3908)	1353 (1037, 1765)	2183 (1639, 2908)
Abbreviations: CI = confidence interval; GMT = geometric mean titre; LLOQ = lower limit of quantitation; N = number of participants; OPA = opsonophagocytic activity; PPSV23 = pneumococcal polysaccharide vaccine (23-valent).						
a. Study 1006 was conducted in the United States and in Sweden.						
b. Assay results below the LLOQ were set to 0.5 × LLOQ in the analysis.						
c. Evaluable immunogenicity population.						
d. Open-label administration of <b>Prevnar 20</b> .						
e. 2-sided CIs based on the Student t distribution.						

### ***Immune responses in special populations***

Individuals with the conditions described below have an increased risk of pneumococcal disease.

Studies in individuals with SCD, HIV, and HSCT have not been conducted with **Prevnar 20**.

Experience from clinical studies with Prevnar 13 (a pneumococcal conjugate vaccine consisting of 13 polysaccharide conjugates that are also in **Prevnar 20**) are available in children and adults at higher risk of pneumococcal infection including immunocompromised children and adults with HIV infection or HSCT, and children with SCD.

Participants who were healthy, or with stable non-immunocompromising chronic medical conditions, in all the age groups analysed had a lower immune response with **Prevnar 20** compared with Prevnar 13 in spite of meeting the predefined non-inferiority margins. The clinical relevance of this observation is unknown.

### ***Sickle cell disease (SCD)***

An open-label single-arm study with 2 doses of Prevnar 13 given 6 months apart was conducted in 158 children and adolescents 6 to <18 years of age with SCD who were previously vaccinated with one or more doses of 23-valent pneumococcal polysaccharide vaccine at least 6 months prior to enrollment. After the first vaccination, Prevnar 13 elicited antibody levels measured by both IgG GMCs and OPA GMTs that were statistically significantly higher when compared with levels prior to vaccination. After the second dose, immune responses were comparable to those after the first dose. One year after the second dose, antibody levels measured by both IgG GMCs and OPA GMTs were higher than levels prior to the first dose of Prevnar 13, except for the IgG GMCs for serotypes 3 and 5 that were numerically similar.

### ***HIV infection***

#### ***Children and adults not previously vaccinated with a pneumococcal vaccine***

In Study 6115A1-3002 (B1851021), 151 participants 6 to < 18 years of age and 152 participants  $\geq$  18 years of age infected with HIV (CD4  $\geq$  200 cells/ $\mu$ L, viral load < 50,000 copies/mL and free of active acquired immunodeficiency syndrome [AIDS]-related illness) not previously vaccinated with a pneumococcal vaccine were enrolled to receive 3 doses of Prevnar 13. As per the general recommendations, a single dose of PPSV23 was subsequently administered. The vaccines were administered at 1-month intervals. Immune responses were assessed in 128 to 133 evaluable participants 6 to < 18 years of age and in 131 to 137 evaluable participants  $\geq$  18 years of age

approximately 1 month after each dose of the vaccine. After the first dose, Prevnar 13 elicited antibody levels, measured by IgG GMCs and OPA GMTs, that were statistically significantly higher compared with levels prior to vaccination. After the second and third dose of Prevnar 13, immune responses were similar to or higher than those after the first dose.

#### Adults previously vaccinated with PPSV23

In Study 6115A1-3017 (B1851028), immune responses were assessed in 329 HIV-infected participants  $\geq 18$  years of age (CD4+ T-cell count  $\geq 200$  cells/ $\mu$ L and viral load  $< 50,000$  copies/mL) previously vaccinated with PPSV23 administered at least 6 months prior to enrollment. Participants received 3 doses of Prevnar 13: at enrollment, 6 months, and 12 months after the first dose of Prevnar 13. After the first vaccination, Prevnar 13 elicited antibody levels measured by IgG GMCs and OPA GMTs that were statistically significantly higher compared with levels prior to vaccination. After the second and third dose of Prevnar 13, immune responses were comparable to or higher than those after the first dose. Participants who received previously 2 or more doses of PPSV23 showed a similar immune response compared to participants who previously received a single dose.

#### ***Haematopoietic stem cell transplant (HSCT)***

In Study 6115A1-3003 (B1851022), 61 participants 2 to  $< 18$  years of age and 190 participants  $\geq 18$  years of age with an allogeneic HSCT were enrolled to receive 3 doses of Prevnar 13 with an interval of at least 1 month between doses. The first dose was administered at 3 to 6 months after HSCT. A fourth (booster) dose of Prevnar 13 was administered 6 months after the third dose. As per the general recommendations, a single dose of PPSV23 was administered 1 month after the fourth dose of Prevnar 13. Immune responses, as measured by IgG GMCs, were assessed in 41 to 52 evaluable participants 2 to  $< 18$  years of age and in 127 to 159 evaluable participants  $\geq 18$  years of age approximately 1 month after vaccination. Prevnar 13 elicited increased antibody levels after each dose. Immune responses after the fourth dose of Prevnar 13 were significantly increased for all serotypes compared with those after the third dose with the exception of serotype 3 in the 2 to  $< 18$  years age group. Overall, participants 2 to  $< 18$  years of age had generally higher serotype-specific immune responses compared with those  $\geq 18$  years of age.

This study demonstrated that 4 doses of Prevnar 13 elicited serum IgG concentrations similar to those induced by a single dose in healthy participants of the same age group.

### ***Invasive pneumococcal disease (IPD)***

Vaccine effectiveness of Prevnar 13 against vaccine-serotype IPD was evaluated in the SpIDnet study, a multi-country enhanced IPD surveillance project in Europe. Based on data over a 6-year period (2012-2018) from 10 sites in 7 European countries using Prevnar 13, the effectiveness against IPD caused by serotypes in the vaccine among children <5 years of age was 84.2% (95% CI, 79.0-88.1) and 88.7% (95% CI, 81.7-92.7) in children receiving  $\geq 1$  Prevnar 13 dose and a complete vaccination schedule, respectively.

### **5.2. Pharmacokinetic properties**

Not applicable.

### **5.3. Preclinical safety data**

Non-clinical data revealed no special hazard for humans based on conventional studies of repeated dose toxicity and reproduction and developmental toxicity.

## **6. PHARMACEUTICAL PARTICULARS**

### **6.1. List of excipients**

Sodium chloride

Succinic acid

Polysorbate 80

Water for injections

For adjuvant, see section 2.

### **6.2. Incompatibilities**

In the absence of compatibility studies, this vaccine must not be mixed with other medicinal products.

### **6.3. Shelf life**

2 years.

### **6.4. Special precautions for storage**

Store in a refrigerator (2°C to 8°C). Pre-filled syringes should be stored in the refrigerator horizontally to minimise the resuspension time.

Do not freeze. Discard if the vaccine has been frozen.

From a microbiological point of view, once removed from the refrigerator, the vaccine should be used immediately.

Stability data indicate that the vaccine is stable for 96 hours when stored at temperatures from 8°C to 25°C, or 72 hours when stored at temperatures from 0°C to 2°C. At the end of these time periods **Prevnar 20** should be used or discarded. These data are intended to guide healthcare professionals in case of temporary temperature excursion only.

### 6.5. Nature and contents of container

0.5 mL suspension for injection in pre-filled syringe (Type I glass) with a tip cap (synthetic isoprene/bromobutyl blend rubber) and a plunger stopper (chlorobutyl rubber).

Pack sizes of 1, 10, and 50 pre-filled syringes, with or without needle.

Not all pack sizes may be marketed.

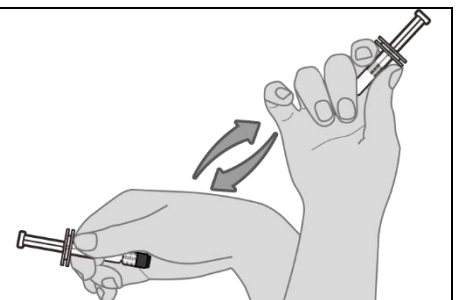
### 6.6. Special precautions for disposal and other handling

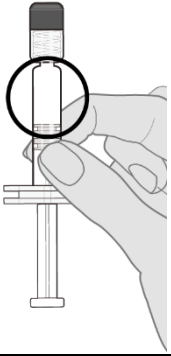
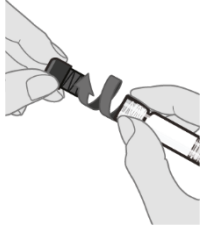
During storage, a white deposit and clear supernatant may be observed in the pre-filled syringe containing the suspension. Pre-filled syringes should be stored horizontally to minimise the resuspension time.

### Preparation for administration

#### Step 1. Vaccine resuspension

Hold the pre-filled syringe horizontally between the thumb and the forefinger and shake vigorously until the contents of the syringe are a homogeneous white suspension. Do not use the vaccine if it cannot be resuspended.



<p><b>Step 2. Visual inspection</b></p> <p>Visually inspect the vaccine for large particulate matter and discolouration prior to administration. Do not use if large particulate matter or discolouration is found. If the vaccine is not a homogeneous white suspension, repeat steps 1 and 2.</p>	
<p><b>Step 3. Remove syringe cap</b></p> <p>Remove the syringe cap from the Luer lock adapter by slowly turning the cap counterclockwise while holding the Luer lock adapter.</p> <p>Note: Care should be taken to ensure that the extended plunger rod is not depressed while removing the syringe cap.</p>	
<p><b>Step 4. Attach a sterile needle</b></p> <p>Attach a needle appropriate for intramuscular administration to the pre-filled syringe by holding the Luer lock adapter and turning the needle clockwise.</p>	

Any unused product or waste material should be disposed of in accordance with local requirements.

## 7. MARKETING AUTHORISATION HOLDER

Pfizer (Thailand) Limited  
Bangkok, Thailand

## 8. MARKETING AUTHORISATION NUMBER

Reg. No: 2C 7/67 (NBC)

## 9. DATE OF AUTHORISATION

19 August 2024

## 10. DATE OF REVISION OF THE TEXT

27 February 2025



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