NEW ZEALAND DATA SHEET

1. PRODUCT NAME

Comirnaty® LP.8.1 COVID-19 mRNA vaccine , 30 micrograms/0.3 mL dose, suspension for injection (dark grey caps)

Comirnaty® LP.8.1 COVID-19 mRNA vaccine , 30 micrograms/0.3 mL dose, suspension for injection in a pre-filled syringe

2. QUALITATIVE AND QUANTITATIVE COMPOSITION

This is a multidose vial (2.25 mL), or single dose pre-filled syringe. Do not dilute prior to use.

One multidose vial (dark grey cap) contains 6 doses of 0.3 mL.

One pre-filled syringe (glass) contains 1 dose of 0.3 mL.

One dose (0.3 mL) contains 30 micrograms of SARS-CoV-2 spike protein (mRNA) LP.8.1, a COVID-19 mRNA Vaccine (embedded in lipid nanoparticles).

SARS-CoV-2 spike protein (mRNA) LP.8.1 is a single-stranded, 5'-capped messenger RNA (mRNA) produced using a cell-free *in vitro* transcription from the corresponding DNA templates, encoding the viral spike (S) protein of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (LP.8.1).

For the full list of excipients, see Section 6.1 List of excipients.

3. PHARMACEUTICAL FORM

Suspension for injection.

The vaccine is a white to off-white suspension (pH 6.9 - 7.9).

4. CLINICAL PARTICULARS

4.1 Therapeutic indications

Active immunisation to prevent coronavirus disease 2019 (COVID-19) caused by SARS-CoV-2, in individuals 12 years of age and older.

The use of this vaccine should be in accordance with official recommendations.

4.2 Dose and method of administration

Dose

Individuals 12 years of age and older

Comirnaty LP.8.1 is administered intramuscularly as a single dose of 0.3 mL for individuals 12 years of age and older, regardless of prior COVID-19 vaccination status.

For individuals who have previously been vaccinated with a COVID-19 vaccine, Comirnaty LP.8.1 should be administered at least 3 months after the most recent dose of a COVID-19 vaccine.

Severely immunocompromised aged 12 years and older

Additional doses may be administered to individuals who are severely immunocompromised in accordance with official recommendations (see Section 4.4 Special warnings and precautions for use).

Paediatric population

There are paediatric formulations available for infants aged 6 months and above, and children below 12 years of age. For details, please refer to the data sheets for other formulations. The safety and efficacy of the vaccine in infants aged less than 6 months have not yet been established.

Elderly population

No dosage adjustment is required in elderly individuals ≥65 years of age.

Method of administration

Comirnaty LP.8.1 should be administered intramuscularly. The preferred site of administration is the deltoid muscle of the upper arm.

Do not inject Comirnaty LP.8.1 intravascularly, subcutaneously or intradermally.

Comirnaty should not be mixed in the same syringe with any other vaccines or medicinal products.

For precautions to be taken before administering Comirnaty LP.8.1, see Section 4.4 Special warnings and precautions for use. For instructions regarding thawing, handling and disposal of the vaccine, see Section 6.6 Special precautions for disposal and other handling.

Multidose vials

Multidose vials of Comirnaty LP.8.1 (dark grey cap) contain 6 doses of 0.3 mL of vaccine and do not require dilution.

In order to extract 6 doses from a multidose vial (dark grey cap), low dead-volume syringes and/or needles should be used. The low dead-volume syringe and needle combination should have a dead volume of no more than 35 microlitres. If standard syringes and needles are used, there may not be sufficient volume to extract a sixth dose from a single vial. Irrespective of the type of syringe and needle:

- Each dose must contain 0.3 mL of vaccine.

- If the amount of vaccine remaining in the vial cannot provide a full dose of 0.3 mL, discard the vial and any excess volume.
- Do not pool excess vaccine from multiple vials.

For instructions on thawing, handling and dose preparation of Comirnaty LP.8.1 suspension for injection, see Section 6.6 Special precautions for disposal and other handling.

Pre-filled syringes (glass)

The glass pre-filled syringes are supplied thawed and must not be shaken. If the glass pre-filled syringe has been frozen, discard. Do not shake. For instructions on handling and thawing the pre-filled syringes prior to use, refer to Section 6.6 Special precautions for disposal and other handling.

Each single dose pre-filled syringe contains 1 dose of 0.3 mL of vaccine.

Remove tip cap and attach a sterile needle appropriate for intramuscular injection and administer the entire volume of the syringe.

4.3 Contraindications

Hypersensitivity to the active substance or to any of the excipients listed in Section 6.1 List of excipients.

4.4 Special warnings and precautions for use

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.

General recommendations

Hypersensitivity and anaphylaxis

Events of anaphylaxis have been reported. Appropriate medical treatment and supervision should always be readily available in case of an anaphylactic reaction following the administration of Comirnaty.

The individual should be kept under close observation for at least 15 minutes following vaccination. A second dose of Comirnaty should not be given to those who have experienced anaphylaxis to the first dose of Comirnaty.

Myocarditis and pericarditis

Very rare cases of myocarditis and pericarditis have been observed following vaccination with Comirnaty. These cases have primarily occurred within 14 days following vaccination, more often after the second vaccination, and more often, but not exclusively in younger men. There have been reports in females. Based on accumulating data, the reporting rates of myocarditis and pericarditis after primary series in children ages 5 to 11 years are lower than in ages 12 to 17 years. Rates of myocarditis and pericarditis in booster doses do not appear to be higher than after the second dose in the primary series. The cases are generally mild and individuals tend to recover within a short time following standard treatment and rest. Cases of myocarditis and

pericarditis following vaccination have rarely been associated with severe outcomes including death.

Healthcare professionals should be alert to the signs and symptoms of myocarditis and pericarditis, including atypical presentations. Vaccinees should be instructed to seek immediate medical attention if they develop symptoms indicative of myocarditis or pericarditis such as (acute and persisting) chest pain, shortness of breath, or palpitations following vaccination. Non-specific symptoms of myocarditis and pericarditis also include fatigue, nausea and vomiting, abdominal pain, dizziness or syncope, oedema and cough. Healthcare professionals should consult guidance and/or specialists to diagnose and treat this condition.

Stress-related responses

Some individuals may have stress-related responses associated with the process of vaccination itself. Stress-related responses are temporary and resolve on their own. They may include dizziness, fainting, palpitations, increases in heart rate, alterations in blood pressure, feeling short of breath, tingling sensations, sweating and/or anxiety. Individuals should be advised to bring symptoms to the attention of the vaccination provider for evaluation and precautions should be in place to avoid injury from fainting.

Concurrent illness

Vaccination should be postponed in individuals suffering from acute severe febrile illness or acute infection. The presence of a minor infection and/or low grade fever should not delay vaccination.

Thrombocytopenia and coagulation disorders

As with other intramuscular injections, the vaccine should be given with caution in individuals receiving anticoagulant therapy or those with thrombocytopenia or any coagulation disorder (such as haemophilia) because bleeding or bruising may occur following an intramuscular administration in these individuals.

Immunocompromised individuals

Immunocompromised persons, including individuals receiving immunosuppressant therapy, may have a diminished immune response to the vaccine.

Clinical data on safety and immunogenicity after administration of Comirnaty (tozinameran) in immunocompromised participants are available in 37 participants 2 to 4 years old, 65 participants 5 to 11 years old, 15 participants 12 to 17 years old, and 7 participants 18 years of age and older (see Sections 4.8 Undesirable effects and 5.1 Pharmacodynamic properties).

Duration of protection

The duration of protection afforded by Comirnaty is unknown as it is still being determined by ongoing clinical trials.

Limitations of vaccine effectiveness

As with any vaccine, vaccination with Comirnaty may not protect all vaccine recipients. Individuals may not be fully protected until 7 days after their dose of Comirnaty.

Use in the elderly

Clinical studies of Comirnaty (tozinameran) include participants 65 years of age and older and their data contributes to the overall assessment of safety and efficacy. See Section 5.1 Pharmacodynamic properties, Clinical trials, Efficacy against COVID-19. No dosage adjustment is required in elderly individuals ≥65 years of age.

The data for use in the frail elderly is limited. The potential benefits of vaccination versus the potential risk and clinical impact of even relatively mild systemic adverse events in the frail elderly should be carefully assessed on a case-by-case basis.

The safety of a booster dose of Comirnaty (tozinameran) in individuals 65 years of age and older is based on safety data in 12 booster dose recipients 65 to 85 years of age in Study C4591001, 306 booster dose recipients 18 to 55 years of age in Study C4591001, and 1,175 booster dose recipients 65 years of age and older in Study C4591031. The effectiveness of a booster dose of Comirnaty (tozinameran) in individuals 65 years of age and older is based on effectiveness data in 306 booster dose recipients 18 to 55 years of age in Study C4591001, and an efficacy analysis from participants 16 years of age and older in 9,945 participants in Study C4591031.

Paediatric use

The safety and efficacy of Comirnaty in children aged less than 6 months of age have not yet been established.

Effects on laboratory tests

No data available.

4.5 Interactions with other medicines and other forms of interactions

Comirnaty LP.8.1 (30 micrograms/dose only) may be administered concomitantly with seasonal influenza vaccine.

The effectiveness and safety of concomitant Comirnaty (tozinameran) and seasonal influenza vaccination in individuals > 65 years of age is extrapolated from Study C4591030 (see Section 5.1 Pharmacodynamic properties).

In individuals 18 years of age and older, Comirnaty may be administered concomitantly with a pneumococcal conjugate vaccine (PCV) (see Section 5.1 Pharmacodynamic properties).

In individuals 60 years of age and older, Comirnaty may be administered concomitantly with an unadjuvanted respiratory syncytial virus (RSV) vaccine (see Section 5.1 Pharmacodynamic properties).

In individuals 65 years of age and older, Comirnaty may be administered concomitantly with an RSV vaccine and a high dose influenza vaccine (see Section 5.1 Pharmacodynamic properties).

Different injectable vaccines should be given at different injection sites.

Do not mix Comirnaty with other vaccines or products in the same syringe.

4.6 Fertility, pregnancy and lactation

Fertility

In a combined fertility and developmental toxicity study, female rats were intramuscularly administered Comirnaty (tozinameran) prior to mating and during gestation (4 full human doses of 30 micrograms each, spanning between pre-mating day 21 and gestation day 20). SARS-CoV-2 neutralising antibodies were present in maternal animals from prior to mating to the end of the study on postnatal day 21 as well as in fetuses and offspring. There were no vaccine related effects on female fertility and pregnancy rate.

Pregnancy

No data are available yet regarding the use of Comirnaty LP.8.1 during pregnancy.

There are clinical study data from the use of Comirnaty (tozinameran) in 173 pregnant women and no safety concerns were identified in the mother or their infant that were attributable to maternal vaccination (see Section 4.8 Undesirable effects). Animal studies do not indicate direct or indirect harmful effects with respect to pregnancy, embryo/fetal development, parturition or post-natal development (see Section 4.6 Fertility, pregnancy and lactation, Fertility).

Administration of Comirnaty LP.8.1 in pregnancy should only be considered when the potential benefits outweigh any potential risks for the mother and fetus.

Lactation

No data are available yet regarding the use of Comirnaty LP.8.1 during breast-feeding. A combined fertility and developmental toxicity study in rats did not show harmful effects on offspring development before weaning (see Section 4.6 Fertility, pregnancy and lactation, Fertility).

4.7 Effects on ability to drive and use machines

Comirnaty LP.8.1 has no, or negligible, influence on the ability to drive and use machines. However, some of the effects mentioned under Section 4.8 Undesirable effects may temporarily affect the ability to drive or use machines.

4.8 Undesirable effects

Summary of safety profile

The safety of Comirnaty (tozinameran) was evaluated in participants aged 6 months and older in clinical studies (comprised of 22,026 participants 16 years of age and older and 1,131 adolescents 12 to 15 years of age from Study C4591001, and 3,109 children 5 to 11 years of age, 2,368 participants 2 to 4 years of age and 1,458 participants 6 to 23 months of age from Study C4591007) that have received at least one dose of Comirnaty (tozinameran).

Additionally, 306 existing Phase 3 participants at 18 to 55 years of age received a booster dose of Comirnaty (tozinameran) approximately 6 months after the second dose in the non-placebo-controlled booster dose portion of Study C4591001. The overall safety profile for the booster dose was similar to that seen after 2 doses.

In Study C4591031, a placebo-controlled booster study, 5,081 participants 16 years of age and older were recruited from Study C4591001 to receive a booster dose of Comirnaty (tozinameran) at least 6 months after the second dose. The overall safety profile for the booster dose was similar to that seen after 2 doses.

In a subset of Study C4591054 (Substudy A, Phase 2/3), 412 participants 12 years of age and older, who had received at least 3 doses of an mRNA COVID-19 vaccine, received a booster dose of Comirnaty Omicron XBB.1.5. In another substudy of Study C4591054 (Substudy B, Phase 2/3), 311 participants 12 years of age and older, who were COVID-19 vaccine-naïve, received 1 dose of Comirnaty Omicron XBB.1.5. The safety profile of Comirnaty Omicron XBB.1.5 was similar to the overall Comirnaty safety profile.

In a subset of C4591048 (Substudy E, Phase 2/3), 310 participants 5 to 11 years of age who were COVID-19 vaccine-naïve, received 1 dose of Comirnaty Omicron XBB.1.5. The safety profile of Comirnaty Omicron XBB.1.5 was similar to the overall Comirnaty safety profile.

Omicron-adapted Comirnaty

Participants 12 years of age and older – after a single dose in vaccine-naïve individuals

In a subset of C4591054 (Substudy B, Phase 2/3), 311 participants 12 years of age and older, who were considered to be baseline SARS-CoV-2 positive and COVID-19 vaccine-naïve, received 1 dose of Comirnaty Omicron XBB.1.5 (raxtozinameran). Participants had a median follow-up time of 6.4 months up to a data cut-off date of 23 April 2024.

The safety profile of Comirnaty Omicron XBB.1.5 was similar to the overall Comirnaty safety profile. The most frequent adverse reactions in participants were injection site pain (>50%), fatigue (>30%), headache (>20%), chills (>10%), diarrhea (>10%), new or worsened muscle pain (>10%), new or worsened joint pain (>10%), and swelling (>10%).

Participants 5 to 11 years of age – after a single dose in vaccine-naïve individuals

In a subset of C4591048 (Substudy E, Phase 2/3), 310 participants 5 to 11 years of age who were COVID-19 vaccine-naïve, received 1 dose of Comirnaty Omicron XBB.1.5. Participants had a median follow-up time of 6.4 months up to a data cut-off date of 1 November 2024.

The safety profile of Comirnaty Omicron XBB.1.5 was similar to the overall Comirnaty safety profile. The most frequent adverse reactions in participants were pain at the injection site (>40%), fatigue (>10%), headache (>10%), and new or worsened muscle pain (>10%).

Participants 12 years of age and older – after a booster dose

In a subset of C4591054 (Substudy A, Phase 2/3), 412 participants 12 years of age and older, who had received at least 3 doses of an authorized mRNA COVID-19 vaccine, received a booster dose of Comirnaty Omicron XBB.1.5.The safety profile of Comirnaty Omicron XBB.1.5 was similar to the overall Comirnaty safety profile.

COMIRNATY (tozinameran)

Participants 16 years of age and older – after 2 doses

In Study C4591001, a total of 22,026 participants 16 years of age or older received at least 1 dose of Comirnaty (tozinameran) 30 micrograms and a total of 22,021 participants 16 years of age or older received placebo (including 138 and 145 adolescents 16 and 17 years of age in the

Comirnaty (tozinameran) and placebo groups, respectively). A total of 20,519 participants 16 years of age or older received 2 doses of Comirnaty (tozinameran).

At the time of the analysis of Study C4591001 with a data cut-off of 13 March 2021 for the placebo-controlled blinded follow-up period up to the participants' unblinding dates, a total of 25,651 (58.2%) participants (13,031 Comirnaty (tozinameran) and 12,620 placebo) 16 years of age and older were followed up for ≥4 months after the second dose. This included a total of 15,111 (7,704 Comirnaty (tozinameran) and 7,407 placebo) participants 16 to 55 years of age and a total of 10,540 (5,327 Comirnaty (tozinameran) and 5,213 placebo) participants 56 years and older.

The most frequent adverse reactions in participants 16 years of age and older that received 2 doses were injection site pain (>80%), fatigue (>60%), headache (>50%), myalgia (>40%), chills (>30%), arthralgia (>20%), pyrexia and injection site swelling (>10%) and were usually mild or moderate in intensity and resolved within a few days after vaccination. A slightly lower frequency of reactogenicity events was associated with greater age.

The safety profile in 545 subjects receiving Comirnaty (tozinameran), that were seropositive for SARS-CoV-2 at baseline, was similar to that seen in the general population.

Study C4591001 also included 200 participants with confirmed stable human immunodeficiency virus (HIV) infection. The safety profile of the participants receiving Comirnaty (tozinameran) (n=100) in the individuals with stable HIV infection was similar to that seen in the general population.

Adolescents 12 to 15 years of age – after 2 doses

In an analysis of long term safety follow-up in Study C4591001, 2,260 adolescents [1,131 Comirnaty (tozinameran) 30 micrograms; 1,129 placebo] were 12 to 15 years of age. Of these, 1,559 adolescents (786 Comirnaty (tozinameran) and 773 placebo) have been followed for ≥ 4 months after the second dose of Comirnaty (tozinameran). The safety evaluation in Study C4591001 is ongoing.

The most frequent adverse reactions in adolescents 12 to 15 years of age that received 2 doses were injection site pain (>90%), fatigue and headache (>70%), myalgia and chills (>40%), arthralgia and pyrexia (>20%).

Participants 12 years of age and older – after booster dose

A subset from Study C4591001 Phase 2/3 participants of 306 adults 18 to 55 years of age who completed the original Comirnaty (tozinameran) 2-dose course, received a booster dose of Comirnaty (tozinameran) approximately 6 months (range of 4.8 to 8.0 months) after receiving Dose 2. Of these, 301 participants have been followed for ≥4 months after the booster dose of Comirnaty (tozinameran).

The most frequent adverse reactions in participants 18 to 55 years of age were injection site pain (>80%), fatigue (>60%), headache (>40%), myalgia (>30%), chills and arthralgia (>20%).

In Study C4591031, a placebo-controlled booster study, participants 16 years of age and older recruited from Study C4591001 received a booster dose of Comirnaty (tozinameran) (5,081 participants), or placebo (5,044 participants) at least 6 months after the second dose of Comirnaty (tozinameran). Overall, participants who received a booster dose, had a median follow-up time of 2.8 months (range 0.3 to 7.5 months) after the booster dose in the blinded

placebo-controlled follow-up period to the cut-off date (8 February 2022). Of these, 1281 participants (895 Comirnaty (tozinameran) and 386 placebo) were followed for ≥ 4 months after the booster dose of Comirnaty (tozinameran). The overall safety profile for the booster dose was similar to that seen after 2 doses.

In another subset from Study C4591001, 825 adolescents 12 to 15 years of age who completed the Comirnaty (tozinameran) 2-dose course, received a booster dose of Comirnaty (tozinameran) approximately 11.2 months (range of 6.3 to 20.1 months) after receiving Dose 2. Overall, participants who received a booster dose, had a median follow-up time of 9.5 months (range 1.5 to 10.7 months) based on data up to the cut-off date (3 November 2022). No new adverse reactions of Comirnaty (tozinameran) were identified.

Participants 18 years of age and older – after subsequent booster doses

In a subset from study C4591031 (Phase 3), 325 adults 18 to ≤55 years of age who had completed 3 doses of Comirnaty (tozinameran), received a booster (fourth dose) of Comirnaty (tozinameran 30 micrograms) 90 to 180 days after receiving Dose 3. Participants who received a booster (fourth dose) of Comirnaty (tozinameran 30 micrograms) had a median follow-up time of 1.4 months. The most frequent adverse reactions in these participants were injection site pain (>70%), fatigue (>60%), headache (>40%), myalgia and chills (>20%) and arthralgia (>10%).

In a subset from Study C4591031 (Phase 3), 305 adults greater than 55 years of age who had completed 3 doses of Comirnaty (tozinameran), received a booster (fourth dose) of Comirnaty (tozinameran 30 micrograms) 5.3 to 13.1 months after receiving Dose 3. Participants who received a booster (fourth dose) of Comirnaty (tozinameran 30 micrograms) had a median follow-up time of at least 1.7 months up to a data cutoff date of 16 May 2022. The most frequent adverse reactions in participants greater than 55 years of age were injection site pain (60%), fatigue (>40%), headache (>20%), myalgia and chills (>10%).

Tabulated list of adverse reactions from clinical studies and post-authorisation experience

Adverse reactions observed during clinical studies are listed below according to the following frequency categories:

Very common (≥ 1/10),
Common (≥ 1/100 to < 1/10),
Uncommon (≥ 1/1,000 to < 1/100),
Rare (≥ 1/10,000 to < 1/1,000),
Very rare (< 1/10,000),
Not known (cannot be estimated from the available data).

Table 1: Adverse reactions from Comirnaty (tozinameran) and Comirnaty Omicron XBB.1.5 (raxtozinameran) clinical trials: Individuals 12 years of age and older

System Organ Class	Very common (≥ 1/10)	Common (≥ 1/100 to < 1/10)	Uncommon (≥ 1/1,000 to < 1/100)	Rare (≥ 1/10,000 to < 1/1,000)	Not known (cannot be estimated from the available data)
Blood and lymphatic system disorders			Lymphadenopathy[a]		

System Organ Class	Very common (≥ 1/10)	Common (≥ 1/100 to < 1/10)	Uncommon (≥ 1/1,000 to < 1/100)	Rare (≥ 1/10,000 to < 1/1,000)	Not known (cannot be estimated from the available data)
Metabolism and nutrition disorders			Decreased appetite		
Psychiatric disorders			Insomnia		
Nervous system disorders	Headache		Lethargy	Acute peripheral facial paralysis[b]	
Gastrointestinal disorders		Nausea;			
Skin and subcutaneous tissue disorders			Hyperhidrosis; Night sweats		
Musculoskeletal and connective tissue disorders	Arthralgia; Myalgia				
General disorders and administration site conditions	Injection site pain; Fatigue; Chills; Pyrexia[c]; Injection site swelling	Injection site redness	Asthenia; Malaise;		Facial swelling[d]

[a] A higher frequency of lymphadenopathy (2.8% vs 0.4%) was observed in participants receiving a booster dose in Study C4591031 compared to participants receiving 2 doses.
[b] Through the clinical trial safety follow-up period to 14 November 2020, acute peripheral facial paralysis (or palsy) was reported by four participants in the Comirnaty (tozinameran) group. Onset was Day 37 after Dose 1 (participant did not receive Dose 2) and Days 3, 9, and 48 after Dose 2. No cases of acute peripheral facial paralysis (or palsy) were reported in the placebo group.
[c] A higher frequency of pyrexia was observed after the second dose compared to the first dose. The preferred term pyrexia is a cluster term covering also body temperature increased.
[d] Facial swelling in vaccine recipients with a history of injection of dermatological fillers

Special populations

Pregnant women and infants born to maternal participants – after 2 doses of Comirnaty (tozinameran)

Study C4591015, a Phase 2/3, placebo-controlled study, evaluated Comirnaty (tozinameran) or placebo administered in 2 doses, approximately 21 days apart, in pregnant women 18 years of age and older, with the first dose given at 24 to 34 weeks gestation. A total of 346 pregnant women received Comirnaty (tozinameran) (n=173) or placebo (n=173).

The most frequent adverse reactions in pregnant women who received any primary series dose with Comirnaty (tozinameran) included injection site pain (>80%), fatigue (>60%), headache (>50%), myalgia (>30%), chills, arthralgia, and injection site swelling (>10%).

The safety profile in pregnant women who received Comirnaty (tozinameran) was similar to that of nonpregnant participants in other clinical studies, with no newly identified adverse reactions.

In Study C4591015, safety in infants born to maternal participants who received Comirnaty (tozinameran) (n=167) or placebo (n=168) was evaluated at birth and up to 6 months after birth. No safety concerns were identified that were attributable to maternal vaccination with Comirnaty (tozinameran).

Immunocompromised participants (adults and children)

In study C4591024, 37 participants 2 to 4 years old, 65 participants 5 to 11 years old, 15 participants 12 to 17 years old, and 7 participants 18 years of age and older from 5 different immunocompromised disease subsets (immunomodulatory therapy, solid organ transplant, stem cell transplant, non-small cell lung cancer (NSCLC)/chronic lymphocytic leukaemia (CLL) and haemodialysis) received at least 1 and up to 4 doses of Comirnaty (tozinameran) (Doses 1 and 2 were separated by 21 days, Doses 2 and 3 were separated by 28 days and Dose 4 was administered 3 to 6 months after Dose 3).

The safety profile in immunocompromised participants 2 years of age and older who received Comirnaty (tozinameran) was similar to that in non-immunocompromised participants in other clinical studies, with no newly identified adverse reactions.

Post-marketing experience

Although the events listed in Table 2 were not observed in the clinical trials, they are considered adverse drug reactions for Comirnaty as they were reported in the post-marketing experience. As these reactions were derived from spontaneous reports, the frequencies could not be determined and are thus considered as not known.

Table 2:Adverse reactions from Comirnaty post marketing experience

System Organ Class	Adverse Drug Reaction
Immune system disorders	Anaphylaxis Hypersensitivity reactions (e.g. rash, pruritis, urticaria, angioedema)
Cardiac disorders	Myocarditis Pericarditis
Nervous system disorders	Dizziness
Gastrointestinal disorders	Diarrhoea Vomiting
Musculoskeletal and connective tissue disorders	Pain in extremity (arm)[a]
General disorders and administration site conditions	Extensive swelling of vaccinated limb
Reproductive system and breast disorders	Heavy menstrual bleeding[b]

[a] A higher frequency of pain in extremity (1.1% vs. 0.8%) was observed in participants receiving a booster dose in Study C4591031 compared to participants receiving 2 doses.
[b] Most cases appear to be non-serious and temporary in nature.

Safety with concomitant vaccine administration

Concomitant administration with seasonal influenza vaccine

In Study C4591030, a Phase 3 study, participants 18 to 64 years of age who received Comirnaty (tozinameran) coadministered with seasonal inactivated influenza vaccine (SIIV), quadrivalent followed 1 month later by placebo (n=564), were compared to participants who received an inactivated influenza vaccine with placebo followed 1 month later by Comirnaty (tozinameran) alone (n=564). Reactogenicity events were reported more frequently by participants who received Comirnaty (tozinameran) coadministered with SIIV, quadrivalent, compared to participants who received Comirnaty (tozinameran) alone, but overall the reactogenicity events were mostly mild to moderate in severity. The most common adverse reactions reported in the coadministration group versus Comirnaty (tozinameran) alone were injection site pain (86.2% vs 84.4%, respectively), fatigue (64.0% vs 50.8%, respectively) and headache (47.2% vs 37.8%, respectively).

Concomitant administration with pneumococcal conjugate vaccine

In Study B7471026, a Phase 3 study, participants 65 years of age and older who received a booster dose of Comirnaty (tozinameran) coadministered with 20-valent pneumococcal conjugate vaccine (20vPnC) (n=187), the overall safety profile was similar with Comirnaty (tozinameran) given alone (n=185). Overall, reactogenicity events were mostly mild to moderate in severity. The most common adverse reactions reported in the coadministration group versus Comirnaty (tozinameran) alone were injection site pain (72.4% vs 67.6%, respectively), fatigue (54.1% vs 54.6%, respectively), and myalgia (32.4% vs 31.9 %, respectively).

Concomitant administration with an RSV vaccine or with an RSV vaccine and a high dose influenza vaccine

In Study C5481001, a Phase 1/2 study, participants 65 years of age and older who received Comirnaty Original/Omicron BA.4-5 (tozinameran/famtozinameran) and RSV (bivalent, recombinant) vaccine coadministered in one arm plus high dose quadrivalent influenza vaccine (QIV) (n=158) or placebo (n=157) in the opposite arm were compared to participants who received the individual vaccines given with placebo. The overall safety profile was similar with Comirnaty Original/Omicron BA.4-5 given alone (n=150).

Overall, reactogenicity events reported for the concomitantly administered vaccines were mostly mild to moderate in severity. The most common reported adverse reactions in the Comirnaty Original/Omicron BA.4-5 administered concomitantly with RSV vaccine group, Comirnaty Original/Omicron BA.4-5 administered concomitantly with both RSV vaccine and high dose QIV group, and Comirnaty Original/Omicron BA.4-5 alone were injection site pain (56.7%, 53.8%, and 62.7%, respectively) and fatigue (38.9%, 46.8%, and 35.3%, respectively).

Reporting suspected adverse effects

Reporting suspected adverse reactions after authorisation of the medicine is important. It allows continued monitoring of the benefit/risk balance of the medicine. Healthcare professionals are asked to report any suspected adverse reactions at https://pophealth.my.site.com/carmreportnz/s/.

4.9 Overdose

In clinical trials, participants who received up to 2 times the recommended dose of Comirnaty did not have an increase in reactogenicity or adverse reactions.

In post-authorisation experience, there have been reports of higher than recommended doses of Comirnaty. In general, adverse events reported with overdoses have been similar to the known adverse reaction profile of Comirnaty.

In the event of overdose, monitoring of vital functions and individualised symptomatic treatment is recommended.

For risk assessment and advice on the management of overdose please contact the National Poisons Centre on 0800 POISON (0800 764766).

5. PHARMACOLOGICAL PROPERTIES

5.1 Pharmacodynamic properties

Pharmacotherapeutic group: vaccines, Covid-19 RNA-based vaccines, ATC code: J07BN01.

Mechanism of action

The nucleoside-modified messenger RNA in Comirnaty is formulated in lipid nanoparticles, which enable delivery of the non-replicating RNA into host cells to direct transient expression of the SARS-CoV-2 spike (S) antigen. The mRNA codes for membrane-anchored, full-length S with two point mutations within the central helix. Mutation of these two amino acids to proline locks S in an antigenically preferred prefusion conformation. Comirnaty elicits both neutralising antibody and cellular immune responses to the antigen, which may contribute to protection against COVID-19.

Clinical efficacy and immunogenicity

Omicron-adapted Comirnaty

Immunogenicity in participants 12 years and older – after a single dose in vaccine-naïve individuals

In a subset from C4591054, (Substudy B [Phase 2/3]), the evaluable immunogenicity population of 302 vaccine-naïve participants 12 years of age and older who were considered to be SARS−CoV-2 positive at baseline, received 1 dose of Comirnaty Omicron XBB.1.5, was compared with participants in Substudy A [a subset from C4591054, (Phase 2/3)], who received Comirnaty Omicron XBB.1.5 after at least 3 doses of an mRNA COVID-19 vaccine.

Neutralising titres against Omicron XBB.1.5 increased from baseline to 1 month after study vaccination and were greater in participants receiving Comirnaty Omicron XBB.1.5 as a single dose compared with participants who received Comirnaty Omicron XBB.1.5 after at least 3 doses of an mRNA COVID-19 vaccine. Noninferiority was met with respect to the geometric mean ratio (GMR) of Omicron XBB.1.5-neutralising titres, and the difference in seroresponse to the XBB.1.5 strain in Substudy B vaccine-naïve participants compared to the subset of Substudy A (Table 3 and Table 4).

Table 3. Model-Based Geometric Mean Ratio – C4591054 Substudy B and Subset of Substudy A – Evaluable Immunogenicity Population

Assay[e]	Sampling Time Point[a]	Vaccine Group (as Assigned)				Group Comparison
		Vaccine-Naïve Substudy B Comirnaty Omicron XBB.1.5 30 mcg		Vaccine-Experienced Substudy A Comirnaty Omicron XBB.1.5 30 mcg		Substudy B / Substudy A
		n[b]	GMT[c] (95% CI[c])	n[b]	GMT[c] (95% CI[c])	GMR[d] (95% CI[d])
SARS-CoV-2 neutralisation assay - Omicron XBB.1.5 - NT50 (titre)[e]	1 month	299	4373.4 (3757.1, 5090.9)	296	2915.7 (2462.4, 3452.5)	1.93 (1.52, 2.44)[f]

Abbreviations: CI = confidence interval; GMR = geometric mean ratio; GMT = geometric mean titre; LLOQ = lower limit of quantitation; NT50 = 50% neutralising titre; SARS-CoV-2 = severe acute respiratory syndrome coronavirus 2.

a. Protocol-specified timing for blood sample collection.
b. n = Number of participants with valid and determinate assay results for the specified assay at both the pre−vaccination time point and the given sampling time point.
c. GMTs and 2-sided 95% CIs were calculated by exponentiating the mean logarithm of the titres and the corresponding CIs (based on the Student t distribution). Assay results below the LLOQ were set to 0.5 × LLOQ.
d. GMRs and the corresponding 2-sided 95% CIs were calculated by exponentiating the difference in least square means and the corresponding CIs based on a linear regression model with baseline assay results (log scale), age, and vaccine group as covariates.
e. SARS-CoV-2 NT50 were determined using a validated 384-well assay platform (Omicron subvariant XBB.1.5).
f. Noninferiority is declared if the lower bound of the 2-sided 95% CI for the GMR is greater than 0.67.

Table 4. Adjusted Difference in Percentages of Participants With Seroresponse – C4591054 Substudy B and Subset of Substudy A – Evaluable Immunogenicity Population

SARS-CoV-2 Neutralisation Assay[g]	Sampling Time Point[a]	Vaccine Group (as Assigned)				Group Comparison	
		Vaccine-Naïve Substudy B Comirnaty Omicron XBB.1.5 30 mcg		Vaccine-Experienced Substudy A Comirnaty Omicron XBB.1.5 30 mcg		Adjusted Difference	
		N[b]	n[c] (%) (95% CI[d])	N[b]	n[c] (%) (95% CI[d])	Difference %[e]	(95% CI[f])
SARS-CoV-2 neutralisation assay - Omicron XBB.1.5 - NT50 (titre)[g]	1 month	298	253 (84.9) (80.3, 88.8)	295	218 (73.9) (68.5, 78.8)	7.31	(1.34, 13.28)[h]

Abbreviations: CI = confidence interval; NT50 = 50% neutralising titre; SARS-CoV-2 = severe acute respiratory syndrome coronavirus 2.

a. Protocol-specified timing for blood sample collection.
b. N = number of participants with valid and determinate assay results for the specified assay at both the pre-vaccination time point and the given sampling time point. These values are the denominators for the percentage calculations.
c. n = Number of participants with a seroresponse for the given assay at the given sampling time point.
d. Exact 2-sided CI, based on the Clopper and Pearson method.

e. Difference in proportions, expressed as a percentage.
f. 2-Sided CI, based on the Miettinen and Nurminen method stratified by baseline neutralising titre category (< median, ≥ median) and age group (< median, ≥ median). The median of baseline neutralising titres and median age was calculated based on the pooled data in 2 comparator groups.
g. SARS-CoV-2 NT50 were determined using a validated 384-well assay platform Omicron subvariant XBB.1.5).
h. Noninferiority is declared if the lower bound of the 2-sided 95% CI for the difference in percentages of participants with seroresponse is >-10%.

Immunogenicity in participants 12 years of age and older – after a booster dose

In a subset from C4591054 (Substudy A, Phase 2/3), the evaluable immunogenicity population included 382 participants 12 years of age and older who had previously received at least 3 prior doses of an authorized mRNA COVID-19 vaccine, with the most recent dose being an Omicron BA.4/BA.5-adapted bivalent vaccine, received a booster dose of Comirnaty Omicron XBB.1.5. At baseline, 78.8% of participants were considered to be positive for prior SARS−CoV−2 infection.

Compared to participants receiving Comirnaty Original/Omicron BA.4-5 (C4591044), participants receiving Comirnaty Omicron XBB.1.5 (C4591054) had higher GMTs against Omicron XBB.1.5 (2622.3 [CI: 2246.6, 3060.9] versus 601.0 [CI: 499.5, 723.1]) and against Omicron BA.4/BA.5 (5105.1 [CI: 4483.4, 5813.0] versus 4146.0 [CI: 3512.6, 4893.5]) at 1 month after vaccination.

Seroresponse (NT50) was higher against Omicron XBB.1.5, and lower against Omicron BA.4/BA.5 among participants who received Comirnaty Omicron XBB.1.5 at 1 month after vaccination compared to the participants who Comirnaty Original/Omicron BA.4-5 (C4591044) with NT50 against Omicron XBB.1.5 of 73.9% (CI: 69.2%, 78.3%) versus 52.8% (CI: 45.6%, 59.9%), and NT50 against Omicron BA.4/BA.5 of 48.3% (CI: 43.2%, 53.4%) versus 63.0% (CI: 55.9%, 69.7%).

Comirnaty (tozinameran)

Study C4591001 is a multicentre, multinational, Phase 1/2/3 randomised, placebo-controlled, observer-blind dose-finding, vaccine candidate selection and efficacy study in participants 12 years of age and older. Randomisation was stratified by age: 12 to 15 years of age, 16 to 55 years of age, or 56 years of age and older, with a minimum of 40% of participants in the ≥56-year stratum. The study excluded participants who were immunocompromised and those who had previous clinical or microbiological diagnosis of COVID-19. Participants with pre-existing stable disease, defined as disease not requiring significant change in therapy or hospitalisation for worsening disease during the 6 weeks before enrolment, were included as were participants with known stable infection with HIV, hepatitis C virus (HCV) or hepatitis B virus (HBV).

Efficacy in participants 16 years of age and older – after 2 doses

In the Phase 2/3 portion of Study C4591001, based on data accrued through 14 November 2020, approximately 44,000 participants were randomised equally and were to receive 2 doses of Comirnaty (tozinameran) or placebo. The efficacy analyses included participants that received their second vaccination within 19 to 42 days after their first vaccination. The majority (93.1%) of vaccine recipients received the second dose 19 days to 23 days after Dose 1. Participants are planned to be followed for up to 24 months after Dose 2, for assessments of safety and efficacy against COVID-19. In the clinical study, participants were required to observe a minimum interval of 14 days before and after administration of an influenza vaccine in order to receive either placebo or Comirnaty (tozinameran). In the clinical study, participants were required to observe a minimum interval of 60 days before or after

receipt of blood/plasma products or immunoglobulins through to conclusion of the study in order to receive either placebo or Comirnaty (tozinameran).

The population for the analysis of the primary efficacy endpoint included 36,621 participants 12 years of age and older (18,242 in the Comirnaty (tozinameran) group and 18,379 in the placebo group) who did not have evidence of prior infection with SARS-CoV-2 through 7 days after the second dose. In addition, 134 participants were between the ages of 16 to 17 years of age (66 in the Comirnaty (tozinameran) group and 68 in the placebo group) and 1616 participants 75 years of age and older (804 in the Comirnaty (tozinameran) group and 812 in the placebo group).

At the time of the primary efficacy analysis, participants had been followed for symptomatic COVID-19 for in total 2,214 person-years for the Comirnaty (tozinameran) group and in total 2,222 person-years for the placebo group.

There were no meaningful clinical differences in overall vaccine efficacy in participants who were at risk of severe COVID-19 including those with 1 or more comorbidities that increase the risk of severe COVID-19 (e.g. asthma, body mass index (BMI) ≥30 kg/m^2, chronic pulmonary disease, diabetes mellitus, hypertension).

Comirnaty (tozinameran) efficacy information is presented in Table 5.

Table 5: Vaccine efficacy – First COVID-19 occurrence from 7 days after Dose 2, by age subgroup – participants without evidence of infection prior to 7 days after Dose 2 – evaluable efficacy (7 days) population

First COVID-19 occurrence from 7 days after Dose 2 in participants without evidence of prior SARS-CoV-2 infection*			
Subgroup	**Comirnaty** (tozinameran) **N[a] = 18,198** **Cases** n1[b] Surveillance time[c] (n2[d])	**Placebo** **N[a] = 18,325** **Cases** n1[b] Surveillance time[c] (n2[d])	**Vaccine efficacy** % (95% CI)[f]
All participants[e]	8 2.214 (17,411)	162 2.222 (17,511)	95.0 (90.0, 97.9)
16 to 64 years	7 1.706 (13,549)	143 1.710 (13,618)	95.1 (89.6, 98.1)
65 years and older	1 0.508 (3848)	19 0.511 (3880)	94.7 (66.7, 99.9)
65 to 74 years	1 0.406 (3074)	14 0.406 (3095)	92.9 (53.1, 99.8)
75 years and older	0 0.102 (774)	5 0.106 (785)	100.0 (-13.1, 100.0)

Note: Confirmed cases were determined by Reverse Transcription-Polymerase Chain Reaction (RT-PCR) and at least 1 symptom consistent with COVID-19 [*Case definition: (at least 1 of) fever, new or increased cough, new or increased shortness of breath, chills, new or increased muscle pain, new loss of taste or smell, sore throat, diarrhoea or vomiting.]

* Participants who had no serological or virological evidence (prior to 7 days after receipt of the last dose) of past SARS-CoV-2 infection (i.e., N-binding antibody [serum] negative at Visit 1 and SARS-CoV-2 not detected by nucleic acid amplification tests (NAAT) [nasal swab] at Visits 1 and 2), and had negative NAAT (nasal swab) at any unscheduled visit prior to 7 days after Dose 2 were included in the analysis.

a. N = number of participants in the specified group.

b. n1 = Number of participants meeting the endpoint definition.

c. Total surveillance time in 1000 person-years for the given endpoint across all participants within each group at risk for the endpoint. Time period for COVID-19 case accrual is from 7 days after Dose 2 to the end of the surveillance period.
d. n2 = Number of participants at risk for the endpoint.
e. No confirmed cases were identified in adolescents 12 to 15 years of age.
f. Two-sided confidence interval (CI) for vaccine efficacy (VE) is derived based on the Clopper and Pearson method adjusted to the surveillance time. CI not adjusted for multiplicity.

In the second primary analysis, efficacy of Comirnaty (tozinameran) in preventing first COVID-19 occurrence from 7 days after Dose 2 compared to placebo was 94.6% (95% credible interval of 89.9% to 97.3%) in participants 16 years of age and older with or without evidence of prior infection with SARS-CoV-2.

Additionally, subgroup analyses of the primary efficacy endpoint showed similar efficacy point estimates across genders, ethnic groups, and participants with medical comorbidities associated with high risk of severe COVID-19.

Updated efficacy analyses were performed with additional confirmed COVID-19 cases accrued during blinded placebo-controlled follow-up through 13 March 2021, representing up to 6 months of follow-up after Dose 2 for participants in the efficacy population.

The updated vaccine efficacy information is presented in Table 6.

Table 6: Vaccine efficacy – First COVID-19 occurrence from 7 days after Dose 2, by age subgroup – participants without evidence of infection prior to 7 days after Dose 2 – evaluable efficacy (7 days) population during the placebo-controlled follow-up period

First COVID-19 occurrence from 7 days after Dose 2 in participants without evidence of prior SARS-CoV-2 infection*			
Subgroup	**Comirnaty (tozinameran) N[a]=20,998 Cases n1[b] Surveillance Time[c] (n2[d])**	**Placebo N[a]=21,096 Cases n1[b] Surveillance Time[c] (n2[d])**	**Vaccine efficacy % (95% CI[e])**
All participants[f]	77 6.247 (20,712)	850 6.003 (20,713)	91.3 (89.0, 93.2)
16 to 64 years	70 4.859 (15,519)	710 4.654 (15,515)	90.6 (87.9, 92.7)
65 years and older	7 1.233 (4192)	124 1.202 (4226)	94.5 (88.3, 97.8)
65 to 74 years	6 0.994 (3350)	98 0.966 (3379)	94.1 (86.6, 97.9)
75 years and older	1 0.239 (842)	26 0.237 (847)	96.2 (76.9, 99.9)

Note: Confirmed cases were determined by Reverse Transcription-Polymerase Chain Reaction (RT-PCR) and at least 1 symptom consistent with COVID-19 (symptoms included: fever; new or increased cough; new or increased shortness of breath; chills; new or increased muscle pain; new loss of taste or smell; sore throat; diarrhoea; vomiting).

* Participants who had no evidence of past SARS-CoV-2 infection (i.e., N-binding antibody [serum] negative at Visit 1 and SARS-CoV-2 not detected by NAAT [nasal swab] at Visits 1 and 2), and had negative NAAT (nasal swab) at any unscheduled visit prior to 7 days after Dose 2 were included in the analysis.
a. N = Number of participants in the specified group.
b. n1 = Number of participants meeting the endpoint definition.
c. Total surveillance time in 1000 person-years for the given endpoint across all participants within each group at risk for the endpoint. Time period for COVID-19 case accrual is from 7 days after Dose 2 to the end of the surveillance period.

d. n2 = Number of participants at risk for the endpoint.
e. Two-sided confidence interval (CI) for vaccine efficacy is derived based on the Clopper and Pearson method adjusted to the surveillance time.
f. Included confirmed cases in participants 12 to 15 years of age: 0 in the Comirnaty (tozinameran) group (both without and with or without evidence of prior SARS-CoV-2 infection); 16 and 18 in the placebo group (without and with or without evidence of prior SARS-CoV-2 infection, respectively).

Efficacy against severe COVID-19 in participants 12 years of age or older – after 2 doses

As of 13 March 2021, vaccine efficacy against severe COVID-19 is presented only for participants with or without prior SARS-CoV-2 infection (Table 7) as the COVID-19 case counts in participants without prior SARS-CoV-2 infection were the same as those in participants with or without prior SARS-CoV-2 infection in both the Comirnaty (tozinameran) and placebo groups.

Table 7. Vaccine Efficacy – First Severe COVID-19 Occurrence in Participants With or Without* Prior SARS-CoV-2 Infection Based on Food and Drug Administration (FDA)† Definition After Dose 1 or From 7 Days After Dose 2 in the Placebo-Controlled Follow-up

	Comirnaty (tozinameran) Cases n1[a] Surveillance Time (n2[b])	Placebo Cases n1[a] Surveillance Time (n2[b])	Vaccine Efficacy % (95% CI[c])
After Dose 1[d]	1 8.439[e] (22,505)	30 8.288[e] (22,435)	96.7 (80.3, 99.9)
7 days after Dose 2[f]	1 6.522[g] (21,649)	21 6.404[g] (21,730)	95.3 (70.9, 99.9)

Note: Confirmed cases were determined by Reverse Transcription-Polymerase Chain Reaction (RT-PCR) and at least 1 symptom consistent with COVID-19 (symptoms included: fever; new or increased cough; new or increased shortness of breath; chills; new or increased muscle pain; new loss of taste or smell; sore throat; diarrhoea; vomiting).

* Participants who had no evidence of past SARS-CoV-2 infection (i.e., N-binding antibody [serum] negative at Visit 1 and SARS-CoV-2 not detected by NAAT [nasal swab] at Visits 1 and 2), and had negative NAAT (nasal swab) at any unscheduled visit prior to 7 days after Dose 2 were included in the analysis.

† Severe illness from COVID-19 as defined by FDA is confirmed COVID-19 and presence of at least 1 of the following:
- Clinical signs at rest indicative of severe systemic illness (respiratory rate ≥30 breaths per minute, heart rate ≥125 beats per minute, saturation of oxygen ≤93% on room air at sea level, or ratio of arterial oxygen partial pressure to fractional inspired oxygen <300 mm Hg);
- Respiratory failure [defined as needing high-flow oxygen, noninvasive ventilation, mechanical ventilation or extracorporeal membrane oxygenation (ECMO)];
- Evidence of shock (systolic blood pressure <90 mm Hg, diastolic blood pressure <60 mm Hg, or requiring vasopressors);
- Significant acute renal, hepatic, or neurologic dysfunction;
- Admission to an Intensive Care Unit;
- Death.

a. n1 = Number of participants meeting the endpoint definition.
b. n2 = Number of participants at risk for the endpoint.
c. Two-side confidence interval (CI) for vaccine efficacy is derived based on the Clopper and Pearson method adjusted to the surveillance time.
d. Efficacy assessed based on the Dose 1 all available efficacy (modified intention-to-treat) population that included all randomised participants who received at least 1 dose of study intervention.
e. Total surveillance time in 1000 person-years for the given endpoint across all participants within each group at risk for the endpoint. Time period for COVID-19 case accrual is from Dose 1 to the end of the surveillance period.
f. Efficacy assessed based on the evaluable efficacy (7 Days) population that included all eligible randomised participants who receive all dose(s) of study intervention as randomised within the predefined window, have no other important protocol deviations as determined by the clinician

g. Total surveillance time in 1000 person-years for the given endpoint across all participants within each group at risk for the endpoint. Time period for COVID-19 case accrual is from 7 days after Dose 2 to the end of the surveillance period.

Efficacy and immunogenicity in adolescents 12 to 15 years of age – after 2 doses

An analysis of Study C4591001 has been performed in adolescents 12 to 15 years of age up to a data cutoff date of 13 March 2021.

The vaccine efficacy information in adolescents 12 to 15 years of age is presented in Table 8.

Table 8: Vaccine efficacy – First COVID-19 occurrence from 7 days after Dose 2 – participants without evidence of infection and with or without evidence of infection prior to 7 days after Dose 2 – adolescents 12 to 15 years of age evaluable efficacy (7 days) population

First COVID-19 occurrence from 7 days after Dose 2 in adolescents 12 to 15 years of age without evidence of prior SARS-CoV-2 infection*			
	Comirnaty (tozinameran) N[a] = 1005 Cases n1[b] Surveillance time[c] (n2[d])	**Placebo N[a] = 978 Cases n1[b] Surveillance time[c] (n2[d])**	**Vaccine efficacy % (95% CI[e])**
Adolescents 12 to 15 years	0 0.154 (1001)	16 0.147 (972)	100.0 (75.3, 100.0)
First COVID-19 occurrence from 7 days after Dose 2 in adolescents 12 to 15 years of age with or without* evidence of prior SARS-CoV-2 infection			
	Comirnaty (tozinameran) N[a] = 1119 Cases n1[b] Surveillance time[c] (n2[d])	**Placebo N[a] = 1110 Cases n1[b] Surveillance time[c] (n2[d])**	**Vaccine efficacy % (95% CI[e])**
Adolescents 12 to 15 years	0 0.170 (1109)	18 0.163 (1094)	100.0 (78.1, 100.0)

Note: Confirmed cases were determined by Reverse Transcription-Polymerase Chain Reaction (RT-PCR) and at least 1 symptom consistent with COVID-19 [*Case definition: (at least 1 of) fever, new or increased cough, new or increased shortness of breath, chills, new or increased muscle pain, new loss of taste or smell, sore throat, diarrhoea or vomiting).

* Participants who had no serological or virological evidence (prior to 7 days after receipt of the last dose) of past SARS-CoV-2 infection (i.e, N-binding antibody [serum] negative at Visit 1 and SARS-CoV-2 not detected by nucleic acid amplification tests (NAAT) [nasal swab] at Visits 1 and 2), and had negative NAAT (nasal swab) at any unscheduled visit prior to 7 days after Dose 2 were included in the analysis.

a. N = number of participants in the specified group.
b. n1 = Number of participants meeting the endpoint definition.
c. Total surveillance time in 1000 person-years for the given endpoint across all subjects within each group at risk for the endpoint. Time period for COVID-19 case accrual is from 7 days after Dose 2 to the end of the surveillance period.
d. n2 = Number of subjects at risk for the endpoint.
e. Confidence interval (CI) for vaccine efficacy is derived based on the Clopper and Pearson method adjusted for surveillance time. CI not adjusted for multiplicity.

In Study C4591001 an analysis of SARS-CoV-2 neutralising titres in a randomly selected subset of participants was performed to demonstrate non-inferior immune responses (within 1.5-fold) comparing adolescents 12 to 15 years of age to participants 16 to 25 years of age who had no serological or virological evidence of past SARS-CoV-2 infection. The immune response to Comirnaty (tozinameran) in adolescents 12 to 15 years of age (n = 190) was non-

inferior to the immune response in participants 16 to 25 years of age (n = 170), based on results for SARS-CoV-2 neutralising titres at 1 month after Dose 2. The geometric mean titres (GMT) ratio of the adolescents 12 to 15 years of age group to the participants 16 to 25 years of age group was 1.76, with a 2-sided 95% CI of 1.47 to 2.10, meeting the 1.5-fold non-inferiority criterion (the lower bound of the 2-sided 95% CI for the geometric mean ratio [GMR] >0.67), which indicates a statistically greater response in the adolescents 12 to 15 years of age than that of participants 16 to 25 years of age.

An updated efficacy analysis of Study C4591001 has been performed in approximately 2,260 adolescents 12 to 15 years of age evaluating confirmed COVID-19 cases accrued up to a data cut-off date of 2 September 2021, representing up to 6 months of follow-up after Dose 2 for participants in the efficacy population.

The updated vaccine efficacy information in adolescents 12 to 15 years of age is presented in Table 9.

Table 9:Vaccine Efficacy – First COVID-19 Occurrence From 7 Days After Dose 2: Without Evidence of Infection and With or Without Evidence of Infection Prior to 7 Days After Dose 2 – Blinded Placebo-Controlled Follow-up Period, Adolescents 12 To 15 Years of Age Evaluable Efficacy (7 Days) Population

First COVID-19 occurrence from 7 days after Dose 2 in adolescents 12 to 15 years of age without evidence of prior SARS-CoV-2 infection*			
	Comirnaty (tozinameran) N[a]=1057 Cases n1[b] Surveillance Time[c] (n2[d])	**Placebo N[a]=1030 Cases n1[b] Surveillance Time[c] (n2[d])**	**Vaccine Efficacy % (95% CI[e])**
Adolescents 12 to 15 years of age	0 0.343 (1043)	28 0.322 (1019)	100.0 (86.8, 100.0)
First COVID-19 occurrence from 7 days after Dose 2 in adolescents 12 to 15 years of age with or without evidence of prior SARS-CoV-2 infection			
	Comirnaty (tozinameran) N[a]=1119 Cases n1[b] Surveillance Time[c] (n2[d])	**Placebo N[a]=1109 Cases n1[b] Surveillance Time[c] (n2[d])**	**Vaccine Efficacy % (95% CI[e])**
Adolescents 12 to 15 years of age	0 0.362 (1098)	30 0.345 (1088)	100.0 (87.5, 100.0)

Note: Confirmed cases were determined by Reverse Transcription-Polymerase Chain Reaction (RT-PCR) and at least 1 symptom consistent with COVID-19 (symptoms included: fever; new or increased cough; new or increased shortness of breath; chills; new or increased muscle pain; new loss of taste or smell; sore throat; diarrhoea; vomiting).

* Participants who had no evidence of past SARS-CoV-2 infection (i.e., N-binding antibody [serum] negative at Visit 1 and SARS-CoV-2 not detected by NAAT [nasal swab] at Visits 1 and 2), and had negative NAAT (nasal swab) at any unscheduled visit prior to 7 days after Dose 2 were included in the analysis.

a. N = Number of participants in the specified group.

b. n1 = Number of participants meeting the endpoint definition.

c. Total surveillance time in 1000 person-years for the given endpoint across all participants within each group at risk for the endpoint. Time period for COVID-19 case accrual is from 7 days after Dose 2 to the end of the surveillance period.

d. n2 = Number of participants at risk for the endpoint.

e. Two-sided confidence interval (CI) for vaccine efficacy is derived based on the Clopper and Pearson method adjusted for surveillance time.

Immunogenicity in participants 18 years of age and older – after booster dose

Effectiveness of a booster dose of Comirnaty (tozinameran) was based on an assessment of 50% neutralising titres (NT50) against SARS-CoV-2 (USA_WA1/2020). In Study C4591001, analyses of NT50 1 month after the booster dose compared to 1 month after the primary series in individuals 18 to 55 years of age who had no serological or virological evidence of past SARS-CoV-2 infection up to 1 month after the booster vaccination demonstrated noninferiority for both GMR and difference in seroresponse rates. Seroresponse for a participant was defined as achieving a ≥4-fold rise in NT50 from baseline (before Dose 1), These analyses are summarised in Table 10.

Table 10. SARS-CoV-2 neutralisation assay - NT50 (titre)† (SARS-CoV-2 USA_WA1/2020) – GMT and seroresponse rate comparison of 1 month after booster dose to 1 month after primary series – participants 18 to 55 years of age without evidence of infection up to 1 month after booster dose* – booster dose evaluable immunogenicity population±

	n	1 month after booster dose (95% CI)	1 month after primary series (95% CI)	1 month after booster dose/- 1 month after primary series (97.5% CI)	Met noninferiority objective (Y/N)
Geometric mean 50% neutralising titre (GMT[b])	212[a]	2466.0[b] (2202.6, 2760.8)	755.7[b] (663.1, 861.2)	3.26[c] (2.76, 3.86)	Y[d]
Seroresponse rate (%) for 50% neutralising titre[†]	200[e]	199[f] 99.5% (97.2%, 100.0%)	190[f] 95.0% (91.0%, 97.6%)	4.5%[g] (1.0%, 7.9%[h])	Y[i]

Abbreviations: CI = confidence interval; GMR = geometric mean ratio; GMT = geometric mean titre; LLOQ = lower limit of quantitation; N-binding = SARS-CoV-2 nucleoprotein-binding; NAAT = nucleic acid amplification test; NT50 = 50% neutralising titre; SARS-CoV-2 = severe acute respiratory syndrome coronavirus 2; Y/N = yes/no.

† SARS-CoV-2 NT50 were determined using the SARS-CoV-2 mNeonGreen Virus Microneutralisation Assay. The assay uses a fluorescent reporter virus derived from the USA_WA1/2020 strain and virus neutralisation is read on Vero cell monolayers. The sample NT50 is defined as the reciprocal serum dilution at which 50% of the virus is neutralised.

* Participants who had no serological or virological evidence (up to 1 month after receipt of a booster dose of Comirnaty) of past SARS-CoV-2 infection (i.e., N-binding antibody [serum] negative and SARS-CoV-2 not detected by NAAT [nasal swab]) and had a negative NAAT (nasal swab) at any unscheduled visit up to 1 month after the booster dose were included in the analysis.

± All eligible participants who had received 2 doses of Comirnaty (tozinameran) as initially randomised, with Dose 2 received within the predefined window (within 19 to 42 days after Dose 1), received a booster dose of Comirnaty (tozinameran), had at least 1 valid and determinate immunogenicity result after booster dose from a blood collection within an appropriate window (within 28 to 42 days after the booster dose), and had no other important protocol deviations as determined by the clinician.

a. n = Number of participants with valid and determinate assay results at both sampling time points within specified window.

b. GMTs and 2-sided 95% CIs were calculated by exponentiating the mean logarithm of the titres and the corresponding CIs (based on the Student t distribution). Assay results below the LLOQ were set to 0.5 × LLOQ.

c. GMRs and 2-sided 97.5% CIs were calculated by exponentiating the mean differences in the logarithms of the assay and the corresponding CIs (based on the Student t distribution).

d. Noninferiority is declared if the lower bound of the 2-sided 97.5% CI for the GMR is > 0.67 and the point estimate of the GMR is ≥ 0.80.

e. n = Number of participants with valid and determinate assay results for the specified assay at baseline, 1 month after Dose 2 and 1 month after the booster dose within specified window. These values are the denominators for the percentage calculations.

f. Number of participants with seroresponse for the given assay at the given dose/sampling time point. Exact 2-sided CI based on the Clopper and Pearson method.
g. Difference in proportions, expressed as a percentage (1 month after booster dose – 1 month after Dose 2).
h. Adjusted Wald 2-sided CI for the difference in proportions, expressed as a percentage.
i. Noninferiority is declared if the lower bound of the 2-sided 97.5% CI for the percentage difference is > -10%.

Relative vaccine efficacy in participants 16 years of age and older – after booster dose

An interim efficacy analysis of Study C4591031, a placebo-controlled booster study, was performed in approximately 10,000 participants 16 years of age and older who were recruited from Study C4591001, evaluated confirmed COVID-19 cases accrued from at least 7 days after booster vaccination up to a data cut-off date of 8 February 2022 (a period when Delta and then Omicron was the predominant variant), which represents a median of 2.8 months (range 0.3 to 7.5 months) post-booster follow-up. Vaccine efficacy of the Comirnaty (tozinameran) booster dose after the primary series relative to the placebo booster group who only received the primary series dose was assessed. The relative vaccine efficacy information for participants 16 years of age and older is presented in Table 11.

Table 11: Vaccine Efficacy – First COVID-19 Occurrence From 7 Days After Booster Vaccination – Participants 16 Years of Age and Older Without Evidence of Infection and Participants With or Without Evidence of Infection Prior to 7 Days After Booster Vaccination – Evaluable Efficacy Population

First COVID-19 occurrence from 7 days after booster dose in participants without evidence of prior SARS-CoV-2 infection*			
	Comirnaty (tozinameran) N[a]=4689 Cases n1[b] Surveillance Time[c] (n2[d])	**Placebo N[a]=4664 Cases n1[b] Surveillance Time[c] (n2[d])**	**Relative Vaccine Efficacy[e] % (95% CI[f])**
First COVID-19 occurrence from 7 days after booster vaccination	63 1.098 (4639)	148 0.932 (4601)	63.9 (51.1, 73.5)
First COVID-19 occurrence from 7 days after booster dose in participants with or without evidence of prior SARS-CoV-2 infection			
	Comirnaty (tozinameran) N[a]=4977 Cases n1[b] Surveillance Time[c] (n2[d])	**Placebo N[a]=4942 Cases n1[b] Surveillance Time[c] (n2[d])**	**Relative Vaccine Efficacy[e] % (95% CI[f])**
First COVID-19 occurrence from 7 days after booster vaccination	67 1.173 (4903)	150 0.989 (4846)	62.4 (49.5, 72.2)

Note: Confirmed cases were determined by Reverse Transcription-Polymerase Chain Reaction (RT-PCR) and at least 1 symptom consistent with COVID-19 (symptoms included: fever; new or increased cough; new or increased shortness of breath; chills; new or increased muscle pain; new loss of taste or smell; sore throat; diarrhoea; vomiting).

* Participants who had no serological or virological evidence (prior to 7 days after receipt of the booster vaccination) of past SARS-CoV-2 infection (i.e., N-binding antibody [serum] negative at Visit 1 and SARS-CoV-2 not detected by NAAT [nasal swab] at Visit 1, and had a negative NAAT [nasal swab] at any unscheduled visit prior to 7 days after booster vaccination) were included in the analysis.
a. N = Number of participants in the specified group.
b. n1 = Number of participants meeting the endpoint definition.
c. Total surveillance time in 1000 person-years for the given endpoint across all participants within each group at risk for the endpoint. Time period for COVID-19 case accrual is from 7 days after the booster vaccination to the end of the surveillance period.

d. n2 = Number of participants at risk for the endpoint.
e. Relative vaccine efficacy of the Comirnaty (tozinameran) booster group relative to the placebo group (non-booster).
f. Two-sided confidence interval (CI) for relative vaccine efficacy is derived based on the Clopper and Pearson method adjusted for surveillance time.

Immunogenicity in pregnant women and infants born to maternal participants – after 2 doses with Comirnaty (tozinameran)

Study C4591015 was a Phase 2/3 multinational, placebo-controlled, observer-blind study that enrolled pregnant women 18 years of age and older to receive 2 doses of Comirnaty (tozinameran) (n=173) or placebo (n=173). Pregnant women received Dose 1 of Comirnaty (tozinameran) at 24 to 34 weeks gestation and the majority (90.2%) received the second dose 19 to 23 days after Dose 1.

Descriptive immunogenicity analysis was performed in pregnant women receiving Comirnaty (tozinameran) in Study C4591015 compared to a comparator subset of nonpregnant women from Study C4591001 evaluating the ratio of the neutralising GMT (GMR) 1 month after Dose 2.

The evaluable immunogenicity population who received Comirnaty (tozinameran) in the maternal participants group in Study C4591015 (n=111) and in nonpregnant participants in Study C4591001 (n=114) comprised of 69.4% vs. 82.5% White, 27.0% vs. 5.3% Black or African American, 1.8% vs. 6.1% Asian, 0 vs 4.4% multiracial participants, 37.8% vs 34.2% Hispanic/Latino, 37.8% vs 3.5% had a positive baseline SARS-CoV-2 status, and 38.7% vs 27.2% were obese [BMI $\geq$30 kg/m^2 (pre-pregnancy weight in participants in Study C4591015)], respectively. In maternal participants group in Study C4591015 and in nonpregnant participants in Study C4591001 who received Comirnaty (tozinameran), the median age was 30 years (range 18 to 44 years of age) in both groups.

The immunogenicity results after 2 doses of Comirnaty (tozinameran) in pregnant women 18 years of age and older are presented in Table 12.

Table 12. Geometric Mean Ratios – Participants Without* or With or Without Evidence of Infection up to 1 Month After Dose 2 – Maternal Participants (Study C4591015) and Nonpregnant Female Participants (Study C4591001) – Evaluable Immunogenicity Population

Participants Without Evidence of Infection*						
		Comirnaty (tozinameran)				
		Study C4591015 Pregnant Women		Study C4591001 Nonpregnant Women		Pregnant/ Nonpregnant
Assay	Dose/ Sampling Time Point[b]	n[c]	GMT[d] (95% CI[d])	n[c]	GMT[d] (95% CI[d])	GMR[e] (95% CI)[e]
SARS-CoV-2 neutralisation assay - NT50 (titre)[a]	2/1 month	58	1109.2 (849.2, 1448.9)	107	1663.7 (1411.5, 1960.8)	0.67 (0.50, 0.90)

Participants With or Without Evidence of Infection						
		Comirnaty (tozinameran)				
		Study C4591015 Pregnant Women		Study C4591001 Nonpregnant Women		Pregnant/ Nonpregnant
Assay	Dose/ Sampling Time Point[b]	nf	GMT[g] (95% CI[g])	n[f]	GMT[g] (95% CI[g])	GMR[h] (95% CI)[h]
SARS-CoV-2 neutralisation assay - NT50 (titre)[a]	2/1 month	99	1900.0 (1518.2, 2377.7)	113	2005.7 (1627.0, 2472.6)	0.95 (0.69, 1.30)

Abbreviations: CI = confidence interval; GMR = geometric mean ratio; GMT = geometric mean titre; LLOQ = lower limit of quantitation; LS = least square; N-binding = SARS-CoV-2 nucleoprotein–binding; NAAT = nucleic acid amplification test; NT50 = 50% neutralising titre; SARS-CoV-2 = severe acute respiratory syndrome coronavirus 2.

Note: Participants from Study 2 are a selected subset of age matched nonpregnant female Phase 3 participants.

* Participants who had no serological or virological evidence (prior to the 1 month after Dose 2 blood sample collection) of past SARS-CoV-2 infection (i.e., N-binding antibody [serum] negative at Dose 1 and 1 month after Dose 2 and no positive result between visits, negative NAAT [nasal swab] at Dose 1, Dose 2, and any unscheduled visit prior to the 1 month after Dose 2 blood sample collection) were included in the analysis.

a. SARS-CoV-2 NT50 were determined using a validated 384-well assay platform (original strain [USA-WA1/2020, isolated in January 2020]).

b. Protocol-specified timing for blood sample collection.

c. n = Number of participants with valid and determinate assay results for the specified assay at the given dose/sampling time point.

d. GMTs and 2-sided 95% CIs were calculated by exponentiating the mean logarithm of the titres and the corresponding CIs (based on the Student t distribution). Assay results below the LLOQ were set to 0.5 × LLOQ.

e. GMR and 2-sided 95% CIs were calculated by exponentiating the mean difference of the logarithms of the assay and the corresponding CIs (based on the Student t distribution).

f. n = Number of participants with valid and determinate assay results for the specified assay at both baseline and the given dose/sampling time point.

g. GMTs and 2-sided CIs were calculated by exponentiating the LS means and the corresponding CIs based on analysis of log-transformed NT50 titres using a regression model with group, age at Dose 1 in years (continuous), and baseline log-transformed NT50 titres.

h. GMR (ratio of GMTs of pregnant women to nonpregnant women) and 2-sided CIs were calculated by exponentiating the difference of LS means and the corresponding CIs based on the same regression model as above.

Among participants without prior evidence of SARS-CoV-2 infection up to 1 month after Dose 2 (evaluable immunogenicity population), the ratio of the neutralising GMTs (GMR) in Study C4591015 maternal participants in the BNT162b2 (30 µg) group to that of Study C4591001 nonpregnant females who received BNT162b2 30 µg was 0.67 (95% CI: 0.50, 0.90).

For participants with or without prior evidence of SARS-CoV-2 infection up to 1 month after Dose 2 (evaluable immunogenicity population), the model-adjusted ratio of the neutralising GMTs (adjusted GMR) in Study C4591015 maternal participants in the BNT162b2 (30 µg) group to that of Study C4591001 nonpregnant females who received BNT162b2 30 µg was 0.95 (95% CI: 0.69, 1.30). The model-adjusted GMT and GMR were calculated based on a regression model adjusting for age and baseline neutralising titres.

In an additional descriptive immunogenicity analysis, infants born to maternal participants who received COMIRNATY (tozinameran) had higher geometric mean concentrations (GMCs) of full length S-binding immunoglobulin G (IgG) concentrations at birth and at 6 months after delivery [5576.4 (95% CI: 4246.2, 7323.2); n=91 and 311.1 (95% CI: 235.8, 410.5); n=83], respectively, compared to infants born to maternal participants from the placebo group [19.4 (95% CI: 10.2, 37.0); n=92 and 22.0 (95% CI: 11.4, 42.7); n=69].

Immunogenicity in immunocompromised participants (adults and children)

Study C4591024 is a Phase 2b, open-label study (n=124) that enrolled immunocompromised participants 2 to 17 years of age receiving immunomodulator therapy or who have undergone solid organ transplant (within the previous 3 months) and are on immunosuppression or who have undergone bone marrow or stem cell transplant at least 6 months prior to enrollment. Study C4591024 also enrolled immunocompromised participants 18 years of age and older treated for NSCLC or CLL, receiving hemodialysis for secondary to end-stage renal disease, or receiving immunomodulator therapy for an autoimmune inflammatory disorder. Study participants did not have a past clinical or microbiological diagnosis of COVID-19. Participants received 4 age-appropriate doses of Comirnaty (tozinameran) (3 micrograms, 10 micrograms, or 30 micrograms); the first 2 doses separated by 21 days, with the third dose occurring 28 days after the second dose, followed by a fourth dose, 3 to 6 months after Dose 3.

The immunogenicity results pre-vaccination and after 3 and 4 doses of Comirnaty (tozinameran) in immunocompromised participants 2 years of age and older are presented in Table 13.

Table 13. Summary of Geometric Mean Titres – Participants With or Without Evidence of Infection by Age Group – All-Available Immunogenicity Population

		Comirnaty (tozinameran)							
		3 micrograms Age Group: 2 to 4 Years		10 micrograms Age Group: 5 to 11 Years		30 micrograms Age Group: 12 to 17 Years		30 micrograms Age Group: ⩾18 Years	
Assay	Dose/ Sampling Time Point[b]	n[c]	GMT[c] (95% CI[d])	n[c]	GMT[c] (95% CI[d])	n[c]	GMT[c] (95% CI[d])	n[c]	GMT[c] (95% CI[d])
SARS-CoV-2 neutralisation assay – reference strain – NT50 (titre)[a]	1/Prevax	32	44.8 (42.2, 47.7)	62	44.5 (42.5, 46.5)	14	54.2 (33.7, 87.0)	6	82.2 (16.0, 422.5)
	3/1 Month	32	942.3 (537.1, 1653.4)	60	1566.5 (1019.9, 2405.9)	14	2940.6 (1175.5, 7356.0)	6	787.1 (66.5, 9321.5)
	4/Pre-Dose 4	29	487.8 (269.0, 884.9)	57	922.2 (586.7, 1449.3)	11	3284.5 (1609.8, 6701.3)	3	606.2 (5.3, 68756.0)
	4/1 Month	26	3447.0 (1851.0, 6419.2)	50	6463.4 (4319.7, 9670.9)	9	13457.1 (5270.1, 34362.4)	4	1031.3 (56.9, 18681.7)
	4/6 Months	25	1296.7 (674.2, 2494.0)	49	2382.3 (1554.3, 3651.2)	8	5776.1 (2801.4, 11909.2)	3	1605.6 (28.5, 90614.9)

Abbreviations: CI = confidence interval; GMT = geometric mean titre; LLOQ = lower limit of quantitation; NT50 = 50% neutralising titre; Prevax = before vaccination; SARS-CoV-2 = severe acute respiratory syndrome coronavirus 2.

a. SARS-CoV-2 NT50 were determined using a validated 384-well assay platform (original strain [USA-WA1/2020, isolated in January 2020]).
b Protocol-specified timing for blood sample collection.
c. n = Number of participants with valid and determinate assay results for the specified assay at the given dose/sampling time point.
d. GMTs and 2-sided 95% CIs were calculated by exponentiating the mean logarithm of the titres and the corresponding CIs (based on the Student t distribution). Assay results below the LLOQ were set to 0.5 × LLOQ.

Analysis of immunogenicity data at 1 month after Dose 3 (32 participants 2 to 4 years of age, 60 participants 5 to 11 years of age, 14 participants 12 to 17 years of age, and 6 participants 18 years of age and older) and 1 month after Dose 4 (26 participants 2 to 4 years of age, 50 participants 5 to 11 years of age, 9 participants 12 to 17 years of age, and 4 participants 18

years of age and older) in the all available immunogenicity population with or without evidence of prior infection demonstrated a vaccine-elicited immune response.

GMTs were observed to be substantially higher at 1 month after Dose 3 and further increased at 1 month after Dose 4 and remained high at 6 months after Dose 4 compared to levels observed before study vaccination across age groups and disease subsets.

Concomitant vaccine administration with influenza vaccine

In Study C4591030, a Phase 3 multicentre, randomised, observer-blind study, 1,134 participants 18 to 64 years of age who had received 3 doses of Comirnaty (tozinameran) at least 3 months prior were randomised in a 1:1 ratio to receive either Comirnaty (tozinameran) coadministered with a SIIV, quadrivalent (Afluria Quad) followed 1 month later by placebo (Group 1, n=568) or an inactivated influenza vaccine with placebo followed 1 month later with Comirnaty (tozinameran) (Group 2, n=566).

The immune responses to Comirnaty (tozinameran) and SIIV were similar after Comirnaty (tozinameran) administered concomitantly with SIIV compared with those elicited by either vaccine administered alone. The non-inferiority criterion was achieved for both full-length S-binding immunoglobulin G (IgG) and all 4 influenza strain-specific hemagglutination inhibition (HAI) titres.

The immunogenicity results are presented in Table 14 and Table 15.

Table 14. Geometric Mean Ratio for Full-Length S-Binding IgG Levels (U/mL) at 1 Month After Comirnaty (tozinameran) Vaccination – Evaluable Immunogenicity Population

	Vaccine Group (as Randomised)				Coadministration Group/Separate Administration Group
	Coadministration Group		Separate-Administration Group		
Assay	n[a]	GMC[b] (95% CI[b])	n[a]	GMC[b] (95% CI[b])	GMR[c] (95% CI[c])
Full-length S-binding IgG (U/mL)	499	13806.5 (12838.9, 14847.0)	413	16254.6 (15035.5, 17572.5)	0.83 (0.77, 0.89)

Abbreviations: CI = confidence interval; GMC = geometric mean concentration; GMR = geometric mean ratio; IgG = immunoglobulin G; LLOQ = lower limit of quantitation; LS Means = least squares means; S = spike protein.
Note: The baseline was defined as Visit 1 for the coadministration group and Visit 2 for the separate-administration group.

a. n = Number of participants with valid and determinate assay results for the specified assay at the given sampling time point.
b. GMC and the 2-sided 95% CI were calculated by exponentiating the concentrations and the corresponding CIs (based on the Student t distribution). Assay results below the LLOQ were set to 0.5 × LLOQ.
c. GMR and the corresponding 2-sided 95% CI were calculated by exponentiating the difference in LS Means and the corresponding CIs based on analysis of logarithmically transformed assay results using a linear regression model with terms of vaccine group, age group, and the corresponding baseline assay results (log scale). Noninferiority is declared if the lower bound of the 2-sided 95% CI for the GMR is greater than 0.67.

Table 15. Geometric Mean Ratio for Strain-Specific HAI Titres at 1 Month After SIIV Vaccination – Evaluable SIIV Immunogenicity Population

	Vaccine Group (as Randomised)				Coadministration Group/Separate Administration Group
	Coadministration Group		Separate Administration Group		
Strain	n[a]	GMT[b] (95% CI[b])	n[a]	GMT[b] (95% CI[b])	GMR[c] (95% CI[c])
B/Austria	514	72.4 (64.2, 81.7)	491	78.3 (69.3, 88.5)	0.89 (0.77, 1.04)
B/Phuket	520	87.4 (79.7, 95.7)	496	86.3 (78.4, 94.9)	1.00 (0.89, 1.13)
H1N1 A/Victoria	516	344.3 (312.4, 379.3)	492	362.3 (326.3, 401.6)	0.95 (0.83, 1.09)
H3N2 A/Darwin	519	230.6 (209.5, 253.8)	491	242.2 (221.2, 265.2)	0.96 (0.85, 1.09)

Abbreviations: CI = confidence interval; GMR = geometric mean ratio; GMT = geometric mean titre; HAI = hemagglutination inhibition; LLOQ = lower limit of quantitation; LS Means = least squares means; SIIV = seasonal inactivated influenza vaccine; ULOQ = upper limit of quantitation.

Note: The baseline for the SIIV assay was defined at Visit 1.

a. n = Number of participants with valid and determinate assay results for the specified assay at the given sampling time point.

b. GMTs and the 2-sided 95% CIs were calculated by exponentiating the titres and the corresponding CIs (based on the Student t distribution). Assay results below the LLOQ were set to 0.5 × LLOQ, and results above the ULOQ were set to ULOQ + 1.

c. GMRs and the corresponding 2-sided 95% CI were calculated by exponentiating the difference in LS Means and the corresponding CIs based on analysis of logarithmically transformed assay results using a linear regression model with terms of vaccine group, age group, and the corresponding baseline assay results (log scale). Noninferiority is declared if the lower bound of the 2-sided 95% CI for the GMR is greater than 0.67.

Concomitant administration with pneumococcal conjugate vaccine

In Study B7471026, a double-blind, randomised descriptive study, participants 65 years of age and older who had received 2 doses of Comirnaty (tozinameran) at least 6 months earlier, were randomised in a 1:1:1 ratio to receive either 20vPnC concomitantly administered with a booster dose of Comirnaty (tozinameran) (n=190), or 20vPnC vaccine administered alone (n=191), or a booster dose of Comirnaty (tozinameran) administered alone (n=189).

Immune responses to both vaccines were observed after concomitant administration of 20vPnC vaccine and Comirnaty (tozinameran). Opsonophagocytic activity (OPA) GMTs for the 20 pneumococcal serotypes were similar to 20vPnC vaccine administered alone and IgG GMCs for the full-length S−binding protein were similar to Comirnaty (tozinameran) administered alone. A post-hoc analysis found the immune responses to all 20 serotypes elicited by 20vPnC vaccine when concomitantly administered with Comirnaty (tozinameran) would have met conventional 2-fold noninferiority criteria compared to 20vPnC vaccine alone, and the full-length S-binding IgG GMC elicited by Comirnaty (tozinameran) would have met conventional 1.5-fold noninferiority criteria compared to Comirnaty (tozinameran) alone.

Concomitant administration with an RSV vaccine or with an RSV vaccine and a high dose influenza vaccine

In Study C5481001, a Phase 1/2, randomised, multicentre, parallel group, observer-blinded study 1,083 participants 65 years of age and older who had previously received at least 3 prior doses of an mRNA COVID-19 vaccine, had not previously received any RSV vaccine, or an

influenza vaccine in the ≤120 days prior to enrolment, were randomised in 1 of 2 enrolment strata.

The first stratum of approximately 750 participants were randomised 1:1 to evaluate the safety, tolerability, and immunogenicity of admixed Comirnaty Original/Omicron BA.4-5 (tozinameran/famtozinameran) and RSV (bivalent, recombinant) vaccine concomitantly administered with high dose quadrivalent flu vaccine or placebo in the opposite arm, compared to the individual vaccines.

In the second stratum (total participants n=316) participants were randomised 1:1 to receive Comirnaty Original/Omicron BA.4-5 with concomitantly administered RSV (bivalent, recombinant) vaccine (in one arm) with either placebo or high dose quadrivalent flu vaccine (opposite arm). The study objectives included assessing the impact on the immune response of Comirnaty Original/Omicron BA.4-5 concomitantly administered with RSV (bivalent, recombinant) vaccine, the immune response of concomitant use of RSV (bivalent, recombinant) vaccine, Comirnaty Original/Omicron BA.4-5, and high dose quadrivalent flu vaccine.

When Comirnaty Original/Omicron BA.4-5 was concomitantly administered with RSV (bivalent, recombinant) vaccine immunologic noninferiority was demonstrated for Comirnaty Original/Omicron BA.4-5 and RSV (bivalent, recombinant) vaccine compared to individual administration. The lower limit of the 2-sided 97.5% CI for the GMR for RSV A, RSV B, both SARS−CoV−2 Omicron BA.4/BA.5 strain and SARS−COV−2 Wuhan-Hu-1 strain (wildtype) reference strain neutralising titres (NTs) all met the predefined 2-fold noninferiority criterion.

When Comirnaty Original/Omicron BA.4-5 and RSV (bivalent, recombinant) vaccine were concomitantly administered with high dose quadrivalent flu vaccine, immunologic noninferiority was demonstrated for Comirnaty Original/Omicron BA.4-5, RSV (bivalent, recombinant) vaccine and high dose quadrivalent flu vaccine group compared to each individual administration. The lower limit of the 2-sided 97.5% CI for the GMR for RSV A, RSV B, both SARS−CoV−2 Omicron BA.4/BA.5 strain and SARS−COV−2 Wuhan-Hu-1 strain (wildtype) reference strain NTs, and each of the 4 strain specific HAI titres all met the predefined 2-fold noninferiority criterion.

5.2 Pharmacokinetic properties

Not applicable.

5.3 Preclinical safety data

Genotoxicity/Carcinogenicity

Neither genotoxicity nor carcinogenicity studies were performed. The components of Comirnaty (lipids and mRNA) are not expected to have genotoxic potential.

6. PHARMACEUTICAL PARTICULARS

6.1 List of excipients

((4-hydroxybutyl)azanediyl)bis(hexane-6,1-diyl)bis(2-hexyldecanoate) (ALC-0315)

2-[(polyethylene glycol)-2000]-N,N-ditetradecylacetamide (ALC-0159)

1,2-Distearoyl-sn-glycero-3-phosphocholine (DSPC)

Cholesterol

Trometamol

Trometamol hydrochloride

Sucrose

Water for injections

6.2 Incompatibilities

This medicinal product must not be mixed with other medicinal products except those mentioned in Section 6.6 Special precautions for disposal and other handling.

6.3 Shelf life

Unopened vial

Frozen vial

18 months when stored at -90°C to -60°C.

The vaccine will be received frozen at -90°C to -60°C. Frozen vaccine can be stored either at -90°C to -60°C or 2°C to 8°C upon receipt.

For thawing instructions of the frozen vials, see Section 6.6 Special precautions for disposal and other handling.

Thawed vial

If the vaccine is received at 2°C to 8°C it should be stored at 2°C to 8°C. Once removed from frozen storage, the unopened vial may be stored refrigerated at 2°C to 8°C for a single period of up to 10 weeks within the 18 month shelf life.

Upon moving the product to 2°C to 8°C storage, the updated expiry date must be written on the outer carton and the vaccine should be used or discarded by the updated expiry date. The original expiry date should be crossed out.

Check that the expiry date on the outer carton has been updated to reflect the refrigerated expiry date and that the original expiry date has been crossed out.

Prior to use, the unopened vials can be stored for up to 12 hours at temperatures between 8ºC to 30ºC.

Thawed vials can be handled in room light conditions.

Once thawed, the vaccine should not be re-frozen.

Opened vial

Chemical and physical in-use stability has been demonstrated for 12 hours at 2ºC to 30ºC. From a microbiological point of view, unless the method of opening precludes the risks of microbial contamination, the product should be used immediately after the first puncture. If not used immediately, in-use storage times and conditions are the responsibility of the user.

Pre-filled syringes

Glass pre-filled syringes

The vaccine will be received and stored at 2 °C to 8 °C (refrigerated only).

12 months when stored at 2°C to 8°C Do not freeze. Prior to use, pre-filled syringes can be stored for up to 12 hours at temperatures between 8 °C and 30 °C and can be handled in room light conditions.

6.4 Special precautions for storage

Vials

Store multidose vials a in a freezer at −90 °C to −60 °C.

Glass pre-filled syringes

Store glass pre-filled syringes at 2 °C to 8 °C. DO NOT FREEZE.

Vials and pre-filled syringes

Store the vaccine in the original package in order to protect from light. During storage, minimise exposure to room light, and avoid exposure to direct sunlight and ultraviolet light. For storage conditions after thawing and first opening, see Section 6.3 Shelf life.

For additional advice on storing Comirnaty LP.8.1, contact Pfizer New Zealand on 0800 736 363.

6.5 Nature and contents of container

Comirnaty LP.8.1 (Dark Grey cap) 2.25 mL fill volume, 2 mL clear multidose vial (Type I glass) with a stopper (synthetic bromobutyl rubber) and a Dark Grey flip-off plastic cap with aluminium seal. Each vial contains 6 doses of 0.3 mL, see Section 6.6 Special precautions for disposal and other handling.

Pack size: 10 vials

Comirnaty LP.8.1 Prefilled Glass Syringe: 1 mL clear glass syringe (Type I glass) with polypropylene rigid cap with a 1 mL plunger stopper (bromobutyl elastomer). Each prefilled glass syringe contains 1 dose.

Pack size: 1 and 10 Prefilled glass syringes

6.6 Special precautions for disposal and other handling

Comirnaty LP.8.1 Suspension for Injection

Handling Instructions for Vaccines in Vials

Handing prior to use
Frozen vials must be completely thawed prior to use. Frozen vials should be transferred to 2 °C to 8 °C to thaw. Thaw times for 10-vial packs are noted in table below:

Vial Cap Color	Time That May Be Required For a 10-vial Pack to Thaw (at 2 °C to 8 °C)
Dark Grey	6 hours

- Upon moving frozen vaccine to 2 °C to 8 °C storage, update the expiry date on the carton. The updated expiry date should reflect 10 weeks from the date of transfer to refrigerated conditions (2 °C to 8 °C) and not exceeding the original printed expiry date (EXP).
- Alternatively, individual frozen vials may be thawed for 30 minutes at temperatures up to 30 °C for immediate use.
- If the vaccine is received at 2 °C to 8 °C it should continue to be stored at 2 °C to 8 °C. Check that the carton has been previously updated to reflect the 10-week refrigerated expiry date.
- Unopened vials can be stored for up to 12 hours at temperatures up to 30 °C. Total storage time between 8 ºC to 30 ºC, inclusive of storage before and after puncture, should not exceed 24 hours.

Comirnaty LP.8.1 - Suspension for Injection

Preparation for administration
Comirnaty LP.8.1 Suspension for Injection should be prepared by a healthcare professional using aseptic technique to ensure the sterility of the prepared suspension.

Vials of Comirnaty LP.8.1 Suspension for Injection have a grey cap, containing 6 doses of 0.3 mL of vaccine and **do not require dilution**.

- Dark Grey cap: 6 dose multidose vial

Vial verification
Prior to administration, check the name and strength of the vaccine on the vial label and the colour of the vial cap and vial label border to ensure it is the intended presentation. Check whether the vial is a single dose vial or a multidose vial and check if the vial requires dilution.

- Check appearance of vaccine prior to mixing and administration.
  - Grey cap vials: Prior to mixing, the vaccine is a white to off-white dispersion and may contain white to off-white opaque amorphous particles.
- Gently invert the vial 10 times. **Do not shake.**
- Do not use the vaccine if particulates or discoloration are present after mixing.

Preparation of individual doses

- Using aseptic technique, cleanse the vial stopper with a single-use antiseptic swab.
- Withdraw a 0.3 mL single dose.
- *For Dark Grey multidose vials (6 doses per vial):*

- After first puncture, record appropriate date and time on the vial and store at 2 ºC to 30 ºC for up to 12 hours. Do not re-freeze.
- Each dose must contain 0.3 mL of vaccine. Low dead-volume syringes and/or needles should be used in order to extract all doses from a single vial. The low dead-volume syringe and needle combination should have a dead volume of no more than 35 microlitres.
- If the amount of vaccine remaining in the vial cannot provide a full dose, discard the vial and any excess volume.

Handling Instructions for Vaccines in Prefilled Syringes

Glass pre-filled syringes

- Prior to use, pre-filled syringes can be stored for up to 12 hours at temperatures between 8 °C to 30 °C and can be handled in room light conditions.

Remove tip cap by slowly turning the cap counterclockwise. Do not shake. Attach a needle appropriate for intramuscular injection and administer the entire volume.

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

7. MEDICINE SCHEDULE

Prescription Medicine.

8. SPONSOR

Pfizer New Zealand Limited
P O Box 3998
Auckland, New Zealand

Toll Free Number: 0800 736 363

9. DATE OF FIRST APPROVAL

Date of publication in the New Zealand Gazette of consent to distribute this medicine:

30 October 2025

10. DATE OF REVISION OF THE TEXT

15 January 2026

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Summary of Updates

Section	Update
6.5	Additional pack size for Prefilled syringe