Clinical trial results:
Assessment of the immunogenicity and safety of marketed vaccines for COVID-19 after regular schedule and adapted vaccine schedules and routes: BNT162b2 (Comirnaty®; Pfizer-BioNTech), mRNA-1273 Vaccine (COVID-19 Vaccine Moderna®; Moderna) and COVID-19 Vaccine (ChAdOx1-S [recombinant])(Vaxzevria®, AstraZeneca)

Summary

EudraCT number	2021-001993-52
Trial protocol	BE
Global end of trial date	08 July 2022

Results information

Result version number	v1 (current)
This version publication date	05 July 2025
First version publication date	05 July 2025

Trial information

Trial identification

Sponsor protocol code	IMCOVAS

Additional study identifiers

ISRCTN number	-
ClinicalTrials.gov id (NCT number)	-
WHO universal trial number (UTN)	-

Notes:

Sponsors

Sponsor organisation name	University of Antwerp
Sponsor organisation address	Prinsstraat 13, Antwerp, Belgium, 2000
Public contact	Centre for the Evaluation of Vaccination, University of Antwerp, +32 032652565, cev@uantwerpen.be
Scientific contact	Centre for the Evaluation of Vaccination, University of Antwerp, +32 032652565, cev@uantwerpen.be

Notes:

Paediatric regulatory details

Is trial part of an agreed paediatric investigation plan (PIP)	No
Does article 45 of REGULATION (EC) No 1901/2006 apply to this trial?	No
Does article 46 of REGULATION (EC) No 1901/2006 apply to this trial?	No

Notes:

Results analysis stage

Analysis stage	Final
Date of interim/final analysis	08 July 2022
Is this the analysis of the primary completion data?	Yes
Primary completion date	08 July 2022
Global end of trial reached?	Yes
Global end of trial date	08 July 2022
Was the trial ended prematurely?	No

Notes:

General information about the trial

Main objective of the trial:

The main objective of the trial is to assess non-inferiority of the humoral immune response against SARS-Cov-2 infection of different vaccines and adapted vaccine schedules in comparison with the reference schedule, at 28 days post second study vaccine.

Protection of trial subjects:

The study is conducted in accordance with the required ethical principles, including the Declaration of Helsinki and Good Clinical Practice and compliant applicable laws and regulations, including the General Data Protection Regulation to protect confidentiality.

Subjects are protected to the risks associated to vaccination and blood draw by having procedures done by trained medical personnel and remaining under medical observation during at least 30 minutes after vaccination. Subjects with severe allergic reactions to vaccine components or anaphylaxis in the past are excluded to mitigate the risk of anaphylaxis. Diary cards are used to collect solicited and unsolicited adverse events after vaccination. Investigators will timely and accurate monitor the safety after vaccination and holding rules are defined in advance.

Background therapy: -

Evidence for comparator: -

Actual start date of recruitment	26 May 2021
Long term follow-up planned	No
Independent data monitoring committee (IDMC) involvement?	Yes

Notes:

Population of trial subjects

Subjects enrolled per country

Country: Number of subjects enrolled	Belgium: 566
Worldwide total number of subjects	566
EEA total number of subjects	566

Notes:

Subjects enrolled per age group

In utero	0
Preterm newborn - gestational age < 37 wk	0
Newborns (0-27 days)	0
Infants and toddlers (28 days-23 months)	0
Children (2-11 years)	0

Adolescents (12-17 years)	0
Adults (18-64 years)	566
From 65 to 84 years	0
85 years and over	0

Subject disposition

Recruitment

Recruitment details:

Volunteers were recruited in four study centres across Belgium. Participant recruitment started on 26th of May 2021. The final participant was included on 24th of June 2021.

Pre-assignment

Screening details:

A total of 580 participants were screened for inclusion into the trial. A total of 14 individuals were deemed ineligible to participate in the IMCOVAS trial. Of this group, 8 failed to meet the inclusion criteria while 7 met one of the exclusion criteria. Therefore a total of 566 participants were enrolled into the trial.

Period 1

Period 1 title	Overall trial (overall period)
Is this the baseline period?	Yes
Allocation method	Randomised - controlled
Blinding used	Single blind[1]
Roles blinded	Subject, Assessor

Blinding implementation details:

The trial is partially single blind. Subjects and study personnel, not involved in vaccine administration, are not informed about the brand and dose of the 1st & 2nd study vaccination, until 14 days after the 2nd vaccination, when the reporting period of adverse events is finished. For the intradermal administration and long-interval randomization groups, the subjects and personnel will know the brand of the vaccine, due the trial design nature.

Arms

Are arms mutually exclusive?	Yes
Arm title	Group 1A: Pfizer regular scheme

Arm description:

Subjects received a standard dose of BNT162b2 followed by a standard dose of BNT162b2 administered intramuscularly 28 days apart, as foreseen per the standard dosing scheme.

Arm type	Active comparator
Investigational medicinal product name	BNT162b2
Investigational medicinal product code	
Other name	Comirnaty
Pharmaceutical forms	Dispersion for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Subjects received one dose of 0.3mL BNT162b2 (30 micrograms of COVID-19 mRNA Vaccine) intramuscular on Day 0 and Day 28.

Arm title	Group 1B: Pfizer - Moderna scheme

Arm description:

Subjects received a standard dose BNT162b2 followed by a standard dose mRNA-1273 Vaccine administered intramuscularly 28 days apart.

Arm type	Experimental
Investigational medicinal product name	mRNA-1273
Investigational medicinal product code	
Other name	Spikevax
Pharmaceutical forms	Dispersion for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Subjects received one dose of 0.5mL mRNA-1273 (100 microgram mRNA) intramuscular on Day 28.

Investigational medicinal product name	BNT162b2
Investigational medicinal product code	
Other name	Comirnaty
Pharmaceutical forms	Dispersion for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Subjects received one dose of 0.3mL BNT162b2 (30 micrograms of COVID-19 mRNA Vaccine) intramuscular on Day 0.

Arm title	Group 1 C: Pfizer-AstraZeneca scheme

Arm description:

Subjects received a standerd dose of BNT162b2 followed by a standard dose of COVID-19 Vaccine (ChAdOx1-S [recombinant]) administered intramuscularly 28 days apart.

Arm type	Experimental
Investigational medicinal product name	BNT162b2
Investigational medicinal product code	
Other name	Comirnaty
Pharmaceutical forms	Dispersion for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Subjects received one dose of 0.3mL BNT162b2 (30 micrograms of COVID-19 mRNA Vaccine) intramuscular on Day 0.

Investigational medicinal product name	COVID-19 Vaccine (ChAdOx1-S [recombinant])
Investigational medicinal product code	
Other name	Vaxzevria
Pharmaceutical forms	Suspension for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Subjects received one dose of COVID-19 Vaccine (ChAdOx1-S [recombinant]) (0.5mL Vaxzevria, (not less than 2.5 × 108 infectious units (Inf.U) Chimpanzee Adenovirus encoding the SARS-CoV-2 Spike glycoprotein (ChAdOx1-S)) intramuscular on Day 28.

Arm title	Group 1D: Pfizer low dose scheme

Arm description:

Subjects received a low dose of BNT162b2 followed by a low dose of BNT162b2 administered intramuscularly 28 days apart.

Arm type	Experimental
Investigational medicinal product name	BNT162b2
Investigational medicinal product code	
Other name	Comirnaty
Pharmaceutical forms	Dispersion for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Subjects received one dose of 0.2 mL BNT162b2 (20 micrograms of COVID-19 mRNA Vaccine) intramuscular on Day 0 and Day 28.

Arm title	Group 1E: Pfizer long interval scheme

Arm description:

Subjects received a standard dose of BNT162b2 followed by a standard dose of BNT162b2 administered intramuscularly 12 weeks apart.

Arm type	Experimental
Investigational medicinal product name	BNT162b2
Investigational medicinal product code	
Other name	Comirnaty
Pharmaceutical forms	Dispersion for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Subjects received one dose of 0.3mL BNT162b2 (30 micrograms of COVID-19 mRNA Vaccine) intramuscular on Day 0 and Day 84.

Arm title	Group 1F: Pfizer intradermal scheme

Arm description:

Subjects received BNT162b2 followed by BNT162b2 administered intradermal 28 days apart.

Arm type	Experimental
Investigational medicinal product name	BNT162b2
Investigational medicinal product code	
Other name	Comirnaty
Pharmaceutical forms	Dispersion for injection
Routes of administration	Intradermal use

Dosage and administration details:

Subjects received one dose of 0.06 mL BNT162b2 (6 micrograms of COVID-19 mRNA Vaccine) intradermal on Day 0 and Day 28.

Arm title	Group 3A: Moderna regular scheme

Arm description:

Subjects received a standard dose of mRNA-1273, followed by a standard dose of mRNA-1273 Vaccine administered intramuscularly 28 days apart.

Arm type	Active comparator
Investigational medicinal product name	mRNA-1273
Investigational medicinal product code	
Other name	Spikevax
Pharmaceutical forms	Dispersion for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Subjects received one dose of 0.5mL mRNA-1273 (100 microgram mRNA) intramuscular on Day 0 and Day 28.

Arm title	Group 3B: Moderna low dose scheme

Arm description:

Subjects received a low dose of mRNA-1273, followed by a low dose of mRNA-1273 Vaccine administered intramuscularly 28 days apart.

Arm type	Experimental
Investigational medicinal product name	mRNA-1273
Investigational medicinal product code	
Other name	Spikevax
Pharmaceutical forms	Dispersion for injection
Routes of administration	Intramuscular use

Dosage and administration details:

Subjects received one dose of 0.25mL mRNA-1273 (50 microgram mRNA) intramuscular on Day 0 and Day 28.

Notes:

[1] - The number of roles blinded appears inconsistent with a single blinded trial. It is expected that there will be one role blinded in a single blind trial.
Justification: The trial is partially single blind. Subjects and study personnel, not involved in vaccine administration, are not informed about the brand and dose of the 1st & 2nd study vaccination, until 14 days after the 2nd vaccination, when the reporting period of adverse events is finished. For the intradermal administration and long-interval randomization groups, the subjects and personnel will know the brand of the vaccine, due the trial design nature.

Number of subjects in period 1	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer-AstraZeneca scheme
Started	67	77	63
Completed	65	73	61
Not completed	2	4	2
Consent withdrawn by subject	-	-	1
Physician decision	-	-	1
Went abroad	-	-	-
Lost to follow-up	2	4	-

Number of subjects in period 1	Group 1D: Pfizer low dose scheme	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme
Started	72	72	72
Completed	69	62	65
Not completed	3	10	7
Consent withdrawn by subject	2	6	3
Physician decision	-	-	-
Went abroad	-	1	-
Lost to follow-up	1	3	4

Number of subjects in period 1	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme
Started	70	73
Completed	65	71
Not completed	5	2
Consent withdrawn by subject	3	1
Physician decision	-	-
Went abroad	-	-
Lost to follow-up	2	1

Baseline characteristics

Reporting groups	
Reporting group title	Group 1A: Pfizer regular scheme
Reporting group description:	
Subjects received a standard dose of BNT162b2 followed by a standard dose of BNT162b2 administered intramuscularly 28 days apart, as foreseen per the standard dosing scheme.	
Reporting group title	Group 1B: Pfizer - Moderna scheme
Reporting group description:	
Subjects received a standard dose BNT162b2 followed by a standard dose mRNA-1273 Vaccine administered intramuscularly 28 days apart.	
Reporting group title	Group 1 C: Pfizer-AstraZeneca scheme
Reporting group description:	
Subjects received a standerd dose of BNT162b2 followed by a standard dose of COVID-19 Vaccine (ChAdOx1-S [recombinant]) administered intramuscularly 28 days apart.	
Reporting group title	Group 1D: Pfizer low dose scheme
Reporting group description:	
Subjects received a low dose of BNT162b2 followed by a low dose of BNT162b2 administered intramuscularly 28 days apart.	
Reporting group title	Group 1E: Pfizer long interval scheme
Reporting group description:	
Subjects received a standard dose of BNT162b2 followed by a standard dose of BNT162b2 administered intramuscularly 12 weeks apart.	
Reporting group title	Group 1F: Pfizer intradermal scheme
Reporting group description:	
Subjects received BNT162b2 followed by BNT162b2 administered intradermal 28 days apart.	
Reporting group title	Group 3A: Moderna regular scheme
Reporting group description:	
Subjects received a standard dose of mRNA-1273, followed by a standard dose of mRNA-1273 Vaccine administered intramuscularly 28 days apart.	
Reporting group title	Group 3B: Moderna low dose scheme
Reporting group description:	
Subjects received a low dose of mRNA-1273, followed by a low dose of mRNA-1273 Vaccine administered intramuscularly 28 days apart.	

Reporting group values	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer-AstraZeneca scheme
Number of subjects	67	77	63
Age categorical Units: Subjects			
In utero	0	0	0
Preterm newborn infants (gestational age < 37 wks)	0	0	0
Newborns (0-27 days)	0	0	0
Infants and toddlers (28 days-23 months)	0	0	0
Children (2-11 years)	0	0	0
Adolescents (12-17 years)	0	0	0
Adults (18-64 years)	67	77	63
From 65-84 years	0	0	0
85 years and over	0	0	0

Gender categorical Units: Subjects			
Female	31	37	37
Male	36	40	26

Reporting group values	Group 1D: Pfizer low dose scheme	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme
Number of subjects	72	72	72
Age categorical Units: Subjects			
In utero	0	0	0
Preterm newborn infants (gestational age < 37 wks)	0	0	0
Newborns (0-27 days)	0	0	0
Infants and toddlers (28 days-23 months)	0	0	0
Children (2-11 years)	0	0	0
Adolescents (12-17 years)	0	0	0
Adults (18-64 years)	72	72	72
From 65-84 years	0	0	0
85 years and over	0	0	0
Gender categorical Units: Subjects			
Female	33	35	36
Male	39	37	36

Reporting group values	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme	Total
Number of subjects	70	73	566
Age categorical Units: Subjects			
In utero	0	0	0
Preterm newborn infants (gestational age < 37 wks)	0	0	0
Newborns (0-27 days)	0	0	0
Infants and toddlers (28 days-23 months)	0	0	0
Children (2-11 years)	0	0	0
Adolescents (12-17 years)	0	0	0
Adults (18-64 years)	70	73	566
From 65-84 years	0	0	0
85 years and over	0	0	0
Gender categorical Units: Subjects			
Female	36	38	283
Male	34	35	283

End points

End points reporting groups

Reporting group title	Group 1A: Pfizer regular scheme
Reporting group description:	
Subjects received a standard dose of BNT162b2 followed by a standard dose of BNT162b2 administered intramuscularly 28 days apart, as foreseen per the standard dosing scheme.	
Reporting group title	Group 1B: Pfizer - Moderna scheme
Reporting group description:	
Subjects received a standard dose BNT162b2 followed by a standard dose mRNA-1273 Vaccine administered intramuscularly 28 days apart.	
Reporting group title	Group 1 C: Pfizer-AstraZeneca scheme
Reporting group description:	
Subjects received a standerd dose of BNT162b2 followed by a standard dose of COVID-19 Vaccine (ChAdOx1-S [recombinant]) administered intramuscularly 28 days apart.	
Reporting group title	Group 1D: Pfizer low dose scheme
Reporting group description:	
Subjects received a low dose of BNT162b2 followed by a low dose of BNT162b2 administered intramuscularly 28 days apart.	
Reporting group title	Group 1E: Pfizer long interval scheme
Reporting group description:	
Subjects received a standard dose of BNT162b2 followed by a standard dose of BNT162b2 administered intramuscularly 12 weeks apart.	
Reporting group title	Group 1F: Pfizer intradermal scheme
Reporting group description:	
Subjects received BNT162b2 followed by BNT162b2 administered intradermal 28 days apart.	
Reporting group title	Group 3A: Moderna regular scheme
Reporting group description:	
Subjects received a standard dose of mRNA-1273, followed by a standard dose of mRNA-1273 Vaccine administered intramuscularly 28 days apart.	
Reporting group title	Group 3B: Moderna low dose scheme
Reporting group description:	
Subjects received a low dose of mRNA-1273, followed by a low dose of mRNA-1273 Vaccine administered intramuscularly 28 days apart.	

Primary: Geometric mean titer of antibodies binding to the Receptor Binding Domain of SARS-CoV-2 S protein of the ancestral D614 SARS-CoV-2 virus strain 28days post second study vaccination

End point title	Geometric mean titer of antibodies binding to the Receptor Binding Domain of SARS-CoV-2 S protein of the ancestral D614 SARS-CoV-2 virus strain 28days post second study vaccination

End point description:

Primary endpoint analyses are performed on a modified Intention-To-Treat population (mITT). This mITT comprises of eligible participants who where still in the study at the primary endpoint visit, seronegative for COVID-19 at baseline, received both study vaccines, did not receive a vaccine outside the study 14 days after each study vaccination, did not receive a COVID-19 vaccine outside the study, and had not been identified with a COVID-19 infection before or on the primary endpoint evaluation visit.

Antibody responses at baseline and after vaccination were assessed using an enzyme-linked immunosorbent assay (ELISA) for the quantitative detection of IgG-class antibodies to Receptor Binding Domain (RBD). The GMT outcome measures is used to assess the non-inferiority of the humoral immune response against SARS-Cov-2 infection of different vaccines and adapted vaccine schedules in comparison with the reference schedule, after 2 vaccine doses.

End point type	Primary

End point timeframe:

28 days post second study vaccination

End point values	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer- AstraZeneca scheme	Group 1D: Pfizer low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	57	68	59	69
Units: Titers				
geometric mean (confidence interval 95%)	3325 (2765 to 3997)	4394 (3703 to 5213)	1352 (1101 to 1660)	2770 (2333 to 3290)

End point values	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	51	67	66	68
Units: Titers				
geometric mean (confidence interval 95%)	3006 (2481 to 3643)	2059 (1732 to 2448)	5094 (3791 to 6847)	4912 (3659 to 6595)

Statistical analyses

Statistical analysis title	GMT ratio for group 1b

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1B compared to reference schedule 1A in IgG levels 28 days post second vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1B: Pfizer - Moderna scheme
Number of subjects included in analysis	125
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0 [1]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	1.32
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.98

Notes:

[1] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority.

Statistical analysis title	GMT ratio for group 1c

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1C compared to reference schedule 1A in IgG levels 28 days post second vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1 C: Pfizer-AstraZeneca scheme
Number of subjects included in analysis	116
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 1 [2]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.41
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.29

Notes:

[2] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1d

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1D compared to reference schedule 1A in IgG levels 28 days post second vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1D: Pfizer low dose scheme
Number of subjects included in analysis	126
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.008 [3]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.83
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.62

Notes:

[3] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1e

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1E compared to reference schedule 1A in IgG levels 28 days post second vaccine.

Comparison groups	Group 1E: Pfizer long interval scheme v Group 1A: Pfizer regular scheme
Number of subjects included in analysis	108
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.002 [4]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.9

Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.66

Notes:

[4] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1f

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1F compared to reference schedule 1A in IgG levels 28 days post second vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1F: Pfizer intradermal scheme
Number of subjects included in analysis	124
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.564 [5]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.62
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.46

Notes:

[5] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority.

Statistical analysis title	GMT ratio for group 3b

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 3B compared to reference schedule 3A in IgG levels 28 days post second vaccine.

Comparison groups	Group 3A: Moderna regular scheme v Group 3B: Moderna low dose scheme
Number of subjects included in analysis	134
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0 [6]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.96
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.79

Notes:

[6] - For the Moderna comparison a p-value < 0.025 implies non-inferiority

Secondary: Numer of subjects with absenteeism (at least one day) from work after first vaccination

End point title	Numer of subjects with absenteeism (at least one day) from work after first vaccination

End point description:

To assess the impact of all different vaccination schedules on productivity, participants were asked to provide information regarding absenteeism from work within five days after the first study vaccination. Only participants in the mITT population who were employed at the time of completing the questionnaire are included.

End point type	Secondary

End point timeframe:

Absenteeism for at least one day within 5 days after first study vaccination.

End point values	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer- AstraZeneca scheme	Group 1D: Pfizer low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	42	52	51	46
Units: Number of participants	1	2	1	1

End point values	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	37	48	48	51
Units: Number of participants	2	0	6	1

Statistical analyses

No statistical analyses for this end point

Secondary: Numer of subjects with absenteeism from work (at least one day) after second vaccination

End point title	Numer of subjects with absenteeism from work (at least one day) after second vaccination

End point description:

To assess the impact of all different vaccination schedules on productivity, participants were asked to provide information regarding absenteeism from work within five days after the second study vaccination. Only participants in the mITT population who were employed at the time of completing the questionnaire are included.

End point type	Secondary

End point timeframe:

Absenteeism within 5 days after second study vaccination.

End point values	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer-AstraZeneca scheme	Group 1D: Pfizer low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	41	54	51	53
Units: Subjects	3	21	18	2

End point values	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	40	46	53	49
Units: Subjects	4	2	16	9

Statistical analyses

No statistical analyses for this end point

Secondary: Geometric mean titer of antibodies binding to the Receptor Binding Domain of SARS-CoV-2 S protein of the ancestral D614 SARS-CoV-2 virus strain 28 days post third study vaccination

End point title	Geometric mean titer of antibodies binding to the Receptor Binding Domain of SARS-CoV-2 S protein of the ancestral D614 SARS-CoV-2 virus strain 28 days post third study vaccination

End point description:

This non-inferiority analysis is performed on the mITT population, which includes participants who received three COVID-19 vaccines as per study protocol, did not experience a breakthrough infection, and did not receive a COVID-19 vaccine outside of the study (n=271). Therefore, this analysis investigates the pure vaccine effect 28 days after the third COVID-19 vaccine.

Antibody responses at baseline and after vaccination were assessed using an enzyme-linked immunosorbent assay (ELISA) for the quantitative detection of IgG-class antibodies to Receptor Binding Domain (RBD). The GMT outcome measures is used to assess the non-inferiority of the humoral immune response against SARS-Cov-2 infection of different vaccines and adapted vaccine schedules in comparison with the reference schedule, after 3 vaccine doses.

End point type	Secondary

End point timeframe:

28 days post third vaccination

End point values	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer-AstraZeneca scheme	Group 1D: Pfizer low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	30	31	34	35
Units: Titers				
geometric mean (confidence interval 95%)	3011 (2399 to 3780)	3433 (2758 to 4274)	3305 (2593 to 4213)	2990 (2419 to 3697)

End point values	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	29	35	35	42
Units: Titers				
geometric mean (confidence interval 95%)	2980 (2357 to 3768)	3350 (2707 to 4145)	4107 (3068 to 5499)	3392 (2546 to 4521)

Statistical analyses

Statistical analysis title	GMT ratio for group 1b

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1B compared to reference schedule 1A in IgG levels 28 days post third vaccine.

Comparison groups	Group 1B: Pfizer - Moderna scheme v Group 1A: Pfizer regular scheme
Number of subjects included in analysis	61
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.000048 [7]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	1.14
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.78

Notes:

[7] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority.

Statistical analysis title	GMT ratio for group 1c

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1C compared to reference schedule 1A in IgG levels 28 days post third vaccine.

Comparison groups	Group 1 C: Pfizer-AstraZeneca scheme v Group 1A: Pfizer regular scheme
Number of subjects included in analysis	64
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.000378 [8]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	1.1

Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.72

Notes:

[8] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1d

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1D compared to reference schedule 1A in IgG levels 28 days post third vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1D: Pfizer low dose scheme
Number of subjects included in analysis	65
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.000894 [9]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.99
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.68

Notes:

[9] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1e

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1E compared to reference schedule 1A in IgG levels 28 days post third vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1E: Pfizer long interval scheme
Number of subjects included in analysis	59
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.001486
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.99
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.67

Statistical analysis title	GMT ratio for group 1f

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1F compared to reference schedule 1A in IgG levels 28 days post third vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1F: Pfizer intradermal scheme
Number of subjects included in analysis	65
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.000053 [10]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	1.11
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.77

Notes:

[10] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 3b

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 3B compared to reference schedule 3A in IgG levels 28 days post third vaccine.

Comparison groups	Group 3A: Moderna regular scheme v Group 3B: Moderna low dose scheme
Number of subjects included in analysis	77
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.010742 [11]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.83
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.66

Notes:

[11] - For the Moderna comparison a p-value < 0.025 implies non-inferiority

Secondary: Geometric mean titer of neutralizing antibodies binding to Wuhan NT50 at 28 days after second study vaccination

End point title	Geometric mean titer of neutralizing antibodies binding to Wuhan NT50 at 28 days after second study vaccination

End point description:

Neutralizing antibody capacity against Wuhan was tested with a neutralisation assay on all available serum samples of the modified Intention-To-Treat population at 28 days after second study vaccination.

End point type	Secondary

End point timeframe:

28 days after second study vaccination

End point values	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer-AstraZeneca scheme	Group 1D: Pfizer low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	57	66	59	69
Units: Titers				
geometric mean (confidence interval 95%)	643 (521 to 794)	815 (666 to 997)	388 (305 to 492)	541 (443 to 661)

End point values	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	51	67	66	68
Units: Titers				
geometric mean (confidence interval 95%)	1451 (1168 to 1803)	432 (353 to 527)	958 (797 to 1152)	932 (776 to 1119)

Statistical analyses

Statistical analysis title	GMT ratio for group 1b

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1B compared to reference schedule 1A in nAB Wuhan NT50 at 28 days post second vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1B: Pfizer - Moderna scheme
Number of subjects included in analysis	123
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0 [12]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	1.27
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.95

Notes:

[12] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1c

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1C compared to reference schedule 1A in nAB Wuhan NT50 at 28 days post second vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1 C: Pfizer-AstraZeneca scheme

Number of subjects included in analysis	116
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.64204 [13]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.6
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.43

Notes:

[13] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority.

Statistical analysis title	GMT ratio for group 1d

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1D compared to reference schedule 1A in nAB Wuhan NT50 at 28 days post second vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1D: Pfizer low dose scheme
Number of subjects included in analysis	126
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.00455 [14]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.84
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.63

Notes:

[14] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1e

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1E compared to reference schedule 1A in nAB Wuhan NT50 at 28 days post second vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1E: Pfizer long interval scheme
Number of subjects included in analysis	108
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0 [15]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	2.26
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	1.66

Notes:

[15] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority.

Statistical analysis title	GMT ratio for group 1f
Statistical analysis description:	
Demonstrate non-inferiority of adapted schedule 1F compared to reference schedule 1A in nAB Wuhan NT50 at 28 days post second vaccine.	
Comparison groups	Group 1A: Pfizer regular scheme v Group 1F: Pfizer intradermal scheme
Number of subjects included in analysis	124
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.28896 [16]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.67
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.5

Notes:

[16] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority.

Statistical analysis title	GMT ratio for group 3b
Statistical analysis description:	
Demonstrate non-inferiority of adapted schedule 3B compared to reference schedule 3A in nAB Wuhan NT50 at 28 days post second vaccine.	
Comparison groups	Group 3A: Moderna regular scheme v Group 3B: Moderna low dose scheme
Number of subjects included in analysis	134
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0 [17]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.97
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.81

Notes:

[17] - For the Moderna comparison a p-value < 0.025 implies non-inferiority

Secondary: Geometric mean titer of neutralizing antibodies binding to Delta NT50 at 28 days after second study vaccination

End point title	Geometric mean titer of neutralizing antibodies binding to Delta NT50 at 28 days after second study vaccination

End point description:

Neutralizing antibody capacity against Delta was tested with a neutralisation assay on a subset of available serum samples of the modified Intention-To-Treat population at 28 days after second study vaccination.

End point type	Secondary

End point timeframe:

28 days after 2nd study vaccination

End point values	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer-AstraZeneca scheme	Group 1D: Pfizer low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	29	30	30	30
Units: Titer				
geometric mean (confidence interval 95%)	109 (88 to 135)	133 (108 to 164)	70 (54 to 90)	104 (84 to 128)

End point values	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	28	30	30	30
Units: Titer				
geometric mean (confidence interval 95%)	221 (178 to 275)	64 (52 to 79)	146 (118 to 181)	148 (119 to 184)

Statistical analyses

Statistical analysis title	GMT ratio for group 1b

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1B compared to reference schedule 1A in nAB Delta NT50 at 28 days post second vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1B: Pfizer - Moderna scheme
Number of subjects included in analysis	59
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.00001 [18]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	1.22
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.83

Notes:

[18] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1c

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1C compared to reference schedule 1A in nAB Delta NT50 at 28 days post second vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1 C: Pfizer-AstraZeneca scheme
Number of subjects included in analysis	59
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.45626 [19]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.64
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.42

Notes:

[19] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority.

Statistical analysis title	GMT ratio for group 1d

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1D compared to reference schedule 1A in nAB Delta NT50 at 28 days post second vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1D: Pfizer low dose scheme
Number of subjects included in analysis	59
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.00313 [20]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.96
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.65

Notes:

[20] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority.

Statistical analysis title	GMT ratio for group 1e

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1E compared to reference schedule 1A in nAB Delta NT50 at 28 days post second vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1E: Pfizer long interval scheme
Number of subjects included in analysis	57
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0 [21]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	2.03

Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	1.36

Notes:

[21] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority.

Statistical analysis title	GMT ratio for group 1f

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1F compared to reference schedule 1A in nAB Delta NT50 at 28 days post second vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1F: Pfizer intradermal scheme
Number of subjects included in analysis	59
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.67547 [22]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.59
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.4

Notes:

[22] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority.

Statistical analysis title	GMT ratio for group 3b

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 3B compared to reference schedule 3A in nAB Delta NT50 at 28 days post second vaccine.

Comparison groups	Group 3B: Moderna low dose scheme v Group 3A: Moderna regular scheme
Number of subjects included in analysis	60
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.00146 [23]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	1.01
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.75

Notes:

[23] - For the Moderna comparison a p-value < 0.025 implies non-inferiority

Secondary: Geometric mean titer of neutralizing antibodies binding to Wuhan NT50 at 28 days after third vaccination

End point title	Geometric mean titer of neutralizing antibodies binding to Wuhan NT50 at 28 days after third vaccination

End point description:

Neutralizing antibody capacity against Wuhan was tested with a neutralisation assay at 28 days after third vaccination. Only COVID-19 naïve participants from the humoral immunogenicity subset of the modified Intention-To-treat population are included in this analysis.

End point type	Secondary

End point timeframe:

28 days after third vaccination

End point values	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer- AstraZeneca scheme	Group 1D: Pfizer low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	17	19	16	15
Units: Titer				
geometric mean (confidence interval 95%)	1990 (1328 to 3190)	1730 (1163 to 2574)	2947 (1824 to 4763)	1948 (1266 to 2996)

End point values	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	15	16	19	22
Units: Titer				
geometric mean (confidence interval 95%)	1682 (1104 to 2563)	1907 (1274 to 2853)	2721 (1220 to 6067)	1640 (793 to 3394)

Statistical analyses

Statistical analysis title	GMT ratio for group 1b

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1B compared to reference schedule 1A in nAB Wuhan NT50 at 28 days post third vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1B: Pfizer - Moderna scheme
Number of subjects included in analysis	36
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.08971 [24]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.87
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.47

Notes:

[24] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1c
Statistical analysis description:	
Demonstrate non-inferiority of adapted schedule 1C compared to reference schedule 1A in nAB Wuhan NT50 at 28 days post third vaccine.	
Comparison groups	Group 1 C: Pfizer-AstraZeneca scheme v Group 1A: Pfizer regular scheme
Number of subjects included in analysis	33
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.00112 [25]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	1.48
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.73

Notes:

[25] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1d
Statistical analysis description:	
Demonstrate non-inferiority of adapted schedule 1D compared to reference schedule 1A in nAB Wuhan NT50 at 28 days post third vaccine.	
Comparison groups	Group 1D: Pfizer low dose scheme v Group 1A: Pfizer regular scheme
Number of subjects included in analysis	32
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.04197 [26]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.98
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.51

Notes:

[26] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1e
Statistical analysis description:	
Demonstrate non-inferiority of adapted schedule 1E compared to reference schedule 1A in nAB Wuhan NT50 at 28 days post third vaccine.	
Comparison groups	Group 1A: Pfizer regular scheme v Group 1E: Pfizer long interval scheme

Number of subjects included in analysis	32
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.12448 [27]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.85
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.44

Notes:

[27] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1f

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1F compared to reference schedule 1A in nAB Wuhan NT50 at 28 days post third vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1F: Pfizer intradermal scheme
Number of subjects included in analysis	33
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.04843 [28]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.96
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.5

Notes:

[28] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 3b

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 3B compared to reference schedule 3A in nAB Wuhan NT50 at 28 days post third vaccine.

Comparison groups	Group 3A: Moderna regular scheme v Group 3B: Moderna low dose scheme
Number of subjects included in analysis	41
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.57356 [29]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.6
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.37

Notes:

[29] - For the Moderna comparison a p-value < 0.025 implies non-inferiority

Secondary: Geometric mean titer of neutralizing antibodies binding to Delta NT50 at 28 days after third vaccination

End point title	Geometric mean titer of neutralizing antibodies binding to Delta NT50 at 28 days after third vaccination

End point description:

Neutralizing antibody capacity against Delta was tested with a neutralisation assay at 28 days after third vaccination. Only COVID-19 naïve participants from the humoral immunogenicity subset of the modified Intention-To-treat population are included in this analysis.

End point type	Secondary

End point timeframe:

28 days after third vaccination

End point values	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer- AstraZeneca scheme	Group 1D: Pfizer low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	17	19	16	15
Units: Titer				
geometric mean (confidence interval 95%)	571 (379 to 861)	432 (290 to 641)	859 (524 to 1408)	663 (428 to 1026)

End point values	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	15	16	19	22
Units: Titer				
geometric mean (confidence interval 95%)	504 (325 to 783)	587 (385 to 894)	556 (226 to 1369)	354 (155 to 809)

Statistical analyses

Statistical analysis title	GMT ratio for group 1b

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1B compared to reference schedule 1A in nAB Delta NT50 at 28 days post third vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1B: Pfizer - Moderna scheme

Number of subjects included in analysis	36
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.24595 [30]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.76
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.38

Notes:

[30] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1c

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1C compared to reference schedule 1A in nAB Delta NT50 at 28 days post third vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1 C: Pfizer-AstraZeneca scheme
Number of subjects included in analysis	33
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.00238 [31]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	1.5
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.68

Notes:

[31] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1d

Statistical analysis description:

Demonstrate non-inferiority of adapted schedule 1D compared to reference schedule 1A in nAB Delta NT50 at 28 days post third vaccine.

Comparison groups	Group 1A: Pfizer regular scheme v Group 1D: Pfizer low dose scheme
Number of subjects included in analysis	32
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.01548 [32]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	1.16
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.56

Notes:

[32] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1e
Statistical analysis description:	
Demonstrate non-inferiority of adapted schedule 1E compared to reference schedule 1A in nAB Delta NT50 at 28 days post third vaccine.	
Comparison groups	Group 1A: Pfizer regular scheme v Group 1E: Pfizer long interval scheme
Number of subjects included in analysis	32
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.11509 [33]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.88
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.42

Notes:

[33] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 1f
Statistical analysis description:	
Demonstrate non-inferiority of adapted schedule 1F compared to reference schedule 1A in nAB Delta NT50 at 28 days post third vaccine.	
Comparison groups	Group 1A: Pfizer regular scheme v Group 1F: Pfizer intradermal scheme
Number of subjects included in analysis	33
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.03962 [34]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	1.03
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.5

Notes:

[34] - For the Pfizer comparisons a p-value <0.005 implies non-inferiority

Statistical analysis title	GMT ratio for group 3b
Statistical analysis description:	
Demonstrate non-inferiority of adapted schedule 3B compared to reference schedule 3A in nAB Delta NT50 at 28 days post third vaccine.	
Comparison groups	Group 3A: Moderna regular scheme v Group 3B: Moderna low dose scheme

Number of subjects included in analysis	41
Analysis specification	Pre-specified
Analysis type	non-inferiority
P-value	= 0.48837 [35]
Method	Mixed models analysis
Parameter estimate	GMT ratio
Point estimate	0.64
Confidence interval	
level	Other: 97.5 %
sides	1-sided
lower limit	0.38

Notes:

[35] - For the Moderna comparison a p-value < 0.025 implies non-inferiority

Secondary: Number of participants with at least one solicited local adverse events

End point title	Number of participants with at least one solicited local adverse events

End point description:

The number of participants in the modified Intention-To-Treat population who reported at least one solicited local adverse event are reported. Following solicited local adverse events were surveyed among the participants through a diary: injection site erythema, injection site induration, injection site pain tenderness and injection site swelling.

End point type	Secondary

End point timeframe:

14 days after first and second vaccination

End point values	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer- AstraZeneca scheme	Group 1D: Pfizer low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	57	68	59	69
Units: Participants	56	68	59	68

End point values	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	52	67	66	68
Units: Participants	50	66	66	68

Statistical analyses

No statistical analyses for this end point

Secondary: Number of participants with at least one solicited systemic adverse events

End point title	Number of participants with at least one solicited systemic adverse events

End point description:

The number of participants in the modified Intention-To-Treat population who reported at least one solicited systemic adverse event are reported. Following solicited systemic adverse events were surveyed among the participants through a diary: arthralgia, chest pain, chills, dyspnoea, fatigue, headache, malaise, myalgia, nausea, neurological symptom, petechiae, pyrexia and vomiting.

End point type	Secondary

End point timeframe:

14 days after fisrt and second vaccination

End point values	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer-AstraZeneca scheme	Group 1D: Pfizer low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	57	68	59	69
Units: Number of participants	52	64	54	57

End point values	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	52	67	66	68
Units: Number of participants	33	55	64	58

Statistical analyses

No statistical analyses for this end point

Secondary: Number of participants with at least one unsolicited adverse events

End point title	Number of participants with at least one unsolicited adverse events

End point description:

The number of participants in the modified Intention-To-Treat population who reported at least one unsolicited adverse event are reported. Unsolicited adverse events were surveyed among the participants through a diary.

End point type	Secondary

End point timeframe:

14 days after first and second vaccination

End point values	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer- AstraZeneca scheme	Group 1D: Pfizer low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	57	68	59	69
Units: Number of participants	28	36	29	29

End point values	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	52	67	66	68
Units: Number of participants	26	48	36	40

Statistical analyses

No statistical analyses for this end point

Secondary: Number of participants with at least one severe adverse events

End point title	Number of participants with at least one severe adverse events

End point description:

End point type	Secondary

End point timeframe:

Throughout the entire study

End point values	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer- AstraZeneca scheme	Group 1D: Pfizer low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	67	77	63	72
Units: Number of participants	2	4	3	9

End point values	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	72	72	70	73
Units: Number of participants	2	0	1	5

Statistical analyses

No statistical analyses for this end point

Post-hoc: Number of participants in the modified intention to treat population, who completed the trial final visit and received a third COVID-19 vaccine, with a breakthrough infection after primary endpoint

End point title	Number of participants in the modified intention to treat population, who completed the trial final visit and received a third COVID-19 vaccine, with a breakthrough infection after primary endpoint

End point description:

End point type	Post-hoc

End point timeframe:

Between primary endpoint evaluation and final visit.

End point values	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer- AstraZeneca scheme	Group 1D: Pfizer low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	55	55	51	63
Units: Number of participants	36	45	31	50

End point values	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme
Subject group type	Reporting group	Reporting group	Reporting group	Reporting group
Number of subjects analysed	46	58	58	60
Units: Number of participants	39	39	48	42

Statistical analyses

No statistical analyses for this end point

Adverse events

Adverse events information

Timeframe for reporting adverse events:

Solicited AEs: from time of vaccination until 5 days post-study-vaccination for 1st and 2nd vaccination.
Unsolicited AEs: from time of vaccination until 14 days post-study-vaccination for 1st and 2nd vaccination.
SAE, AESI and MAAE: entire study period

Assessment type	Systematic

Dictionary used

Dictionary name	MedDRA
Dictionary version	24.0

Reporting groups

Reporting group title	Group 1A: Pfizer regular scheme

Reporting group description:

Subjects received a standard dose of BNT162b2 followed by a standard dose of BNT162b2 administered intramuscularly 28 days apart, as foreseen per the standard dosing scheme.

Reporting group title	Group 1B: Pfizer - Moderna scheme

Reporting group description:

Subjects received a standard dose BNT162b2 followed by a standard dose mRNA-1273 Vaccine administered intramuscularly 28 days apart.

Reporting group title	Group 1 C: Pfizer-AstraZeneca scheme

Reporting group description:

Subjects received a standerd dose of BNT162b2 followed by a standard dose of COVID-19 Vaccine (ChAdOx1-S [recombinant]) administered intramuscularly 28 days apart.

Reporting group title	Group 1D: Pfizer low dose scheme

Reporting group description:

Subjects received a low dose of BNT162b2 followed by a low dose of BNT162b2 administered intramuscularly 28 days apart.

Reporting group title	Group 1E: Pfizer long interval scheme

Reporting group description:

Subjects received a standard dose of BNT162b2 followed by a standard dose of BNT162b2 administered intramuscularly 12 weeks apart.

Reporting group title	Group 1F: Pfizer intradermal scheme

Reporting group description:

Subjects received BNT162b2 followed by BNT162b2 administered intradermal 28 days apart.

Reporting group title	Group 3A: Moderna regular scheme

Reporting group description:

Subjects received a standard dose of mRNA-1273, followed by a standard dose of mRNA-1273 Vaccine administered intramuscularly 28 days apart.

Reporting group title	Group 3B: Moderna low dose scheme

Reporting group description:

Subjects received a low dose of mRNA-1273, followed by a low dose of mRNA-1273 Vaccine administered intramuscularly 28 days apart.

Serious adverse events	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer-AstraZeneca scheme
Total subjects affected by serious adverse events			
subjects affected / exposed	2 / 67 (2.99%)	4 / 77 (5.19%)	3 / 63 (4.76%)
number of deaths (all causes)	0	0	0

number of deaths resulting from adverse events			
Injury, poisoning and procedural complications			
Wrist fracture			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	1 / 63 (1.59%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 1
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Clavicle fracture			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Spinal fracture			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Splenic rupture			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Cartilage injury			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	1 / 77 (1.30%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Meniscus injury			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	1 / 77 (1.30%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Scar			

alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 67 (1.49%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Surgical and medical procedures			
Gastric bypass			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	1 / 63 (1.59%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 1
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Nasal septal operation			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Intervertebral disc operation			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Mammoplasty			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	1 / 77 (1.30%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Nervous system disorders			
Carotid artery occlusion			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 67 (1.49%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Pregnancy, puerperium and perinatal conditions			
Abortion spontaneous			

alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	1 / 77 (1.30%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Gastrointestinal disorders			
Abdominal pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Appendicitis noninfective			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Hepatobiliary disorders			
Biliary colic			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Respiratory, thoracic and mediastinal disorders			
Pneumothorax spontaneous			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Renal and urinary disorders			
Nephrolithiasis			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Musculoskeletal and connective tissue			

disorders			
Rotator cuff syndrome			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Invertebral disc degeneration			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Infections and infestations			
Diverticulitis			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	1 / 63 (1.59%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 1
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Appendicitis			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Peritonsillar abscess			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Pyelonephritis			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Sepsis			
alternative assessment type: Non-systematic			

subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0

Serious adverse events	Group 1D: Pfizer low dose scheme	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme
Total subjects affected by serious adverse events			
subjects affected / exposed	6 / 72 (8.33%)	2 / 72 (2.78%)	0 / 72 (0.00%)
number of deaths (all causes)	0	0	0
number of deaths resulting from adverse events			
Injury, poisoning and procedural complications			
Wrist fracture			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Clavicle fracture			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Spinal fracture			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 72 (1.39%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Splenic rupture			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 72 (1.39%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Cartilage injury			
alternative assessment type: Non-systematic			

subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Meniscus injury			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Scar			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Surgical and medical procedures			
Gastric bypass			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Nasal septal operation			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	1 / 72 (1.39%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Intervertebral disc operation			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 72 (1.39%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Mammoplasty			
alternative assessment type: Non-systematic			

subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Nervous system disorders			
Carotid artery occlusion			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Pregnancy, puerperium and perinatal conditions			
Abortion spontaneous			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Gastrointestinal disorders			
Abdominal pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 72 (1.39%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Appendicitis noninfective			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Hepatobiliary disorders			
Biliary colic			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 72 (1.39%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Respiratory, thoracic and mediastinal disorders			

Pneumothorax spontaneous			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	1 / 72 (1.39%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 1	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Renal and urinary disorders			
Nephrolithiasis			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 72 (1.39%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Musculoskeletal and connective tissue disorders			
Rotator cuff syndrome			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 72 (1.39%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Invertebral disc degeneration			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Infections and infestations			
Diverticulitis			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Appendicitis			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Peritonsillar abscess			

alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 0	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Pyelonephritis			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 72 (1.39%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0
Sepsis			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 72 (1.39%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences causally related to treatment / all	0 / 1	0 / 0	0 / 0
deaths causally related to treatment / all	0 / 0	0 / 0	0 / 0

Serious adverse events	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme	
Total subjects affected by serious adverse events			
subjects affected / exposed	1 / 70 (1.43%)	5 / 73 (6.85%)	
number of deaths (all causes)	0	0	
number of deaths resulting from adverse events			
Injury, poisoning and procedural complications			
Wrist fracture			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Clavicle fracture			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	2 / 73 (2.74%)	
occurrences causally related to treatment / all	0 / 0	0 / 2	
deaths causally related to treatment / all	0 / 0	0 / 0	
Spinal fracture			
alternative assessment type: Non-systematic			

subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Splenic rupture			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Cartilage injury			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Meniscus injury			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Scar			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Surgical and medical procedures			
Gastric bypass			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Nasal septal operation			
alternative assessment type: Non-systematic			

subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Intervertebral disc operation			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Mammoplasty			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Nervous system disorders			
Carotid artery occlusion			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Pregnancy, puerperium and perinatal conditions			
Abortion spontaneous			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Gastrointestinal disorders			
Abdominal pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Appendicitis noninfective			
alternative assessment type: Non-systematic			

subjects affected / exposed	1 / 70 (1.43%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 1	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Hepatobiliary disorders			
Biliary colic			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Respiratory, thoracic and mediastinal disorders			
Pneumothorax spontaneous			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Renal and urinary disorders			
Nephrolithiasis			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Musculoskeletal and connective tissue disorders			
Rotator cuff syndrome			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Invertebral disc degeneration			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	1 / 73 (1.37%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Infections and infestations			

Diverticulitis			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Appendicitis			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	1 / 73 (1.37%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Peritonsillar abscess			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	1 / 73 (1.37%)	
occurrences causally related to treatment / all	0 / 0	0 / 1	
deaths causally related to treatment / all	0 / 0	0 / 0	
Pyelonephritis			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	
Sepsis			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences causally related to treatment / all	0 / 0	0 / 0	
deaths causally related to treatment / all	0 / 0	0 / 0	

Frequency threshold for reporting non-serious adverse events: 5 %

Non-serious adverse events	Group 1A: Pfizer regular scheme	Group 1B: Pfizer - Moderna scheme	Group 1 C: Pfizer-AstraZeneca scheme
Total subjects affected by non-serious adverse events			
subjects affected / exposed	67 / 67 (100.00%)	77 / 77 (100.00%)	63 / 63 (100.00%)
Nervous system disorders			

Dizziness			
alternative assessment type: Non-systematic			
subjects affected / exposed	2 / 67 (2.99%)	4 / 77 (5.19%)	2 / 63 (3.17%)
occurrences (all)	3	5	2
Headache			
subjects affected / exposed	45 / 67 (67.16%)	59 / 77 (76.62%)	48 / 63 (76.19%)
occurrences (all)	57	94	74
General disorders and administration site conditions			
Axillary pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences (all)	0	0	0
Chest pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 67 (1.49%)	3 / 77 (3.90%)	7 / 63 (11.11%)
occurrences (all)	1	4	7
Chills			
subjects affected / exposed	12 / 67 (17.91%)	34 / 77 (44.16%)	28 / 63 (44.44%)
occurrences (all)	12	35	29
Fatigue			
subjects affected / exposed	53 / 67 (79.10%)	66 / 77 (85.71%)	51 / 63 (80.95%)
occurrences (all)	76	96	75
Injection Site Bruising			
alternative assessment type: Non-systematic			
subjects affected / exposed	2 / 67 (2.99%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences (all)	2	0	0
Injection site discolouration			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences (all)	0	0	0
Injection site discomfort			
subjects affected / exposed	36 / 67 (53.73%)	42 / 77 (54.55%)	19 / 63 (30.16%)
occurrences (all)	66	68	31
Injection site erythema			

subjects affected / exposed	4 / 67 (5.97%)	10 / 77 (12.99%)	8 / 63 (12.70%)
occurrences (all)	5	12	8
Injection site haemorrhage			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	2 / 77 (2.60%)	0 / 63 (0.00%)
occurrences (all)	0	2	0
Injection site induration			
subjects affected / exposed	6 / 67 (8.96%)	21 / 77 (27.27%)	8 / 63 (12.70%)
occurrences (all)	9	28	9
Injection site movement impairment			
alternative assessment type: Non-systematic			
subjects affected / exposed	4 / 67 (5.97%)	4 / 77 (5.19%)	5 / 63 (7.94%)
occurrences (all)	5	6	5
Inejction site pain			
subjects affected / exposed	62 / 67 (92.54%)	75 / 77 (97.40%)	58 / 63 (92.06%)
occurrences (all)	109	126	99
Injection site pruritus			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 67 (1.49%)	2 / 77 (2.60%)	2 / 63 (3.17%)
occurrences (all)	1	3	2
Injection site swelling			
subjects affected / exposed	3 / 67 (4.48%)	11 / 77 (14.29%)	5 / 63 (7.94%)
occurrences (all)	3	12	5
Injection site warmth			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	6 / 77 (7.79%)	2 / 63 (3.17%)
occurrences (all)	0	7	2
Malaise			
subjects affected / exposed	21 / 67 (31.34%)	48 / 77 (62.34%)	39 / 63 (61.90%)
occurrences (all)	24	50	42
Pyrexia			
subjects affected / exposed	5 / 67 (7.46%)	27 / 77 (35.06%)	18 / 63 (28.57%)
occurrences (all)	5	28	24
Gastrointestinal disorders			

Abdominal pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	3 / 67 (4.48%)	9 / 77 (11.69%)	5 / 63 (7.94%)
occurrences (all)	3	9	5
Diarrhoea			
alternative assessment type: Non-systematic			
subjects affected / exposed	3 / 67 (4.48%)	3 / 77 (3.90%)	3 / 63 (4.76%)
occurrences (all)	3	3	3
Nausea			
subjects affected / exposed	10 / 67 (14.93%)	24 / 77 (31.17%)	20 / 63 (31.75%)
occurrences (all)	12	27	22
Vomiting			
subjects affected / exposed	1 / 67 (1.49%)	4 / 77 (5.19%)	4 / 63 (6.35%)
occurrences (all)	1	4	4
Respiratory, thoracic and mediastinal disorders			
Cough			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 67 (1.49%)	3 / 77 (3.90%)	5 / 63 (7.94%)
occurrences (all)	1	4	5
Dyspnoea			
subjects affected / exposed	4 / 67 (5.97%)	7 / 77 (9.09%)	6 / 63 (9.52%)
occurrences (all)	4	7	6
Oropharyngeal pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	2 / 67 (2.99%)	4 / 77 (5.19%)	3 / 63 (4.76%)
occurrences (all)	2	4	3
Skin and subcutaneous tissue disorders			
Eczema			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	1 / 77 (1.30%)	0 / 63 (0.00%)
occurrences (all)	0	1	0
Pruritus			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	1 / 77 (1.30%)	0 / 63 (0.00%)
occurrences (all)	0	1	0

Skin hyperpigmentation			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	0 / 77 (0.00%)	0 / 63 (0.00%)
occurrences (all)	0	0	0
Musculoskeletal and connective tissue disorders			
Arthralgia			
subjects affected / exposed	13 / 67 (19.40%)	27 / 77 (35.06%)	24 / 63 (38.10%)
occurrences (all)	14	28	27
Back pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 67 (0.00%)	1 / 77 (1.30%)	6 / 63 (9.52%)
occurrences (all)	0	1	6
Myalgia			
subjects affected / exposed	27 / 67 (40.30%)	46 / 77 (59.74%)	27 / 63 (42.86%)
occurrences (all)	31	52	31
Infections and infestations			
COVID-19			
alternative assessment type: Non-systematic			
subjects affected / exposed	26 / 67 (38.81%)	35 / 77 (45.45%)	26 / 63 (41.27%)
occurrences (all)	27	37	26
Nasopharyngitis			
alternative assessment type: Non-systematic			
subjects affected / exposed	5 / 67 (7.46%)	9 / 77 (11.69%)	4 / 63 (6.35%)
occurrences (all)	5	10	4
Pharyngitis			
alternative assessment type: Non-systematic			
subjects affected / exposed	2 / 67 (2.99%)	3 / 77 (3.90%)	1 / 63 (1.59%)
occurrences (all)	2	4	1

Non-serious adverse events	Group 1D: Pfizer low dose scheme	Group 1E: Pfizer long interval scheme	Group 1F: Pfizer intradermal scheme
Total subjects affected by non-serious adverse events			
subjects affected / exposed	72 / 72 (100.00%)	69 / 72 (95.83%)	72 / 72 (100.00%)
Nervous system disorders			
Dizziness			
alternative assessment type: Non-systematic			

subjects affected / exposed	3 / 72 (4.17%)	2 / 72 (2.78%)	0 / 72 (0.00%)
occurrences (all)	3	2	0
Headache			
subjects affected / exposed	37 / 72 (51.39%)	28 / 72 (38.89%)	40 / 72 (55.56%)
occurrences (all)	50	42	53
General disorders and administration site conditions			
Axillary pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	1 / 72 (1.39%)	0 / 72 (0.00%)
occurrences (all)	0	1	0
Chest pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	5 / 72 (6.94%)	2 / 72 (2.78%)	2 / 72 (2.78%)
occurrences (all)	6	3	2
Chills			
subjects affected / exposed	10 / 72 (13.89%)	3 / 72 (4.17%)	4 / 72 (5.56%)
occurrences (all)	10	4	4
Fatigue			
subjects affected / exposed	54 / 72 (75.00%)	35 / 72 (48.61%)	48 / 72 (66.67%)
occurrences (all)	75	51	67
Injection Site Bruising			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	6 / 72 (8.33%)
occurrences (all)	0	0	7
Injection site discolouration			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	4 / 72 (5.56%)
occurrences (all)	0	0	6
Injection site discomfort			
subjects affected / exposed	37 / 72 (51.39%)	37 / 72 (51.39%)	45 / 72 (62.50%)
occurrences (all)	59	63	77
Injection site erythema			
subjects affected / exposed	3 / 72 (4.17%)	6 / 72 (8.33%)	69 / 72 (95.83%)
occurrences (all)	3	6	140
Injection site haemorrhage			

alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	1 / 72 (1.39%)	4 / 72 (5.56%)
occurrences (all)	0	1	5
Injection site induration			
subjects affected / exposed	5 / 72 (6.94%)	9 / 72 (12.50%)	27 / 72 (37.50%)
occurrences (all)	9	12	40
Injection site movement impairment			
alternative assessment type: Non-systematic			
subjects affected / exposed	5 / 72 (6.94%)	2 / 72 (2.78%)	0 / 72 (0.00%)
occurrences (all)	7	3	0
Inejction site pain			
subjects affected / exposed	59 / 72 (81.94%)	51 / 72 (70.83%)	49 / 72 (68.06%)
occurrences (all)	104	88	71
Injection site pruritus			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 72 (1.39%)	1 / 72 (1.39%)	26 / 72 (36.11%)
occurrences (all)	1	1	33
Injection site swelling			
subjects affected / exposed	2 / 72 (2.78%)	4 / 72 (5.56%)	47 / 72 (65.28%)
occurrences (all)	3	5	74
Injection site warmth			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 72 (1.39%)	1 / 72 (1.39%)	4 / 72 (5.56%)
occurrences (all)	1	1	5
Malaise			
subjects affected / exposed	22 / 72 (30.56%)	9 / 72 (12.50%)	13 / 72 (18.06%)
occurrences (all)	25	10	15
Pyrexia			
subjects affected / exposed	5 / 72 (6.94%)	2 / 72 (2.78%)	1 / 72 (1.39%)
occurrences (all)	5	2	1
Gastrointestinal disorders			
Abdominal pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	6 / 72 (8.33%)	2 / 72 (2.78%)	2 / 72 (2.78%)
occurrences (all)	6	2	2

Diarrhoea			
alternative assessment type: Non-systematic			
subjects affected / exposed	5 / 72 (6.94%)	1 / 72 (1.39%)	4 / 72 (5.56%)
occurrences (all)	5	1	8
Nausea			
subjects affected / exposed	9 / 72 (12.50%)	12 / 72 (16.67%)	9 / 72 (12.50%)
occurrences (all)	11	13	11
Vomiting			
subjects affected / exposed	1 / 72 (1.39%)	2 / 72 (2.78%)	2 / 72 (2.78%)
occurrences (all)	1	2	2
Respiratory, thoracic and mediastinal disorders			
Cough			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 72 (1.39%)	4 / 72 (5.56%)	1 / 72 (1.39%)
occurrences (all)	1	4	1
Dyspnoea			
subjects affected / exposed	2 / 72 (2.78%)	1 / 72 (1.39%)	1 / 72 (1.39%)
occurrences (all)	2	2	1
Oropharyngeal pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	2 / 72 (2.78%)	2 / 72 (2.78%)	5 / 72 (6.94%)
occurrences (all)	3	2	5
Skin and subcutaneous tissue disorders			
Eczema			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	0 / 72 (0.00%)
occurrences (all)	0	0	0
Pruritus			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	4 / 72 (5.56%)
occurrences (all)	0	0	4
Skin hyperpigmentation			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	4 / 72 (5.56%)
occurrences (all)	0	0	4

Musculoskeletal and connective tissue disorders			
Arthralgia			
subjects affected / exposed	15 / 72 (20.83%)	10 / 72 (13.89%)	6 / 72 (8.33%)
occurrences (all)	17	12	7
Back pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	3 / 72 (4.17%)	1 / 72 (1.39%)	4 / 72 (5.56%)
occurrences (all)	3	1	5
Myalgia			
subjects affected / exposed	22 / 72 (30.56%)	13 / 72 (18.06%)	14 / 72 (19.44%)
occurrences (all)	25	15	16
Infections and infestations			
COVID-19			
alternative assessment type: Non-systematic			
subjects affected / exposed	39 / 72 (54.17%)	31 / 72 (43.06%)	32 / 72 (44.44%)
occurrences (all)	39	31	32
Nasopharyngitis			
alternative assessment type: Non-systematic			
subjects affected / exposed	6 / 72 (8.33%)	4 / 72 (5.56%)	5 / 72 (6.94%)
occurrences (all)	7	4	5
Pharyngitis			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 72 (0.00%)	0 / 72 (0.00%)	3 / 72 (4.17%)
occurrences (all)	0	0	3

Non-serious adverse events	Group 3A: Moderna regular scheme	Group 3B: Moderna low dose scheme	
Total subjects affected by non-serious adverse events			
subjects affected / exposed	69 / 70 (98.57%)	73 / 73 (100.00%)	
Nervous system disorders			
Dizziness			
alternative assessment type: Non-systematic			
subjects affected / exposed	2 / 70 (2.86%)	4 / 73 (5.48%)	
occurrences (all)	2	5	
Headache			
subjects affected / exposed	44 / 70 (62.86%)	46 / 73 (63.01%)	
occurrences (all)	70	73	

General disorders and administration site conditions			
Axillary pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	2 / 70 (2.86%)	4 / 73 (5.48%)	
occurrences (all)	2	4	
Chest pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	6 / 70 (8.57%)	5 / 73 (6.85%)	
occurrences (all)	6	9	
Chills			
subjects affected / exposed	34 / 70 (48.57%)	26 / 73 (35.62%)	
occurrences (all)	36	26	
Fatigue			
subjects affected / exposed	51 / 70 (72.86%)	53 / 73 (72.60%)	
occurrences (all)	89	85	
Injection Site Bruising			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 70 (1.43%)	0 / 73 (0.00%)	
occurrences (all)	1	0	
Injection site discolouration			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences (all)	0	0	
Injection site discomfort			
subjects affected / exposed	28 / 70 (40.00%)	35 / 73 (47.95%)	
occurrences (all)	47	52	
Injection site erythema			
subjects affected / exposed	21 / 70 (30.00%)	17 / 73 (23.29%)	
occurrences (all)	34	18	
Injection site haemorrhage			
alternative assessment type: Non-systematic			
subjects affected / exposed	3 / 70 (4.29%)	3 / 73 (4.11%)	
occurrences (all)	4	3	
Injection site induration			

subjects affected / exposed	22 / 70 (31.43%)	19 / 73 (26.03%)	
occurrences (all)	30	23	
Injection site movement impairment			
alternative assessment type: Non-systematic			
subjects affected / exposed	5 / 70 (7.14%)	6 / 73 (8.22%)	
occurrences (all)	5	6	
Inejction site pain			
subjects affected / exposed	67 / 70 (95.71%)	71 / 73 (97.26%)	
occurrences (all)	133	120	
Injection site pruritus			
alternative assessment type: Non-systematic			
subjects affected / exposed	6 / 70 (8.57%)	5 / 73 (6.85%)	
occurrences (all)	6	6	
Injection site swelling			
subjects affected / exposed	15 / 70 (21.43%)	13 / 73 (17.81%)	
occurrences (all)	18	16	
Injection site warmth			
alternative assessment type: Non-systematic			
subjects affected / exposed	4 / 70 (5.71%)	2 / 73 (2.74%)	
occurrences (all)	6	2	
Malaise			
subjects affected / exposed	36 / 70 (51.43%)	38 / 73 (52.05%)	
occurrences (all)	39	40	
Pyrexia			
subjects affected / exposed	22 / 70 (31.43%)	9 / 73 (12.33%)	
occurrences (all)	22	9	
Gastrointestinal disorders			
Abdominal pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	3 / 70 (4.29%)	6 / 73 (8.22%)	
occurrences (all)	3	7	
Diarrhoea			
alternative assessment type: Non-systematic			
subjects affected / exposed	3 / 70 (4.29%)	3 / 73 (4.11%)	
occurrences (all)	3	3	

Nausea			
subjects affected / exposed	24 / 70 (34.29%)	24 / 73 (32.88%)	
occurrences (all)	27	27	
Vomiting			
subjects affected / exposed	4 / 70 (5.71%)	1 / 73 (1.37%)	
occurrences (all)	4	1	
Respiratory, thoracic and mediastinal disorders			
Cough			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	3 / 73 (4.11%)	
occurrences (all)	0	3	
Dyspnoea			
subjects affected / exposed	3 / 70 (4.29%)	6 / 73 (8.22%)	
occurrences (all)	3	7	
Oropharyngeal pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	3 / 70 (4.29%)	3 / 73 (4.11%)	
occurrences (all)	4	3	
Skin and subcutaneous tissue disorders			
Eczema			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	3 / 73 (4.11%)	
occurrences (all)	0	4	
Pruritus			
alternative assessment type: Non-systematic			
subjects affected / exposed	1 / 70 (1.43%)	0 / 73 (0.00%)	
occurrences (all)	1	0	
Skin hyperpigmentation			
alternative assessment type: Non-systematic			
subjects affected / exposed	0 / 70 (0.00%)	0 / 73 (0.00%)	
occurrences (all)	0	0	
Musculoskeletal and connective tissue disorders			
Arthralgia			
subjects affected / exposed	22 / 70 (31.43%)	17 / 73 (23.29%)	
occurrences (all)	25	20	

Back pain			
alternative assessment type: Non-systematic			
subjects affected / exposed	2 / 70 (2.86%)	0 / 73 (0.00%)	
occurrences (all)	2	0	
Myalgia			
subjects affected / exposed	36 / 70 (51.43%)	31 / 73 (42.47%)	
occurrences (all)	46	35	
Infections and infestations			
COVID-19			
alternative assessment type: Non-systematic			
subjects affected / exposed	40 / 70 (57.14%)	40 / 73 (54.79%)	
occurrences (all)	40	41	
Nasopharyngitis			
alternative assessment type: Non-systematic			
subjects affected / exposed	7 / 70 (10.00%)	3 / 73 (4.11%)	
occurrences (all)	7	3	
Pharyngitis			
alternative assessment type: Non-systematic			
subjects affected / exposed	2 / 70 (2.86%)	0 / 73 (0.00%)	
occurrences (all)	3	0	

More information

Substantial protocol amendments (globally)

Were there any global substantial amendments to the protocol? Yes

Date	Amendment
10 June 2021	Removal of groups 2a, 2b, 2c and 2d, due to the accelerated national vaccinatino campaign and age limitations for these study groups. No participants were recruited at that time in those study groups. Removal of age and gender stratification.
23 December 2021	Allow the participants to receive a COVID-19 vaccine outside of the trial, during the national vaccination campaign for a third COVID-19 vaccine dose. Addition of an ad hoc post 3rd COVID-19 vaccine dose visit.

Notes:

Interruptions (globally)

Were there any global interruptions to the trial? No

Limitations and caveats

None reported

Online references

http://www.ncbi.nlm.nih.gov/pubmed/39019657