

Supplementary Table 1. The median (interquartile range) value of IFN- γ concentration (IU/mL) from the Covi-FERON ELISA assay using stimulation of the original spike (OS).

Vaccine group ^a	N	Median (interquartile range) (IU/mL)
Unvaccinated	108	0.02 (0.00-0.11)
AZ 1 st	28	2.57 (0.78-3.81)
AZ 2 nd	48	0.39 (0.11-0.95)
AZ booster	20	1.10 (0.41-3.18)
AZ/PF 1 st	30	0.20 (0.07-0.39)
AZ/PF 2 nd	30	0.77 (0.61-1.95)
PF 1 st	30	0.66 (0.26-1.28)
PF 2 nd	52	0.77 (0.34-3.46)
PF booster	18	2.59 (1.33-6.38)
MO 1 st	32	0.33 (0.14-0.75)
MO 2 nd	31	1.48 (1.00-3.19)
JAN 1st	33	0.37 (0.14-0.76)

^a AZ (ChAdOx1-S); PF (BNT162b2); MO (mRNA-1273); JAN (Ad26.COV2.S).

Abbreviations: OS, original spike; IFN- γ , interferon-gamma.

Supplementary Table 2. The median (interquartile range) value of IFN- γ concentration (IU/mL) from the Covi-FERON ELISA assay using stimulation of the variant spike (VS).

Vaccine group ^a	N	Median (interquartile range) (IU/mL)
Unvaccinated	108	0.02 (0.00-0.09)
AZ 1 st	28	0.95 (0.31-1.47)
AZ 2 nd	48	0.23 (0.10-0.58)
AZ booster	20	0.82 (0.26-1.82)
AZ/PF 1 st	30	0.15 (0.02-0.27)
AZ/PF 2 nd	30	0.57 (0.16-1.07)
PF 1 st	30	0.25 (0.08-0.84)
PF 2 nd	52	0.36 (0.12-1.42)
PF booster	18	0.81 (0.39-4.04)
MO 1 st	32	0.20 (0.11-0.41)
MO 2 nd	31	0.89 (0.59-2.10)
JAN 1st	33	0.15 (0.06-0.33)

^a AZ (ChAdOx1-S); PF (BNT162b2); MO (mRNA-1273); JAN (Ad26.COV2.S).

Abbreviations: VS, variant spike; IFN- γ , interferon-gamma.

Supplementary Table 3. The median (interquartile range) value of the number of spots per 250,000 PBMCs from the T-SPOT assay.

Vaccine group ^a	N	Median (interquartile range) (SFC/250,000 PBMCs)
Unvaccinated	108	0.0 (0.0-0.0)
AZ 1 st	28	23.5 (10.5-34.0)
AZ 2 nd	48	7.5 (2.0-19.5)
AZ booster	20	31.5 (14.0-54.0)
AZ/PF 1 st	30	0.0 (0.0-0.0)
AZ/PF 2 nd	30	26.0 (10.0-36.0)
PF 1 st	30	13.0 (7.0-28.0)
PF 2 nd	52	17.5 (5.0-27.5)
PF booster	18	39.0 (24.0-46.0)
MO 1 st	32	8.5 (2.0-17.0)
MO 2 nd	31	28.0 (20.0-44.0)
JAN 1st	33	10.0 (7.0-17.0)

^a AZ (ChAdOx1-S); PF (BNT162b2); MO (mRNA-1273); JAN (Ad26.COVS.2.S).

Abbreviations: SFC, spots-forming cells; PBMC, peripheral blood mononuclear cells.

Supplementary Table 4. The median (interquartile range) value of percent of inhibition (%)

Vaccine group ^{a,b}	N	Median (interquartile range) (%)
Unvaccinated	108	7.75 (3.95-12.35)
AZ 1 st	28	34.10 (21.66-53.97)
AZ 2 nd	48	71.03 (32.28-91.85)
AZ booster	20	98.87 (98.62-98.97)
AZ/PF 1 st	30	27.46 (18.49-48.30)
AZ/PF 2 nd	30	98.73 (97.66-99.22)
PF 1 st	30	53.87 (36.81-65.12)
PF 2 nd	52	94.83 (88.10-91.17)
PF booster	18	99.02 (98.92-99.11)
MO 1 st	32	89.16 (81.36-91.61)
MO 2 nd	31	98.96 (98.11-99.22)
JAN 1 st	33	37.32 (29.84-54.52)

^a AZ (ChAdOx1-S); PF (BNT162b2); MO (mRNA-1273); JAN (Ad26.COV2.S).

^b The serum samples were diluted to a ratio of 1:20 to compare the B cell response after vaccine administration.