

## Supplementary Material

### ***Improved neutralization of the SARS-CoV-2 Omicron variant after Pfizer-BioNTech BNT162b2 COVID-19 vaccine boosting***

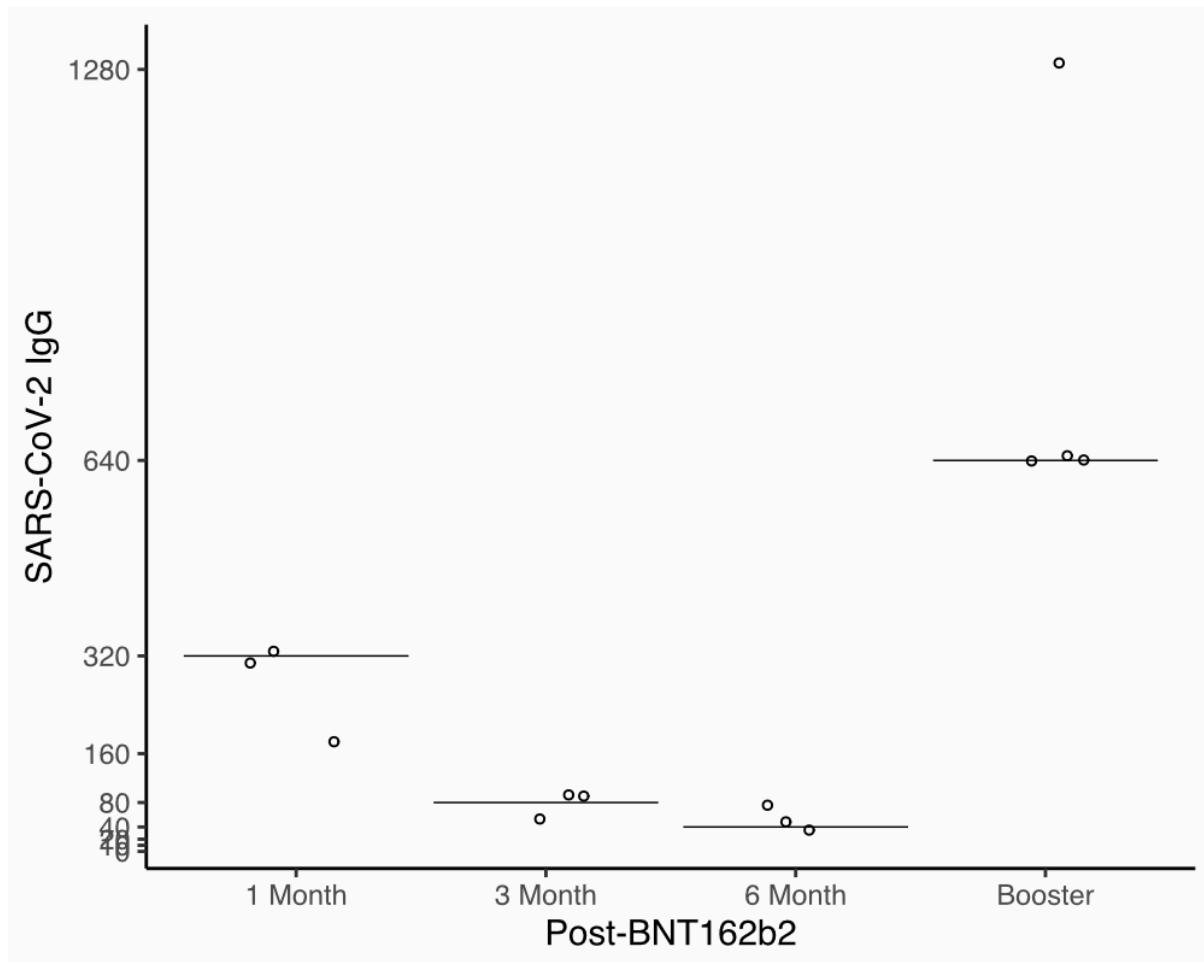
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**Table S1: Study Participant Demographic and In-house SARS-CoV-2 Immunofluorescence (IFA) and Neutralizing Antibody Titers (nAbT)**

Sera	Sex	Age (yrs)	Timing post BNT162b2 (months)	SARS-CoV-2 IFA			Virus Lineage		
				IgG	IgA	IgM	Wildtype	Delta	Omicron
5	M	65	1	320	<10	<10	40	20	<10
3	M	49	1	320	<10	<10	20	<10	<10
3	M	49	3	40	<10	<10	<10	<10	<10
9	F	59	1	160	<10	<10	20	<10	<10
9	F	59	3	80	<10	<10	<10	<10	<10
9	F	59	Booster(1M)	1280	<10	<10	320	320	<10
1	F	36	Naive	<10	<10	<10	<10	<10	<10
1	F	36	3	80	<10	<10	40	20	<10
14	F	34	6	80	<10	<10	20	<10	<10
14	F	34	Booster (1M)	640	<10	<10	160	160	40
15	M	63	6	40	<10	<10	<10	<10	<10
15	M	63	Booster (1M)	640	20	<10	160	80	80
16	M	59	6	40	<10	<10	20	<10	<10
16	M	59	Booster (1M)	160	20	<10	320	160	40

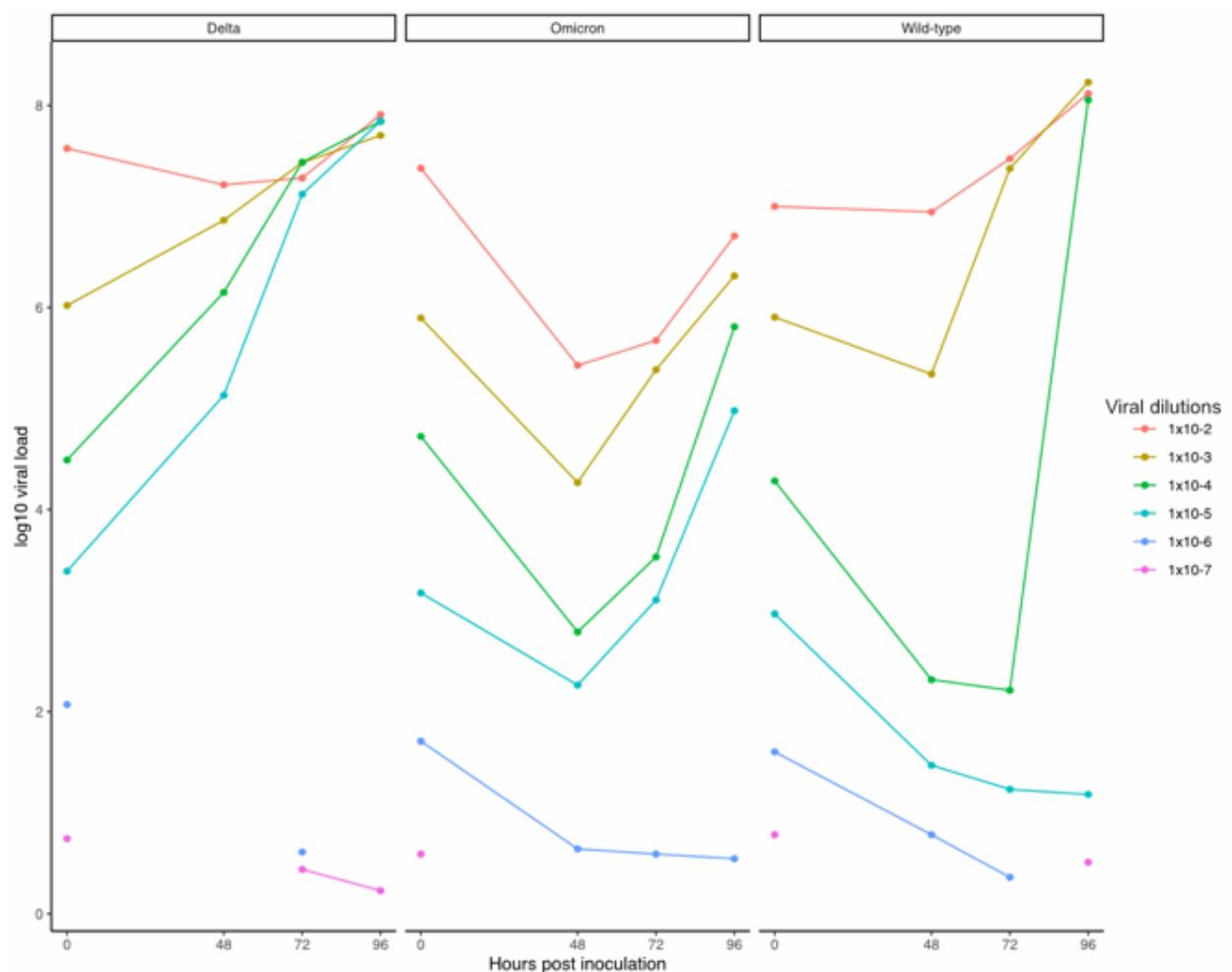
**Key:** BNT162b2 – Pfizer-BioNTech (BNT162b2) vaccination; F – female; M – male; IFA – Immunofluorescence Assay; IgA – immunoglobulin A; IgG – immunoglobulin G; IgM – immunoglobulin M; Omicron – Omicron (B.1.1.529) lineage; Wild-type – Wildtype (A.2.2) lineage; Delta – Delta (B.1.617.2) lineage; Booster (1M) – 4 weeks after 3 booster dose of BNT162b2.

**Figure S1.** Waning levels of SARS-CoV-2-specific IgG 1, 3 and 6 months following two doses of third dose of BNT162b2 which are boosted 4 weeks after the 3 BNT162b2 dose



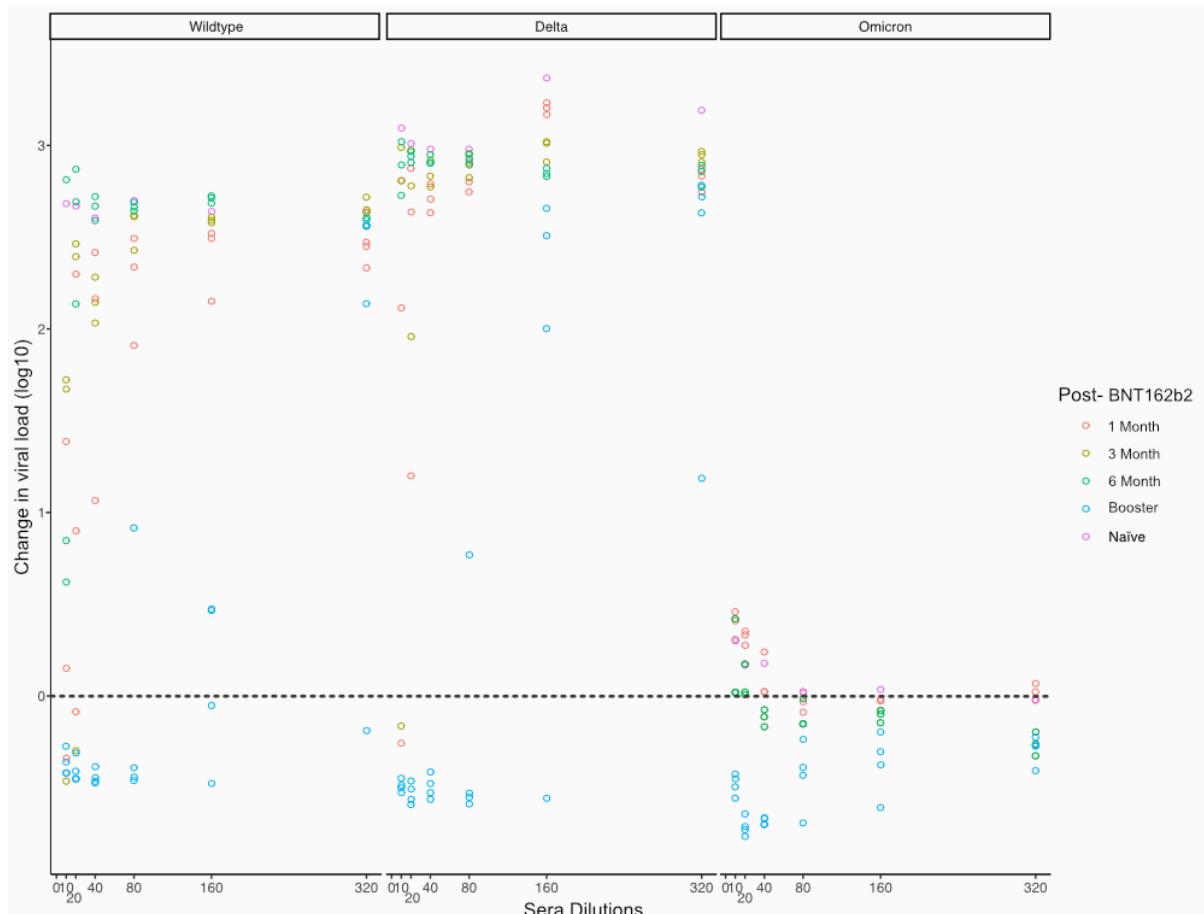
**Figure S3.** Illustrates levels of SARS-CoV-2-specific IgG 1, 3 and 6 months following two doses of third dose of BNT162b2 and 4 weeks after the 3rd boosting dose of BNT162b2 dose. Levels have been determined using an immunofluorescence assay, black lines depict the median IgG level for each timepoint.

**Figure S2. Infection kinetics of SARS-CoV-2 lineages propagated in VeroE6/TMPRSS2 cells**



**Figure S2.** Illustrates infection kinetics of SARS-CoV-2 variants propagated in VeroE6/TMPRSS2 cells. Circles represent the viral load of serial dilutions of virus quantified at inoculation, 48-, 72- and 96-hours post-infection.

**Figure S3. Change in SARS-CoV-2 viral load 72 hours post-neutralisation with sera collected post-BNT152b2 challenged with SARS-CoV-2 VOCs Delta and Omicron compared to wildtype (lineage A.2.2) virus**



**Figure S3.** Illustrates replication of SARS-CoV-2 variants post-neutralisation when neutralised sera collected at different intervals post- BNT152b2. Dashed line indicates positive replication compared to the viral load determined for the viral inoculum. Coloured circles represent sera collected 1 Month (red), 3 Months (yellow), 6 Months (green), 4 weeks after a booster dose (blue) and vaccine naïve sera (pink).

**Table S2: Non-Silent mutations in SARS-CoV-2 isolates used in Micro-neutralization experiments.**

SARS-CoV-2 Virus	Non-silent Mutations	Pango Lineage
Omicron	NSP3:K38R, NSP3:S1265(del), NSP3:A1892T, NSP4:T492I, NSP5:P132H, NSP6:L105(del), NSP6:I189V, NSP12b:P314L, NSP14:I42V, S:A67 (del), S:I68 (del), S:T95I, S:G142 (del), S:I210 (ins), S:N211(del), S:G339D, S:S371L, S:S373P, S:S375F, S:K417N, S:N440K, S:G446S, S:S477N, S:T478K, S:E484A, S:Q493R, S:G496S, S:Q498R, S:N501Y, S:Y505H, S:T547K, S:D614G, S:H655Y, S:N679K, S:P681H, S:N764K, S:D796Y*, S:N856K*, S:Q954H, S:N969K, S:L981F, E:T9I, M:D3G, M:Q19E, M:A63T, N:P13L*, N:E31(del)*, N:A134V*, N:RG203KR, ORF10:R24C	B.1.1.529
Delta	NSP3:H323Y, NSP3:A488S, NSP3:P1228L, NSP3:P1469S, NSP4:V167L, NSP4:T492I, NSP6:T77A, NSP12b:P314L, NSP12b:G662S, NSP13:P77L, NSP14:A394V, NSP16:Q238H, S:T19R, S:T95I*, S:G142D*, S:E156(del), S:L452R, S:T478K, S:D614G, S:P681R, S:D950N, ORF3a:S26L, M:I82T, ORF7a:G70(del), ORF7a:V82A, ORF7a:T120I, ORF7b:T40I, ORF8:D119, N:D63G, N:R203M, N:G215C, N:D377Y	AY.39.1
Wildtype	NSP4:F308Y, ORF3a:G196V, ORF8:L84S, N:P13L, N:S197L	A.2.2

\* Missing sequence data over mutations due to mismatches in primer sequences in one of the three SARS-CoV-2 lineages sequenced (Clinical specimen, 96hour post viral culture. 72hours post-neutralisation).