

Supplemental information

**Interval between prior SARS-CoV-2 infection
and booster vaccination impacts magnitude
and quality of antibody and B cell responses**

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**Table S1: Study subjects and schedules
Related to Table 1**

Study ID	COVID-19 date	Method of COVID-19 diagnosis	Symptomatic COVID-19	Vaccine	Dose 1 date	Dose 2 date	Booster date	Days dose 1 to booster	Days COVID-19 to booster	Days booster to COVID-19	Gender at birth	Age - years	Days booster to Day 30	Days booster to Day60
00001				Moderna	1/4/21	2/3/21	12/2/21	332			Male	65	32	60
00002				Moderna	12/29/20	1/26/21	12/7/21	343			Female	58	31	56
00003				Moderna	1/4/21	1/29/21	11/18/21	318			Female	44	29	56
00004				Moderna	1/15/21	2/11/21	11/19/21	308			Male	36	26	56
00005				Moderna	1/20/21	2/17/21	11/17/21	301			Male	53	29	58
00006				Moderna	3/15/21	4/12/21	11/17/21	247			Male	36	28	64
00007				Moderna	2/18/21	3/18/21	11/1/21	256			Female	64	31	59
00008				Moderna	1/5/21	2/2/21	10/27/21	295			Female	61	28	55
00009				Moderna	1/6/21	2/3/21	12/6/21	334			Male	54	28	59
00011				Moderna	12/29/20	1/27/21	11/22/21	328			Female	51	29	60
00012	1/8/21	PCR	yes	Moderna	2/11/21	3/12/21	12/7/21	299	333		Female	42	30	64
00013				Moderna	1/6/21	2/2/21	11/15/21	313			Female	55	29	59
00014 R				Moderna	1/6/21	2/3/21	12/8/21	336			Female	55	28	57
00015	1/4/22	PCR	yes	Moderna	1/19/21	2/19/21	12/7/21	322		28	Female	56	28	57
00016				Moderna	4/7/21	5/5/21	11/17/21	224			Female	35	28	64
00017				Pfizer	4/7/21	4/28/21	10/28/21	204			Male	65	32	62
00018				Moderna	1/4/21	1/29/21	10/29/21	298			Male	65	31	61
00020				Moderna	12/31/20	1/27/21	11/15/21	319			Female	62	30	59
00021 R	11/28/20	PCR	yes	Pfizer	3/1/21	4/1/21	11/12/21	256	349		Female	31	32	63
00022				Moderna	1/12/21	2/11/21	11/1/21	293			Male	54	29	73
00024				Mixed	3/11/21	4/2/21	11/4/21	238			Male	22	28	60
00025				Moderna	12/28/20	1/26/21	11/18/21	325			Female	58	32	61
00028 R				Moderna	12/29/20	2/26/21	12/7/21	343			Female	53	28	59
00032 R				Moderna	12/28/20	1/25/21	11/15/21	322			Female	60	30	64
00035				Pfizer	3/14/21	4/8/21	11/11/21	242			Male	56	32	57
00041 R				Pfizer	3/3/21	5/24/21	12/17/21	289			Male	64	32	63
00042 R				Moderna	2/12/21	3/13/21	12/11/21	302			Female	49	32	61
00043 R				Moderna	12/30/20	1/27/21	11/15/21	320			Female	60	29	64
00046				Moderna	12/31/20	1/28/21	11/17/21	321			Male	56	28	64
00048 R				Moderna	1/7/21	2/2/21	12/9/21	336			Female	65	32	60
00049 R				Moderna	1/8/21	2/5/21	11/22/21	318			Female	70	28	64
00050				Moderna	1/7/21	2/5/21	11/30/21	327			Female	40	30	56
00055 R				Moderna	1/7/21	2/4/21	11/19/21	316			Female	30	32	60
00056	10/10/21	PCR	no	Moderna	12/31/20	1/28/21	12/8/21	342	59		Female	66	29	64
00057 R				Pfizer	3/17/21	4/7/21	12/6/21	264			Female	21	29	63
00058				Moderna	12/31/20	1/29/21	11/19/21	323			Male	55	31	60
00059 R				Moderna	12/29/20	1/26/21	11/19/21	325			Female	40	32	60
00060 R				Moderna	12/31/20	1/27/21	12/8/21	342			Female	50	30	63
00061 R	9/8/21	PCR	yes	Pfizer	3/8/21	3/29/21	1/4/22	302	118		Male	42	28	56
00063 R	4/8/20	PCR	no	Moderna	12/30/20	1/28/21	11/30/21	335	601		Male	45	29	59
00064 R				Moderna	12/30/20	1/27/21	11/24/21	329			Male	34	28	62
00065 R	8/24/21	PCR	yes	Moderna	2/19/21	1/29/21	12/30/21	314	128		Female	55	28	68
00067 R	1/5/22	PCR	yes	Moderna	4/19/21	5/17/21	11/22/21	217		44	Male	23	30	60
00069 R ^a	1/7/22	PCR/PCR	yes/no	Moderna	2/26/21	1/30/21	11/30/21	277	394	38	Female	47	29	62
00070 R				Moderna	1/22/21	2/21/21	12/9/21	321			Female	63	32	60
00072 R	1/6/22	Ab ^b	yes	Moderna	1/28/21	12/31/20	12/6/21	312		31	Female	46	36	56
00073 R	1/4/22	PCR	yes	Moderna	12/29/20	1/26/21	12/17/21	353		18	Male	41	28	60
00075 R	1/5/22	PCR	yes	Moderna	12/31/20	1/27/21	12/8/21	342		28	Female	27	29	56
00078 R				Moderna	2/25/21	1/30/21	11/29/21	277			Female	62	30	58
00079 R	12/29/21	PCR	yes	Pfizer	12/28/20	1/18/21	12/4/21	341		25	Male	36	30	61
00080				Moderna	3/24/21	4/23/21	11/30/21	251			Female	51	30	58
00081 R				Moderna	12/31/20	1/28/21	12/10/21	344			Female	57	31	62
00082 R	1/6/22	PCR	no	Moderna	1/12/21	2/9/21	12/8/21	330		29	Female	56	29	56
00084 R				Mixed	5/6/21	6/4/21	12/13/21	221			Male	47	29	57
00085 R	1/15/22	Antigen & Ab ^b	yes	Pfizer	1/23/21	2/13/21	12/3/21	314		43	Female	38	32	62
00086 R	12/29/21	PCR	no	Pfizer	3/1/21	3/23/21	12/17/21	291		12	Male	38	32	60
00089 R	1/12/22	PCR	no	Moderna	12/29/20	1/26/21	12/6/21	342		37	Male	35	28	63
00092 R	4/18/20	PCR	yes	Moderna	1/21/21	2/19/21	12/10/21	323	601		Female	58	32	63
00093 R	7/1/21	PCR	yes	Moderna	1/5/21	2/2/21	12/8/21	337	160		Female	51	28	61
00095 R	12/15/20	PCR	yes	Moderna	1/27/21	2/24/21	12/8/21	315	358		Male	46	29	56
00096 R				Moderna	12/31/20	1/28/21	12/10/21	344			Female	44	31	63
00097 R				Pfizer	4/10/21	5/1/21	12/10/21	244			Female	37	31	59
00098	9/19/21	PCR	yes	Moderna	1/5/21	2/15/21	2/2/22	393	136		Female	42	28	56
00099				Moderna	3/25/21	4/23/21	1/6/22	287			Female	32	29	60
00100				Moderna	1/12/21	2/9/21	2/9/22	393			Male	45	28	56
00101	10/19/21	PCR	yes	Pfizer	3/2/21	3/23/21	3/10/22	373	142		Female	43	28	56

Prior infection group

Post infection group

^a 00069 R infected both prior- (11/1/20) and post-boost but grouped with latter

^b Nucleocapsid antibody positive after negative baseline

Table S2: P values for spike-binding serum antibody increase over time or between group pairs Related to Figures 1 and S1

Variant	Unin ^a day 0-30	Unin day 0-60	Unin day 30-60	Prior infected day 0-30	Prior infected day 0-60	^b Prior infected day 30-60	Post infected day 0-30	Post infected day 0-60	Post infected day 30-60	Prior vs unin day 0	^c Prior vs unin day 60	Prior vs Post day 0	^c Prior vs Post day 60	Post vs unin day 0	Post vs unin day 60	Day 60:0 fold unin vs prior	Day 60:0 fold post vs unin	Day 60:0 fold post vs prior
B.1.1.7	<0.0001	<0.0001	ns	0.002	0.002	ns	0.001	0.001	0.0186	<0.0001	ns	0.0014	0.0128	ns	ns	<0.0001	0.0080	<0.0001
B.1.640.2	<0.0001	<0.0001	ns	0.0029	0.0186	0.042	0.001	0.001	0.0322	0.0001	ns	0.0014	0.0052	ns	0.0457	<0.0001	0.0060	<0.0001
BA.1 R346K	<0.0001	<0.0001	ns	0.001	0.0049	0.0096	0.001	0.001	ns	0.0001	0.0065	0.0032	0.0024	ns	ns	<0.0001	0.0174	<0.0001
BA.1 L452R	<0.0001	<0.0001	ns	0.001	0.0029	ns	0.001	0.001	ns	<0.0001	0.0164	0.0032	0.0024	ns	ns	<0.0001	0.0222	<0.0001
BA.2	<0.0001	<0.0001	ns	0.002	0.0049	0.0322	0.001	0.001	0.0244	<0.0001	ns	0.0014	0.0041	ns	0.0249	<0.0001	0.0145	<0.0001
BA.3	<0.0001	<0.0001	ns	0.001	0.0049	0.0137	0.001	0.001	ns	<0.0001	0.008	0.0024	0.0024	ns	ns	<0.0001	0.0174	<0.0001

^aUninfected

^bDecreased from previous timepoint

^cDecreased vs uninfected or post-infected

Table S3: *P* values for group by time interaction for mixed-effects model of spike-binding serum antibody titers Related to Figures 1 and S1

Variant	All	Prior- vs post- infected	Uninfected vs prior-infected	Uninfected vs post-infected
B.1 D614G	<0.0001	<0.0001	<0.0001	0.1589
B.1.1.7	<0.0001	<0.0001	<0.0001	0.0706
B.1.315	<0.0001	<0.0001	<0.0001	0.1589
B.1.617.2	<0.0001	<0.0001	<0.0001	0.1589
B.1.640.2	<0.0001	<0.0001	<0.0001	0.0683
BA.1	<0.0001	<0.0001	<0.0001	0.0683
BA.1 R346K	<0.0001	<0.0001	<0.0001	0.1034
BA.1 L452R	<0.0001	<0.0001	<0.0001	0.1589
BA.2	<0.0001	<0.0001	<0.0001	0.1034
BA.3	<0.0001	<0.0001	<0.0001	0.1589

Table S4: *P* values for group by time interaction for mixed-effects model of frequencies of spike-binding B cells Related to Figures 2 and S3

Spike tetramer	All	Prior- vs post-infected	Uninfected vs prior-infected	Uninfected vs post-infected
B.1 S1	<0.0001	<0.0001	<0.0001	<0.0001
B.1 RBD	<0.0001	<0.0001	<0.0001	<0.0001
B.1 NTD	<0.0001	<0.0001	<0.0001	0.0002
B.1. & BA.1 RBD	<0.0001	<0.0001	<0.0001	<0.0001
B.1. & BA.1 NTD	<0.0001	<0.0001	<0.0001	0.0001

Table S5: *P* values for spike-binding secreted antibody increase over time or between group pairs Related to Figures 3 and S4

Variant	Unin ^a day 0-36	Prior infected day 0-60	Post infected day 0-60	Prior vs unin day 0	^b Prior vs unin day 60	Prior vs post day 0	^b Prior vs post day 60	Post vs unin day 0	Post vs unin day 60	Day 60:0 fold unin vs prior	Day 60:0 fold post vs unin	Day 60:0 fold post vs prior
B.1.1.7	<0.0001	ns	0.001	0.0154	0.007	0.0024	<0.0001	ns	0.0029	<0.0001	0.0002	<0.0001
B.1.640.2	<0.0001	ns	0.001	0.0220	0.006	0.0052	<0.0001	ns	0.0045	<0.0001	0.0004	<0.0001
BA.1 R346K	<0.0001	ns	0.001	ns	0.0001	ns	<0.0001	ns	0.0060	<0.0001	0.0001	<0.0001
BA.1 L452R	<0.0001	ns	0.001	ns	0.0006	ns	<0.0001	ns	0.0039	<0.0001	0.0002	<0.0001
BA.2	<0.0001	ns	0.001	ns	0.0031	ns	<0.0001	ns	0.0031	<0.0001	0.0007	<0.0001
BA.3	<0.0001	ns	0.001	ns	0.0006	ns	<0.0001	ns	0.0033	<0.0001	0.0001	<0.0001

^aUninfected

^bDecreased vs uninfected or post-infected

Table S6: *P* values for group by time interaction for mixed-effects model of spike-binding secreted antibody titers Related to Figures 3 and S4

Variant	All	Prior- vs post-infected	Uninfected vs prior-infected	Uninfected vs post-infected
B.1 D614G	<0.0001	<0.0001	<0.0001	0.0001
B.1.1.7	<0.0001	<0.0001	<0.0001	<0.0001
B.1.315	<0.0001	<0.0001	<0.0001	0.0001
B.1.617.2	<0.0001	<0.0001	<0.0001	0.0001
B.1.640.2	<0.0001	<0.0001	<0.0001	0.0001
BA.1	<0.0001	<0.0001	<0.0001	<0.0001
BA.1 R346K	<0.0001	<0.0001	<0.0001	0.0001
BA.1 L452R	<0.0001	<0.0001	<0.0001	0.0001
BA.2	<0.0001	<0.0001	<0.0001	0.0001
BA.3	<0.0001	<0.0001	<0.0001	0.0001

**Table S7: 21-color flow cytometry panel
Related to Figures 2, 6 and S3**

Antibody or tetramer and fluorochrome
Mouse anti-human CD45 BUV805
Mouse anti-human CD19 BV650
Mouse anti-human CD20 APC-H7
Mouse anti-human CD10 BV510
Mouse anti-human IgG PE-Cy7
Mouse anti-human CD11c BUV395
Mouse anti-human CD3 BV570
Mouse anti-human IgD BV605
Mouse anti-human IgM BV711
Mouse anti-human CD27 BV785
Mouse anti-human CD21 PE/Dazzle594
Mouse anti-human CD38 APC/Fire810
Mouse anti-human CD71 Alexa Fluor 700
Mouse anti-human IgA VioBlue
SARS-CoV-2 S1 B.1 PE
SARS-CoV-2 S-2P B.1 PE-Cy5.5
SARS-CoV-2 RBD B.1 BV421
SARS-CoV-2 RBD BA.1 APC
SARS-CoV-2 S NTD B.1 Alexa Fluor 488
SARS-CoV-2 S NTD BA.1 BUV615
Zombie NIR Fixable Viability Dye