Longitudinal Cohort Analysis of Demographic and Clinical Characteristics Associated with Variations in Antibody Response to BNT162b2 Vaccination Among Healthcare Workers at an Academic Medical Center

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Supplemental Table 1: Comparison of characteristics between the included and excluded study samples.

	Total Sample N=1703	Included N=843	Excluded N=860	P
Age in years, median [IQR]	39.90 [33.59, 51.06]	41.7 [35.2, 52.8]	38.01 [32.41, 49.51]	<0.001
Male sex, n (%)	539 (31.7)	256 (30.4)	283 (32.9)	0.283
Non-white race, n (%)	879 (51.6)	405 (48.0)	474 (55.1)	0.004
Hispanic ethnicity, n (%)	224 (13.2)	86 (10.2)	138 (16.0)	<0.001
Obesity	252 (14.8)	103 (12.2)	149 (17.3)*	0.004
Hypertension	243 (14.3)	128 (15.2)	115 (13.4)*	0.318
Charlson comorbidity index†	0.00 [0.00, 0.00]	0.0 [0.0, 1.0]	0.00 [0.00, 0.00]*	0.009

*The data shown are for the 846 excluded participants who had medical history data available for ascertaining these clinical characteristics (i.e. obesity, hypertension, and Charlson comorbidity index).

†The Charlson comorbidity index weights the clinical conditions into a single score to predict 10-year survival: age, myocardial infarction, heart failure, peripheral vascular disease, stroke, dementia, chronic obstructive pulmonary disease, connective tissue disease, peptic ulcer disease, liver disease, diabetes mellitus, hemiplegia, chronic kidney disease, solid tumor, leukemia, lymphoma and AIDS.

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Supplemental Table 2. Comparison of characteristics between the older and younger study participants.

	Total Sample N=843	Younger Age* N=421	Older Age* N=422	P
Age in years, median [IQR]	41.66 [35.19, 52.80]	35.19 [31.55, 38.02]	52.80 [46.66, 62.25]	<0.001
Male sex, n (%)	256 (30.4)	105 (24.9)	151 (35.8)	0.001
Non-white race, n (%)	405 (48.0)	224 (53.2)	181 (42.9)	0.003
Hispanic ethnicity, n (%)	86 (10.2)	59 (14.0)	27 (6.4)	<0.001
Obesity	103 (12.2)	43 (10.2)	60 (14.2)	0.095
Hypertension	128 (15.2)	21 (5.0)	107 (25.4)	<0.001
Charlson comorbidity index	0.00 [0.00, 1.00]	0.00 [0.00, 0.00]	0.00 [0.00, 1.00]	<0.001

*Age definition based on if participant was younger or older in age than the median cohort age of 41.7 years.

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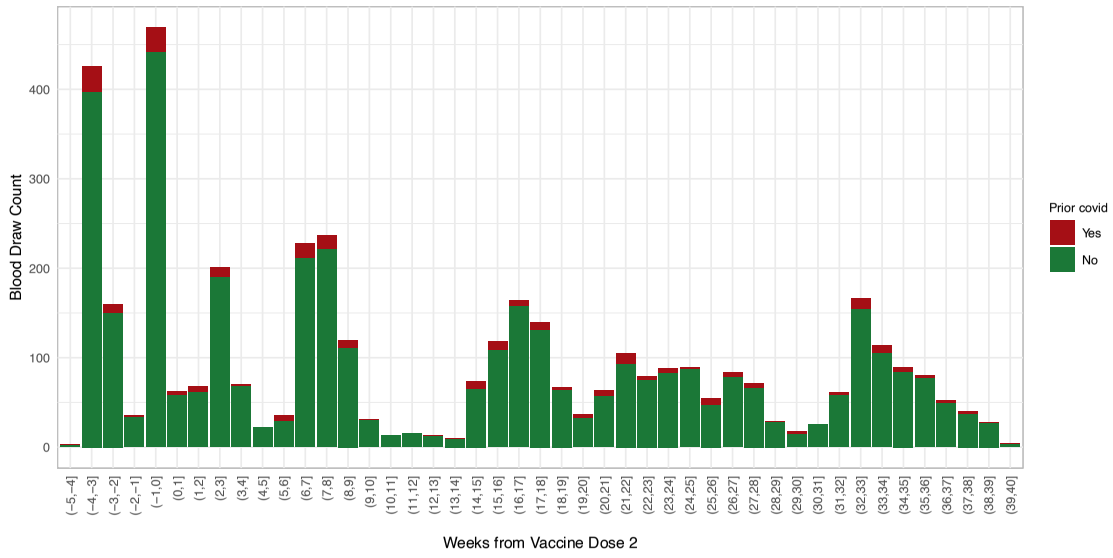
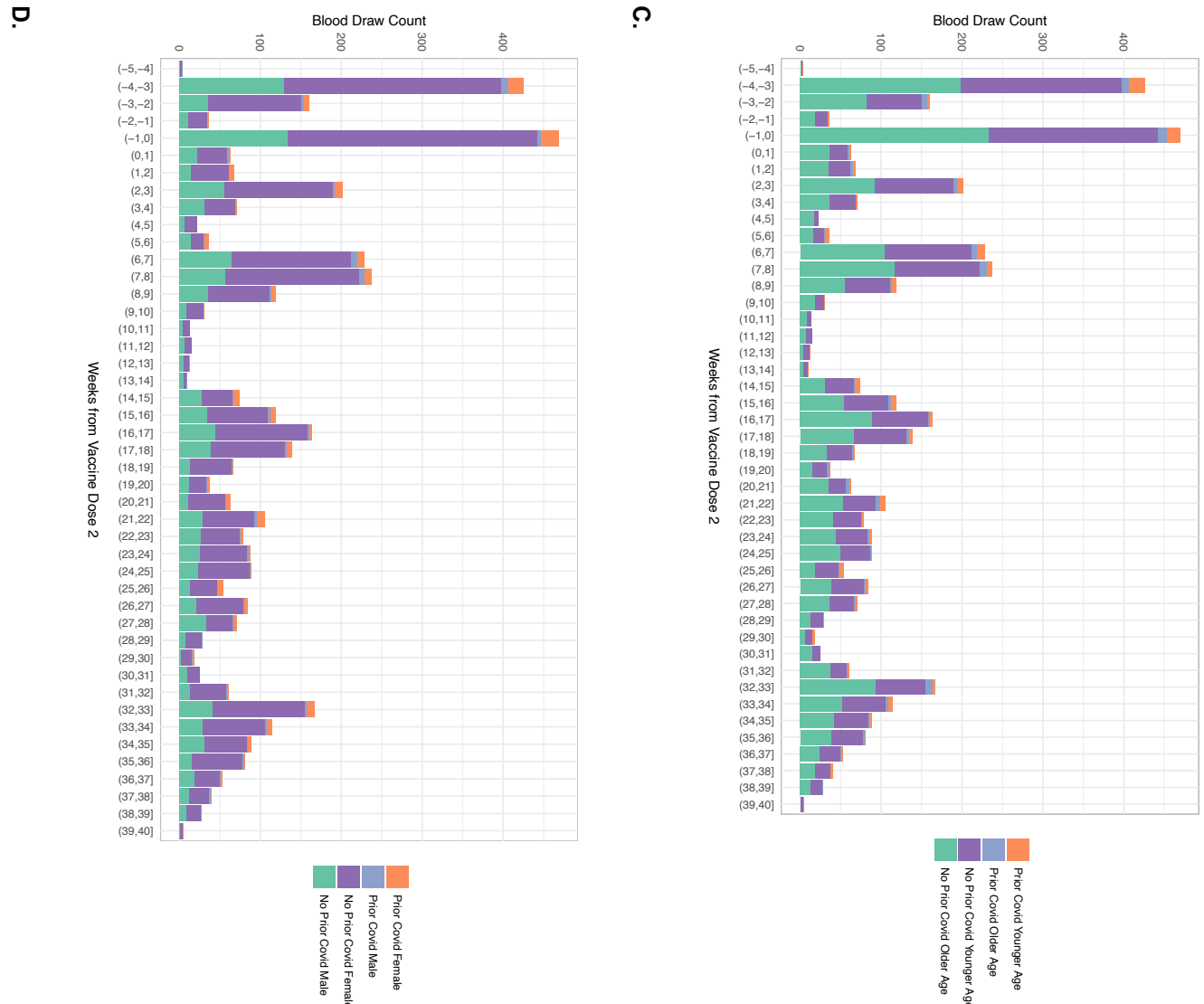
Supplemental Figure 1. Number of available blood samples at each time point, stratified by prior COVID-19 status A) alone, or in combination with B) age, C) sex, and D) hypertension.

A.



B.


C.
Blood Draw Count
0
100
200
300
400
Weeks from Vaccine Dose 2
(−5,−4]
(−4,−3]
(−3,−2]
(−2,−1]
(−1,0]
(0,1]
(1,2]
(2,3]
(3,4]
(4,5]
(5,6]
(6,7]
(7,8]
(8,9]
(9,10]
(10,11]
(11,12]
(12,13]
(13,14]
(14,15]
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(16,17]
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(22,23]
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(25,26]
(26,27]
(27,28]
(28,29]
(29,30]
(30,31]
(31,32]
(32,33]
(33,34]
(34,35]
(35,36]
(36,37]
(37,38]
(38,39]
(39,40]
No Prior Covid Older Age
No Prior Covid Younger Age
Prior Covid Older Age
Prior Covid Younger Age
D.
Blood Draw Count
0
100
200
300
400
Weeks from Vaccine Dose 2
(−5,−4]
(−4,−3]
(−3,−2]
(−2,−1]
(−1,0]
(0,1]
(1,2]
(2,3]
(3,4]
(4,5]
(5,6]
(6,7]
(7,8]
(8,9]
(9,10]
(10,11]
(11,12]
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(27,28]
(28,29]
(29,30]
(30,31]
(31,32]
(32,33]
(33,34]
(34,35]
(35,36]
(36,37]
(37,38]
(38,39]
(39,40]
No Prior Covid Male
No Prior Covid Female
Prior Covid Male
Prior Covid Female

Blood Draw Count
0
100
200
300
400
Weeks from Vaccine Dose 2
(−5,−4]
(−4,−3]
(−3,−2]
(−2,−1]
(−1,0]
(0,1]
(1,2]
(2,3]
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(30,31]
(31,32]
(32,33]
(33,34]
(34,35]
(35,36]
(36,37]
(37,38]
(38,39]
(39,40]
No Prior Covid without Hypertension
No Prior Covid with Hypertension
Prior Covid without Hypertension
Prior Covid with Hypertension

Supplemental Table 3. Clinical and demographic correlates of longitudinal anti-spike IgG antibody response following complete initial mRNA vaccination, including interaction terms for A) age and prior SARS-CoV-2 infection, B) sex and prior SARS-CoV-2 infection, C) hypertension and prior SARS-CoV-2 infection, and D) age and sex.

A.

	Beta*	SE	P	Partial r2
Prior SARS-CoV-2 infection	1.58	0.14	<0·001	0.069
Older age†	-0.29	0.06	<0·001	0·016
Prior SARS-CoV-2 infection : Older age†	0.37	0.23	0.10	0.002
Male sex	-0.28	0·06	<0·001	0.014
Hypertension	-0.21	0·08	0.008	0·005

B.

	Beta*	SE	P	Partial r2
Prior SARS-CoV-2 infection	1.86	0.13	<0.001	0.115
Age	-0.01	0.00	<0.001	0.019
Male sex	-0.24	0.06	<0.001	0.010
Prior SARS-CoV-2 infection : Male sex	-0.42	0.25	0.08	0.002
Hypertension	-0.18	0.08	0.034	0.003

C.

	Beta*	SE	P	Partial r2
Prior SARS-CoV-2 infection	1.61	0.12	<0.001	0.105
Age	-0.01	0.00	<0.001	0.019
Male sex	-0.27	0.06	<0.001	0.013
Hypertension	-0.23	0.08	0.005	0.005
Prior SARS-CoV-2 infection : Hypertension	1.17	0.35	0.001	0.008

D.

	Beta*	SE	P	Partial r2
Prior SARS-CoV-2 infection	1.72	0.11	<0.001	0.133
Older Age†	-0.20	0.07	0.005	0.005
Male sex	-0.15	0.09	0.11	0.002
Older Age† x Male sex (*interaction term*)	-0.25	0.12	0.043	0.003
Hypertension	-0.22	0.08	0.007	0.005

*Beta values represent increase in 1-SD of log(10)IgG-S level per presence (vs absence) of a categorical variable or per unit increment of continuous variable).

† Older age defined as age greater than the median age of the cohort (41.7 years).

Supplemental Table 4. Correlates of longitudinal anti-spike IgG antibody response following complete initial mRNA vaccination, stratified by prior SARS-CoV-2 infection status.

	No Prior SARS-CoV-2 Infection N=784			Prior SARS-CoV-2 Infection N=59		
	Beta*	SE	P	Beta*	SE	P
Age, year	-0·01	0·00	<0·001	-0·00	0·01	0·74
Male sex	-0·24	0·06	<0·001	-0·72	0·33	0·032
Hypertension	-0·23	0·08	0·005	0·96	0·50	0·06

*Beta values represent increase in 1-SD of log(10)IgG-S level per presence (vs absence) of a categorical variable or per unit increment of continuous variable), in analyses adjusted for age, sex, and hypertension.

Supplemental Table 5. Association of prior SARS-CoV-2 infection with longitudinal anti-spike IgG antibody response following complete initial mRNA vaccination, stratified by age, sex, and hypertension status.

A.

	Age <42 years N=421			Age ≥42 years N=422		
	Beta*	SE	P	Beta*	SE	P
Prior SARS-CoV-2 infection	1·57	0·13	<0·001	1·93	0·19	<0·001

*Beta values represent increase in 1-SD of log(10)IgG-S level per presence (vs absence) of a categorical variable or per unit increment of continuous variable), in analyses adjusted sex and hypertension.

B.

	Males N=256			Females N=587		
	Beta*	SE	P	Beta*	SE	P
Prior SARS-CoV-2 infection	1·35	0·20	<0·001	1·86	0·13	<0·001

*Beta values represent increase in 1-SD of log(10)IgG-S level per presence (vs absence) of a categorical variable or per unit increment of continuous variable), in analyses adjusted for age and hypertension.

C.

	No Hypertension N=715			Hypertension N=128		
	Beta*	SE	P	Beta*	SE	P
Prior SARS-CoV-2 infection	1·61	0·11	<0·001	2·77	0·43	<0·001

*Beta values represent increase in 1-SD of log(10)IgG-S level per presence (vs absence) of a categorical variable or per unit increment of continuous variable), in analyses adjusted for age and sex.

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