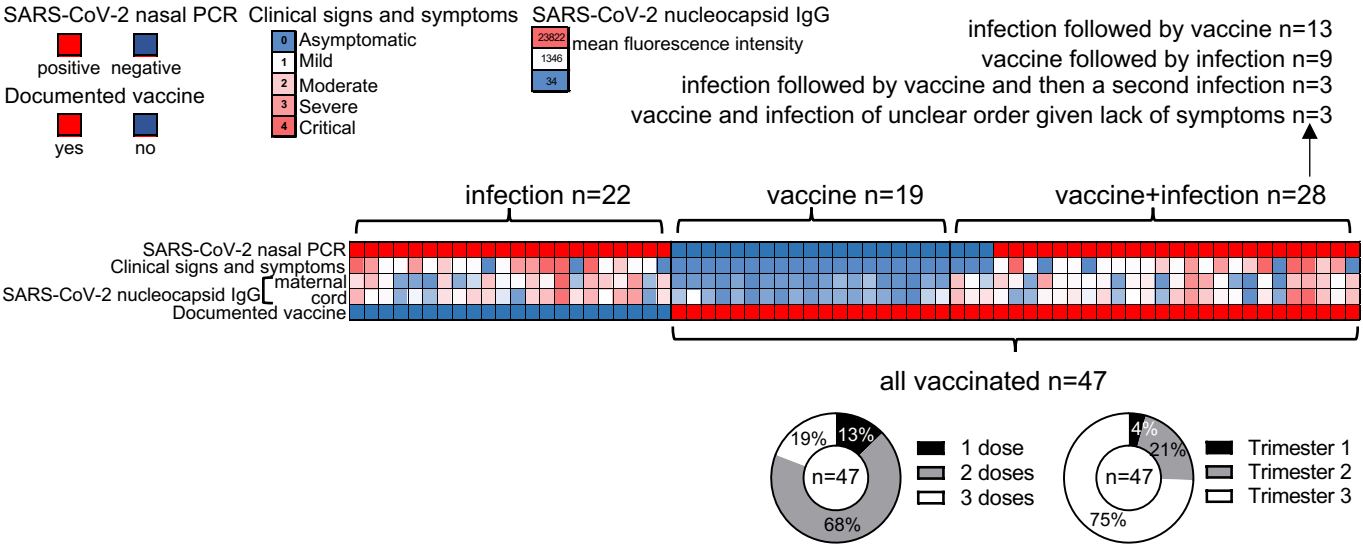
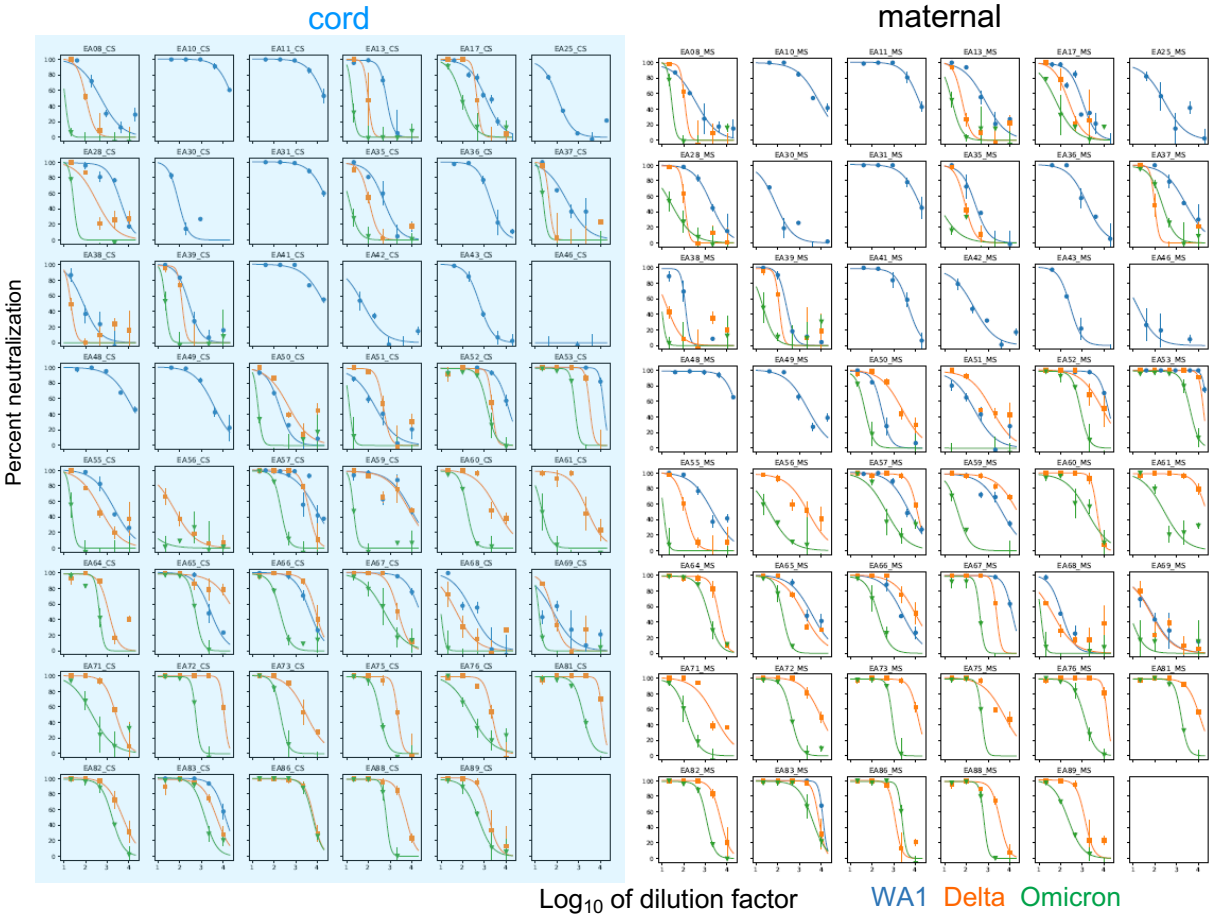
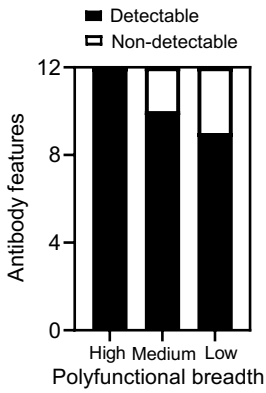


Supplemental Figure 1: Laboratory and clinical data were used to define infection and vaccine groups. Heatmap depicts results from SARS-CoV-2 nasal PCR, clinical signs and symptoms with respect to COVID-19 from asymptomatic to critical disease ascertained by chart review, SARS-CoV-2 nucleocapsid IgG in maternal and cord samples and documentation of BNT162b2 or mRNA-1273 vaccination during pregnancy in the medical record. Disease severity in pregnancy was classified as asymptomatic (no symptoms), mild (upper respiratory or mild febrile illness without lower respiratory symptoms), moderate (lower respiratory symptoms without oxygen requirement, with SpO2 ≥94% on room air), severe (oxygen requirement, or SpO2 <94% on room air), or critical (respiratory failure, mechanical ventilation, or ECMO). Pie charts depict the percentage of individuals received vaccine doses (left chart) and the percentage of individuals received last dose vaccine during three trimesters before delivery (right chart).

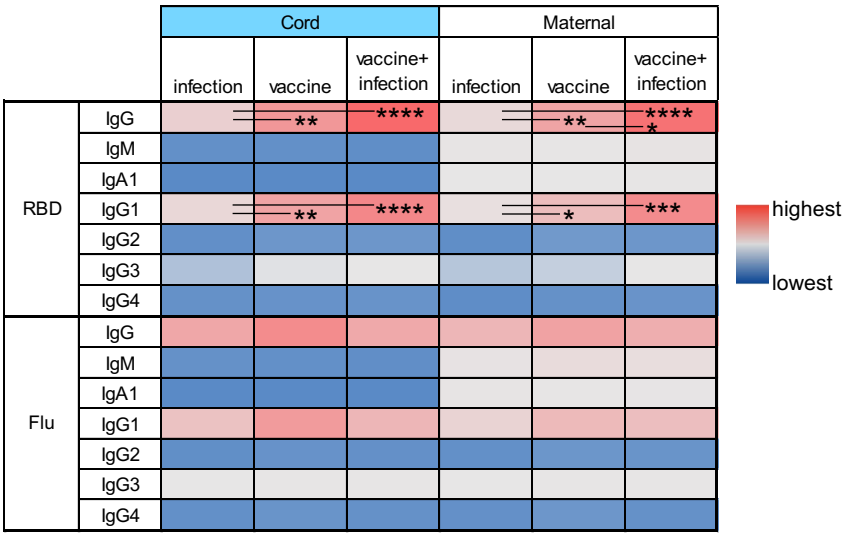


Supplemental Figure 2: FRNT50 were calculated from neutralization graphs generated in focus forming assays for each SARS-CoV-2 WT and clinical variants. Each graph shows the data for one individual sample.

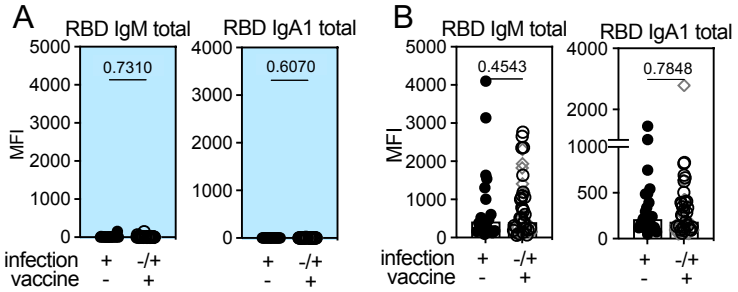


Antibody features
WA1 FRNT
Delta FRNT
Omicron FRNT
RBD ADNKA CD107a
RBD ADNKA IFN$_\gamma$
RBD ADNKA TNF$_\alpha$
RBD ADCD
RBD ADCP
RBD CD16a
RBD CD32a
RBD CD32b
RBD FcRn

Supplemental Figure 3: SARS-CoV-2 reactive polyfunctional breadth was calculated for each individual sample with all 12 features listed. In this cohort, individual responses fell into three main categories: those with high (90-100%), medium (80-90%) and low (<80%) proportion of functions detected.

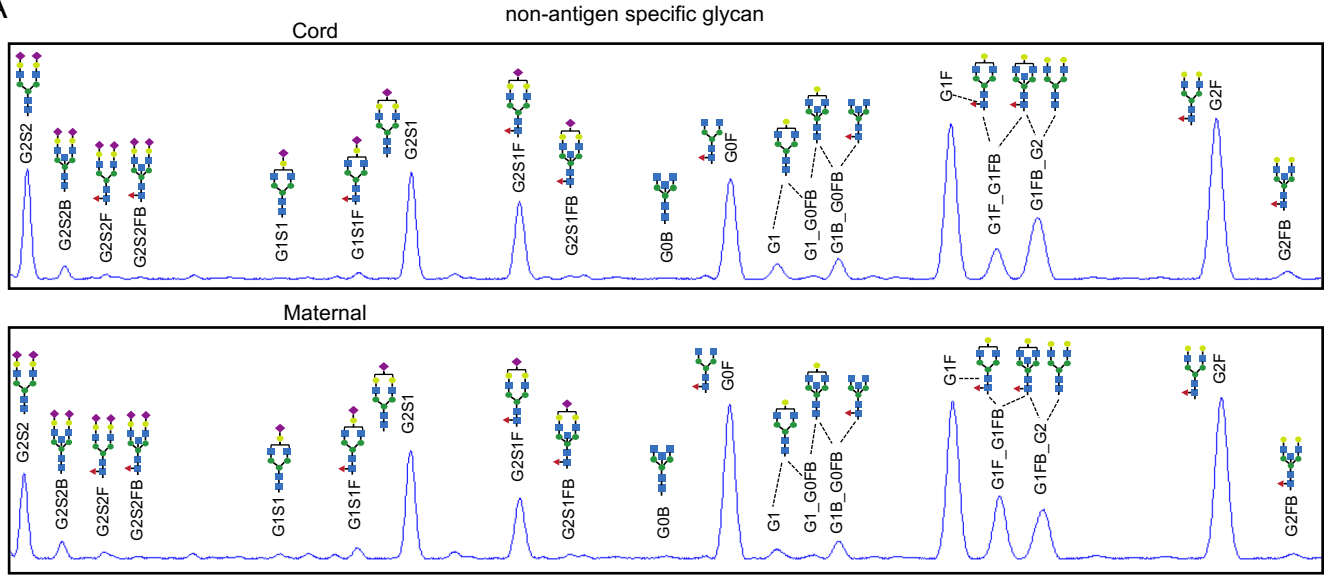


Supplemental Figure 4: No changes are observed in control influenza hemagglutinnin (Flu) compared to SARS-CoV-2 receptor binding domain (RBD) specific antibody levels in infant cord and maternal blood. The heatmap shows the median titers of antigen specific immunoglobulin isotypes (IgG, IgM, IgA1) and subclasses (IgG1, IgG2, IgG3, IgG4) within the three clinical groups from cord and maternal samples. P values are adjusted for maternal age and BMI using linear regression. * $p \leq 0.05$; ** $p \leq 0.01$; *** $p \leq 0.001$; **** $p \leq 0.0001$.

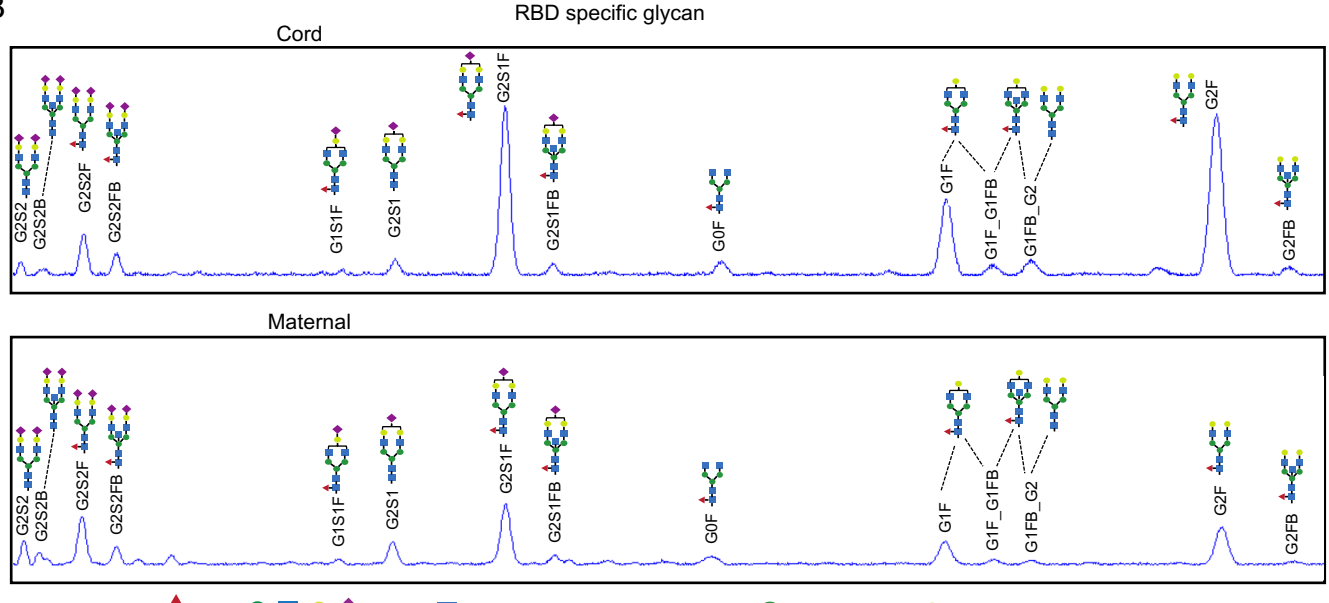


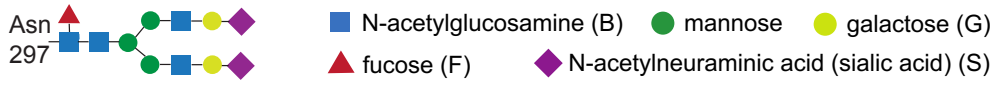
Supplemental Figure 5: No significant differences are observed in RBD IgM or IgA in maternal and infant cord blood with respect to immune exposure. Dot plots show the magnitude of RBD total IgM and IgA1 in (**A**) cord and (**B**) maternal samples. P values are adjusted for maternal age and BMI using linear regression.

A



B

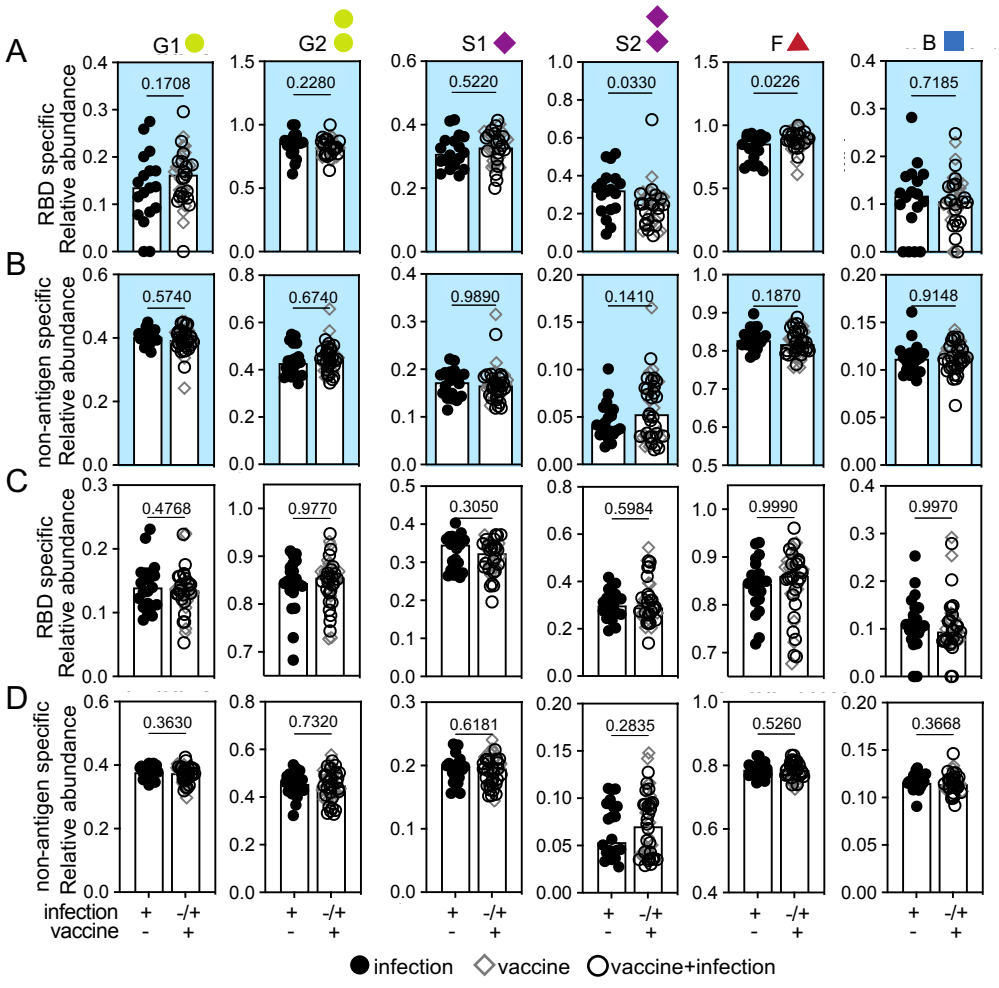




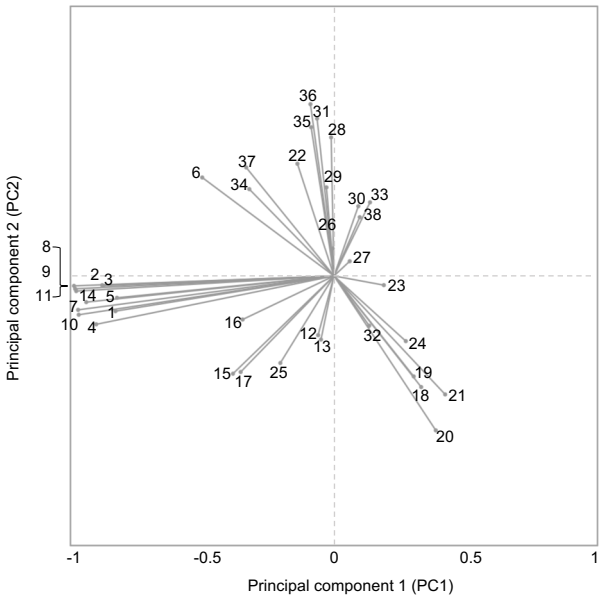
C

Glycoform
total monogalactose (G1) = G1S1+ G1S1F+ G1+ G1_G0FB+ G1B_G0FB+ G1_2 +G1F+ G1F_G1FB+ G1FB_G2
total digalactose (G2) = G2S2+ G2S2B+ G2S2F+ G2S2FB+ G2S1+ G2S1F+ G2S1FB+ G2F+ G2FB
total mono sialic acid (S1) = G1S1+ G1S1F+ G2S1+ G2S1F+ G2S1FB
total disialic acid (S2) = G2S2+ G2S2B+ G2S2F+ G2S2FB
total GlcNac (B) = G2S2B+ G2S2FB+ G2S1FB+ G0B+ G1B_G0FB+ G1FB_G2+ G2FB
total fucose (F) = G2S2F+ G2S2FB+ G1S1F+ G2S1F+ G2S1FB+ G0F+ G1F+ G1F_G1FB+ G1FB_G2+ G2F+ G2FB

Supplemental Figure 6: Representative capillary electrophoresis chromatographs for one pair of maternal and infant cord samples show differences in relative RBD specific and non-antigen specific IgG glycosylation. Peaks are identified from bulk total non-antigen (**A**) and receptor binding domain (RBD) (**B**) specific IgG glycans captured and quantified by relative abundance. (**C**) The collective relative abundance of all individual glycoforms with fucose (F), sialic acid (S), galactose (G) and bisecting GlcNAc (B) are calculated.



Supplemental Figure 7: Vaccination in pregnancy changes glycosylation of infant cord and not maternal RBD specific IgG. The relative abundance of glycoforms containing monogalactosylated (G1), digalactosylated (G2), monosialylated (S1), disialylated (S2) and bisecting N-acetylglucosamine (B) structures are depicted for RBD specific (**A** and **C**) and non-antigen specific (**B** and **D**) IgG from cord (**A** and **B**) and maternal (**C** and **D**) blood. For RBD specific IgG glycans, infection n=18, vaccine n=18, vaccine+infection n=19. For non-antigen specific IgG glycans, infection n=20, vaccine n=18, vaccine+infection n=27. Bars represent the median for each group. P values are adjusted for maternal age and BMI using linear regression.



Variable	RBD features	PC1	PC2
1	WA1	-0.829365822	-0.130694234
2	CD107a	-0.879750329	-0.03441598
3	IFNγ	-0.875513728	-0.036394076
4	TNFα	-0.902394378	-0.179475936
5	ADCD	-0.82377986	-0.081112146
6	ADCP	-0.500077593	0.365078861
7	CD16a	-0.971176365	-0.125785108
8	CD32a	-0.98683963	-0.036924136
9	CD32b	-0.982416837	-0.047820267
10	FcRN	-0.968775822	-0.144040576
11	IgG	-0.978406308	-0.056341424
12	IgA1	-0.060366858	-0.219808209
13	IgM	-0.049312994	-0.236050624
14	IgG1	-0.940278518	-0.097271239
15	IgG2	-0.383402669	-0.362721387
16	IgG3	-0.346759699	-0.161701352
17	IgG4	-0.354224164	-0.356439308
18	G2S2	0.330937016	-0.412227153
19	G2S2B	0.302646404	-0.372773369
20	G2S2F	0.386347774	-0.572894941
21	G2S2FB	0.421904424	-0.439576598
22	G1S1	-0.138775776	0.416057965
23	G1S1F	0.189177582	-0.034179648
24	G2S1	0.272603426	-0.241883427
25	G2S1F	-0.203670579	-0.323033316
26	G0	-0.005134646	0.101316486
27	G1S1FB	0.059655922	0.054464353
28	G0B	-0.01090129	0.513848784
29	G0F	-0.028533342	0.328413394
30	G1	0.092375075	0.258601151
31	G1_G0FB	-0.064162778	0.583706632
32	G1B_G0FB	0.133663612	-0.184760757
33	G1_2	0.136748855	0.27299171
34	G1F	-0.32144356	0.321934859
35	G1F_G1FB	-0.086844402	0.551447453
36	G1FB_G2	-0.089433477	0.637069014
37	G2F	-0.333304865	0.402463557
38	G2FB	0.097743711	0.217831315

Supplemental Figure 8: Variability in all maternal and infant cord antibody data is captured most by SARS-CoV-2 antibody functions (PC1) and second most by RBD IgG glycans. PC scores of each of the 38 RBD specific antibody features in the loadings plot (left) are shown in the table (right).