SUPPLEMENTARY INFORMATION

ACE2 Competitive Binding Assay Method:
Briefly, 2019 SARS CoV2 RBD, B.1.1.7 RBD, or B.1.351 RBD variants were pre-coated in microtiter plate wells (as received). Diluted blood serum and dilutions of PBS-T eluted dried blood spot samples were then mixed with ACE2 protein and distributed to individual wells. In one study, serum and eluted sample from dried blood samples were serially dilute in a 1:5 dilution series and then subjected to the competitive assay. In the second study, serum and eluted sample from dried blood samples were diluted to the same concentration used for GC-FP and then subjected to the competitive assay. Competitive assay plates were incubated overnight at 4 °C after addition of sample and ACE2 protein. Wells were then washed 4X with 300 µl Ray Biotech wash solution, followed by introduction of an anti-ACE2 labeling antibody. After incubation at RT for 1 hr, wells were again washed 4X with wash solution, followed by introduction of HRP-labeled secondary antibody and incubation for an additional 1 hr. After a final 4X wash step, colorimetric reagent was added and plates were incubated for 30 min at room temp, followed by addition of stop solution and absorbance reading at 450 nm.
Table S1. Subject information for individuals who were infected with COVID-19 or vaccinated with the Pfizer-BioNTech, Moderna, or Johnson & Johnson vaccines. Blood serum samples from acutely infected individuals (hospitalized) were collected during hospitalization, while dried blood spots from infected (non-hospitalized) individuals were collected at least 4 weeks post recovery. For vaccinated individuals, dried blood spots samples were collected at least 2 weeks after the final dose of vaccine.

| Vaccine / Exposure Type         | Sample # | Gender | Age (weeks) | Weeks past 2nd dose | Weeks Since Positive Diagnosis | Sample Type |
|--------------------------------|-----------|--------|-------------|---------------------|-------------------------------|-------------|
| Pfizer                         | 1         | M      | 54          | 2                   | n/a                           | Dried Blood Spot |
| Pfizer                         | 2         | M      | 43          | 2                   | n/a                           | Dried Blood Spot |
| Pfizer                         | 3         | F      | 54          | 2                   | n/a                           | Dried Blood Spot |
| Pfizer                         | 4         | M      | 57          | 2                   | n/a                           | Dried Blood Spot |
| Pfizer                         | 5         | M      | 34          | 8.5                 | n/a                           | Dried Blood Spot |
| Pfizer                         | 6         | F      | 38          | 4                   | n/a                           | Dried Blood Spot |
| Pfizer                         | 7         | F      | 42          | 2                   | n/a                           | Dried Blood Spot |
| Pfizer                         | 8         | M      | 72          | 2                   | n/a                           | Dried Blood Spot |
| Pfizer                         | 9         | M      | 61          | 2                   | n/a                           | Dried Blood Spot |
| Pfizer                         | 10        | F      | 66          | 2                   | n/a                           | Dried Blood Spot |
| Pfizer                         | 11        | M      | 67          | 2                   | n/a                           | Dried Blood Spot |
| Pfizer                         | 12        | M      | 37          | 4                   | n/a                           | Dried Blood Spot |
| Pfizer                         | 13        | F      | 43          | 4                   | n/a                           | Dried Blood Spot |
| Pfizer                         | 14        | F      | 64          | 2                   | n/a                           | Dried Blood Spot |
| Pfizer                         | 15        | M      | 73          | 3                   | n/a                           | Dried Blood Spot |
| Pfizer                         | 16        | M      | 24          | 2                   | n/a                           | Dried Blood Spot |
| Pfizer                         | 17        | M      | 44          | 2                   | n/a                           | Dried Blood Spot |
| Moderna                        | 1         | F      | 69          | 2                   | n/a                           | Dried Blood Spot |
| Moderna                        | 2         | M      | 69          | 2                   | n/a                           | Dried Blood Spot |
| Moderna                        | 3         | F      | 28          | 5                   | n/a                           | Dried Blood Spot |
| Moderna                        | 4         | F      | 57          | 2                   | n/a                           | Dried Blood Spot |
| Moderna                        | 5         | F      | 70          | 2                   | n/a                           | Dried Blood Spot |
| Moderna                        | 6         | M      | 53          | 2                   | n/a                           | Dried Blood Spot |
| Moderna                        | 7         | F      | 33          | 2                   | n/a                           | Dried Blood Spot |
| Moderna                        | 8         | M      | 38          | 2                   | n/a                           | Dried Blood Spot |
| Johnson & Johnson             | 1         | M      | 65          | 6.5                 | n/a                           | Dried Blood Spot |
| Johnson & Johnson             | 2         | M      | 42          | 2                   | n/a                           | Dried Blood Spot |
| Johnson & Johnson             | 3         | M      | 24          | 2                   | n/a                           | Dried Blood Spot |
| Johnson & Johnson             | 4         | M      | 29          | 2.5                 | n/a                           | Dried Blood Spot |
| Johnson & Johnson             | 5         | M      | 58          | 4                   | n/a                           | Dried Blood Spot |
| Johnson & Johnson             | 6         | F      | 39          | 2                   | n/a                           | Dried Blood Spot |
| Johnson & Johnson             | 7         | M      | 34          | 3                   | n/a                           | Dried Blood Spot |
| Johnson & Johnson             | 8         | F      | 19          | 4                   | n/a                           | Dried Blood Spot |
| Johnson & Johnson             | 9         | M      | 33          | 4                   | n/a                           | Dried Blood Spot |
| Previously Infected + Pfizer  | 1         | M      | 50          | 5                   | 18                            | Dried Blood Spot |
| Previously Infected + Pfizer  | 2         | F      | 49          | 6                   | 18                            | Dried Blood Spot |
| Previously Infected + Pfizer  | 3         | M      | 81          | 8                   | 7.5                           | Dried Blood Spot |
| Previously Infected + Moderna | 4         | F      | 56          | 2                   | 7.5                           | Dried Blood Spot |
| Previously Infected + Pfizer  | 5         | F      | 18          | 2                   | 22.5                          | Dried Blood Spot |
| Previously Infected + Pfizer  | 6         | F      | 57          | 1.5                 | 4.5                           | Dried Blood Spot |
| Previously Infected + Pfizer  | 7         | M      | 55          | 2                   | 9                             | Dried Blood Spot |
| Previously Infected + Moderna | 8         | F      | 38          | 3                   | 20                            | Dried Blood Spot |
| Previously Infected + Moderna | 9         | M      | 68          | 4                   | 54                            | Dried Blood Spot |
| Previously Infected - non Hospitalized | 1 | M | 74 | n/a | 14 | Dried Blood Spot |
| Previously Infected - non Hospitalized | 2 | M | 66 | n/a | 5 | Dried Blood Spot |
| Previously Infected - non Hospitalized | 3 | M | 56 | n/a | 7 | Dried Blood Spot |
| Previously Infected - Hospitalized | AR7 | De-identified | n/a | <1 | Serum |
| Previously Infected - Hospitalized | AR21 | De-identified | n/a | <1 | Serum |
| Previously Infected - Hospitalized | GS12 | De-identified | n/a | <1 | Serum |
| Previously Infected - Hospitalized | GS14 | De-identified | n/a | <1 | Serum |
| Previously Infected - Hospitalized | GS17 | De-identified | n/a | <1 | Serum |

Total Male: 28  
Total Female: 18  
Median Age: 53.5
Table S2. Subject information (Pfizer-BioNTech vaccinated). Dried blood samples were collected just prior to the 1\textsuperscript{st} dose, at the time of the 2\textsuperscript{nd} dose, and 2 weeks after the 2\textsuperscript{nd} dose.

| Vaccine / Exposure Type | Sample # | Gender | Age | Sample Type       |
|------------------------|----------|--------|-----|-------------------|
| Pfizer                 | 1        | M      | 43  | Dried Blood Spot  |
| Pfizer                 | 2        | M      | 36  | Dried Blood Spot  |
| Pfizer                 | 3        | F      | 57  | Dried Blood Spot  |
| Pfizer                 | 4        | F      | 54  | Dried Blood Spot  |
| Pfizer                 | 5        | M      | 60  | Dried Blood Spot  |
| Pfizer                 | 6        | F      | 42  | Dried Blood Spot  |
| Pfizer                 | 7        | M      | 61  | Dried Blood Spot  |
| Pfizer                 | 8        | M      | 23  | Dried Blood Spot  |
| Pfizer                 | 9        | F      | 42  | Dried Blood Spot  |
| Pfizer                 | 10       | M      | 44  | Dried Blood Spot  |
Figure S1. GC-FP SARS CoV2 antigen chip.

| Antigen                                                                 | Spot Numbers |
|------------------------------------------------------------------------|--------------|
| Human IgG (positive control)                                           | 0, 3, 28     |
| SARS CoV2 RBD – B.1.1.7 (N501Y)                                       | 1, 11, 20    |
| SARS CoV2 RBD – B.1.351 (K417N, E484K, N501Y)                         | 2, 12, 21    |
| 2019 SARS CoV2 RBD                                                     | 4, 13, 22    |
| 2019 SARS CoV2 S1S2+ECD                                               | 5, 14, 23    |
| 2019 SARS CoV2 S1                                                      | 6, 15, 24    |
| SARS CoV2 S1 – B.1.351 (K417N, E484K, N501Y, D614G)                   | 7, 16, 25    |
| SARS CoV2 S1 – B.1.1.7 (ΔHV69-70, ΔY144, N501Y, A570D, D614G, P681H) | 8, 17, 26    |
| 2019 SARS CoV2 Nucleocapsid (N)                                        | 9, 18, 27    |
| Human Serum Albumin / HSA (negative control)                           | 10, 19, 29, 30, 31 |
Figure S2. **A**) Human IgG levels against SARS CoV2 antigens, measured by GC-FP, for vaccinated individuals vs. unvaccinated individuals. The Mann-Whitney test and ROC analysis (see supplementary figure S2) were used to determine statistical significance (*p = 0.03, **p = 0.002, ***p = 0.0002, ****p < 0.0001). **B**) ROC analysis of human IgG levels (measured by GC-FP) against 2019 SARS CoV2 for vaccinated vs. unvaccinated individuals. Area under the curve (AUC) and the GC-FP diagnostic ratio threshold are reported. The GC-FP diagnostic ratio threshold needed to achieve 100% specificity (false positive rate) is reported, as well as the sensitivity (true positive rate) that can be achieved while maintaining 100% specificity.
Figure S3. Human IgG levels against SARS CoV2 antigens from the original 2019 SARS CoV2 strain and variant strains B.1.1.7 and B.1.351. GC-FP diagnostic ratio is reported as a measure of IgG level against each antigen, for multiple exposure scenarios and vaccination status (hospitalized and non-hospitalized CoV2 positive, previously CoV2 positive with subsequent vaccination, and at least 2 weeks past vaccination with Pfizer-BioNTech, Moderna or Johnson & Johnson vaccine). One-way ANOVA followed by Dunnett’s multiple comparison testing was performed (*p = 0.03, ** p = 0.002, *** p = 0.0002, **** p < 0.0001).
Figure S4. Correlation of the fold change in ACE2 binding inhibition or GC-FP diagnostic ratio for B.1.1.7 and B.1.351 variants of RBD vs. 2019 CoV2 RBD.

Pearson $r = 0.8958$

$R$ square $= 0.8024$