Supplemental Material

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**Supplemental Table 1. Univariate risk factors for vaccine non-response two doses of SARS-CoV-2 mRNA vaccine BNT162b2 (N=173)**

| Characteristics | Anti-S < 50 AU/mL N=7 | Anti-S ≥ 50 AU/mL N=166 | RR (95% CI)     | p     |
|-----------------|-----------------------|--------------------------|-----------------|-------|
| Age ≥ 60 years  | 3 (43)                | 89 (54)                  | 0.66 (0.15 – 2.86) | 0.71  |
| Men             | 5 (71)                | 87 (52)                  | 2.20 (0.44 – 11.04) | 0.45  |
| Race            |                       |                          | Reference       |       |
| Black           | 5 (71)                | 142 (86)                 |                 |       |
| Other           | 2 (29)                | 24 (15)                  | 2.26 (0.46 – 11.04) | 0.28  |
| Body Mass Index (kg/m²) |           |                          |                 |       |
| Normal or underweight (<25) | 4 (40)    | 48 (28)                  | Reference       |       |
| Overweight or obese (≥ 25) | 6 (60)   | 123 (72)                 | 2.30 (0.28 – 18.64) | 0.68  |
| Etiology of ESRD |                      |                          |                 |       |
| Diabetes mellitus | 0 (0)          | 64 (39)                  | Undefined       | 0.047 |
| Hypertension    | 4 (57)                | 112 (68)                 | 0.66 (0.15 – 2.83) | 0.69  |
| Glomerular diseases | 0 (0)       | 14 (8)                   | Undefined       | 1.00  |
| Polycystic kidney disease | 0 (0) | 5 (3)                    | Undefined       | 1.00  |
| Other           | 4 (57)                | 45 (27)                  | 3.37 (0.78 – 14.53) | 0.10  |
| Dialysis Access in Use |         |                          |                 |       |
| AVF             | 3 (43)                | 81 (49)                  | Reference       |       |
| AVG             | 1 (14)                | 39 (24)                  | 0.67 (0.07-6.18)  | 0.72  |
| HD catheter     | 2 (29)                | 23 (14)                  | 2.82 (0.51-15.60) | 0.23  |
| PD catheter     | 1 (14)                | 23 (14)                  | 1.04 (0.11-9.55)  | 0.97  |
| Dialysis Modality |                |                          |                 |       |
| In-center HD    | 6 (86)                | 143 (86)                 | Reference       |       |
| PD              | 1 (14)                | 23 (14)                  | 1.03 (0.13 – 8.22) | 1.00  |
| Dialysis Vintage, years <1 | 3 (43)    | 25 (15)                  | Reference       |       |
| 1-3             | 2 (29)                | 61 (37)                  | 0.31 (0.05 – 1.84) | 0.20  |
| >3              | 2 (29)                | 79 (48)                  | 0.24 (0.04 – 1.43) | 0.12  |
| Comorbid conditions |            |                          |                 |       |
| Diabetes        | 0 (0)                 | 84 (51)                  | Undefined       | 0.01  |
| Hypertension requiring anti-hypertensive medications | 2 (29) | 146 (88) | 0.07 (0.01 – 0.33) | <0.001 |
| Coronary artery disease | 2 (29) | 46 (28) | 1.04 (0.21 – 5.19) | 1.00  |
| Cerebrovascular accident | 1 (14) | 26 (16) | 0.90 (0.11 – 7.14) | 1.00  |
| Congestive heart failure | 4 (57) | 52 (31) | 2.79 (0.65 – 12.03) | 0.22  |
| Neurological disease | 1 (14) | 19 (11) | 1.28 (0.16 – 10.05) | 0.58  |
| Lung disease    | 0 (0)                 | 26 (16)                  | Undefined       | 0.60  |
| Cirrhosis       | 0 (0)                 | 4 (2)                    | Undefined       | 1.00  |
| Active hepatitis C | 0 (0)       | 6 (4)                    | Undefined       | 1.00  |
| HIV with CD4 < 200 cells/mcL | 1 (14) | 1 (1) | 14.25 (2.90 – 70.11) | 0.08  |
| Previous COVID-19 infection | 0 (0) | 25 (15) | Undefined       | 0.60  |
| Sickle cell disease | 0 (0)       | 3 (2)                    | Undefined       | 1.00  |
| Active malignancy | 1 (10)       | 7 (4)                    | 3.44 (0.47 – 25.26) | 0.29  |
| Autoimmune disease | 1 (14)      | 15 (9)                   | 1.64 (0.21 – 12.75) | 0.50  |
| Prior renal transplantation | 2 (29) | 17 (10) | 3.24 (0.68 – 15.57) | 0.17  |
| Current non-renal solid organ transplantation | 1 (14) | 2 (1) | 9.44 (1.59 – 56.17) | 0.12  |
| Active on kidney transplant list | 1 (14) | 24 (15) | 0.99 (0.12 – 7.85) | 1.00  |
| Lack of response to prior hepatitis B vaccination | 4 (57) | 34 (21) | 4.74 (1.11 – 20.26) | 0.04  |

ESRD comorbidity Index
|       | <5   | ≥5  | Reference                  |
|-------|------|-----|---------------------------|
|       | 3 (43)| 116 (70) | 2.94 (0.68 – 12.68) | 0.21 |

**Medications**

| Medication                              | <5   | ≥5  | Reference                  |
|-----------------------------------------|------|-----|---------------------------|
| Systemic corticosteroids<br>a           | 2 (29)| 6 (4) | 8.25 (1.88 – 36.18) | 0.04 |
| Hydroxychloroquine                      | 0 (0) | 4 (2) | Undefined                  | 1.00 |
| Biologic agent<br>b                     | 0 (0) | 2 (1) | Undefined                  | 1.00 |
| Other immunosuppressants<br>c           | 1 (14)| 7 (4) | 3.44 (0.47 – 25.26) | 0.29 |
| Any immunosuppressive medication<br>d   | 2 (29)| 14 (8) | 3.93 (0.83 – 18.62) | 0.13 |
| Active chemotherapy                     | 0 (0) | 0    |                           |    |
| ACEI or ARB                              | 1 (14)| 60 (36)| 0.31 (0.04 – 2.48) | 0.42 |
| Intravenous iron, any type or dose      | 5 (71)| 117 (71)| 1.05 (0.21 – 5.21) | 1.00 |

| Darbepoietin dose per week (mcg)         | < 60 | 60-100 | Reference                  |
|-----------------------------------------|------|--------|---------------------------|
|                                         | 2 (29)| 147 (89) |                           |    |

**Laboratory Data**

| Test                              | <5   | ≥5  |
|-----------------------------------|------|-----|
| Kt/V urea ≥ 1.2 in HD, ≥ 1.7 in PD| 7 (100)| 165 (99) | 1.00 |
| Ferritin (ng/mL)                  | 1097 (138-2592)| 876 (19-2987) | 0.30 |
| nPCR (g/kg/day)                   | 1.20 (0.57-1.41) | 0.88 (0.30-1.79) | 0.20 |

Values are presented as n (%) or median (range).

Anti-S: antibody against the spike protein of SARS-CoV-2; RR: relative risk; CI: confidence interval; ESRD: end-stage renal disease; AVF: arterio-venous fistula; AVG: arterio-venous graft; HD: hemodialysis; PD: peritoneal dialysis; HIV: human immunodeficiency virus; COVID-19: Coronavirus disease 2019; ACEI: angiotensin-converting enzyme inhibitor; ARB: angiotensin II receptor blocker; nPCR: normalized protein catabolic rate

a All prednisone; dose=5 mg (n=6), 7.5 mg (n=1), 20 mg (n=1)
b Both adalimumab
c Tacrolimus (5), azathioprine (2), leflunomide (1)
d Corticosteroids (prednisone), biologic agents (adalimumab), and other immunosuppressants (tacrolimus, azathioprine, leflunomide)
### Supplemental Table 2. Characteristics of Non-responders (those who did not seroconvert) After Receiving Two Doses of SARS-CoV-2 mRNA Vaccine BNT162b2

| Patient | Age (years) | Sex | BMI  | Anti-S level (AU/mL) | Previous COVID-19 | Non-renal transplant | Renal Transplant | Immunosuppressive Medication | Dialysis Modality |
|---------|-------------|-----|------|----------------------|------------------|----------------------|-------------------|-----------------------------|------------------|
| 1       | 61          | M   | 38.6 | 0                    | No               | No                   | No                | No                          | In-center HD     |
| 2       | 41          | M   | 21.6 | 22.2                 | No               | No                   | Yes               | No                          | In-center HD     |
| 3       | 43          | F   | 55.5 | 39.3                 | No               | No                   | No                | No                          | In-center HD     |
| 4       | 70          | M   | 39.9 | 0                    | Yes, heart       | No                   | Yes               | No                          | In-center HD     |
| 5       | 58          | F   | 40.7 | 5.9                  | No               | No                   | No                | No                          | In-center HD     |
| 6       | 55          | M   | 34.1 | 6.6                  | No               | No                   | No                | No                          | In-center HD     |
| 7       | 73          | M   | 29.5 | 3.7                  | No               | No                   | Yes               | Yes                         | PD               |

Anti-S: Antibody against spike protein of SARS-CoV-2; M: Male; F: Female; BMI: Body mass index; COVID-19: Coronavirus 2019; HD: Hemodialysis; PD: Peritoneal dialysis