**Supplementary Table 1: Univariable and Multivariable analyses of the relationship between sociodemographic, health and vaccine-related variables and WT-specific SARS-CoV-2 neutralization one month following a fourth COVID-19 vaccine dose**

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Variable | Log2 viral neutralization against Wild-Type varianta | | | | | | | | | | | |
| Univariable analysisb | | | | | | Multivariable analysisc | | | | | |
| Estimate | | 95% CI | | p-value | | Estimate | | 95% CI | | p-value | |
| Recent CD4+ T-cell count | | 0.0007 | | -0.0009 to 0.002 | | 0.38 | | - | | - | | - | |
| Nadir CD4+ T-cell count | | -0.0002 | | -0.002 to 0.001 | | 0.80 | | - | | - | | - | |
| Age | | -0.003 | | -0.034 to 0.029 | | 0.86 | | - | | - | | - | |
| Male sex | | -0.31 | | -1.45 to 0.82 | | 0.58 | | - | | - | | - | |
| White ethnicity | | 0.04 | | -0.86 to 0.94 | | 0.93 | | - | | - | | - | |
| Number of chronic conditions | | 0.03 | | -0.44 to 0.51 | | 0.89 | | - | | - | | - | |
| Dual ChAdOx1 as initial regimen | | 1.16 | | -0.167 to 2.48 | | **0.09** | | 0.53 | | -0.75 to 1.81 | | 0.41 | |
| Days between first and second vaccine doses | | -0.003 | | -0.045 to 0.038 | | 0.87 | | - | | - | | - | |
| mRNA-1273 as third dose | | 0.21 | | -0.63 to 1.06 | | 0.51 | | - | | - | | - | |
| Days between second and third vaccine doses | | 0.003 | | -0.009 to 0.015 | | 0.64 | | - | | - | | - | |
| mRNA-1273 as fourth dose | | 1.10 | | 0.26 to 1.94 | | **0.01** | | 0.95 | | 0.14 to 1.75 | | **0.02** | |
| Bivalent fourth dose | | 0.47 | | -0.32 to 1.27 | | 0.24 | | - | | - | | - | |
| Days between third and fourth vaccine doses | | 0.01 | | 0.002 to 0.019 | | **0.02** | | 0.009 | | 0.0004 to 0.017 | | **0.04** | |
| Prior SARS-CoV-2 infection (any) | | 0.51 | | -0.35 to 1.37 | | 0.24 | | - | | - | | - | |
| Prior SARS-CoV-2 Omicron infection | | 0.84 | | 0.069 to 1.6 | | **0.03** | | 0.55 | | -0.19 to 1.29 | | 0.14 | |

a Neutralization data (reciprocal plasma dilutions) were log2 transformed prior to multivariable analysis.

b All variables with p<0.1 in univariable analyses were included in the multivariable model.

c We tested for variable multicollinearity using Variance Inflation Factors (VIF). A VIF of 1 indicates that there is no correlation between a given independent variable and any others; VIFs between 1 and 5 suggest moderate correlation, while VIFs greater than 5 represent strong correlation. All VIFs in the present model were ≤ 1.1.