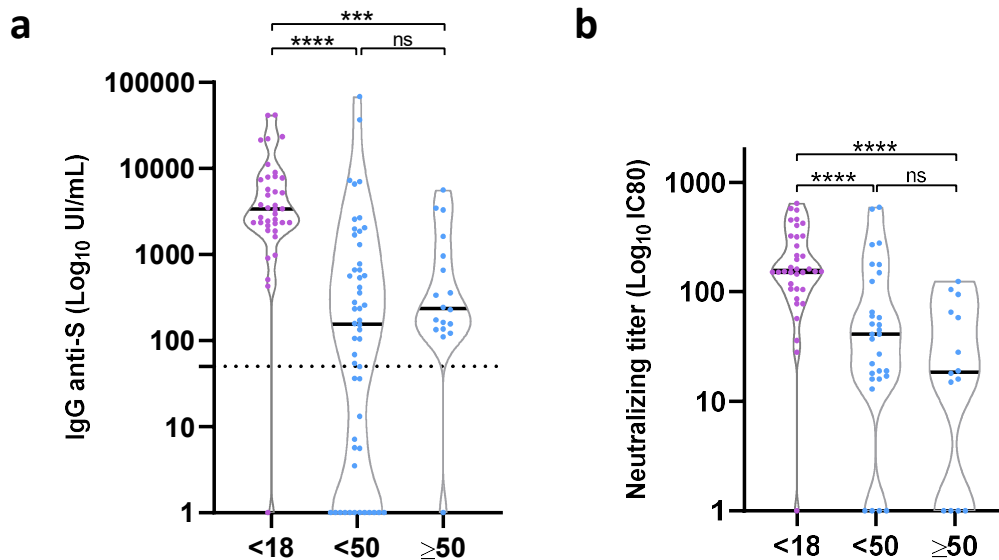


FIGURE S1



Humoral response in Adult and Pediatric patients after second dose of immunization.

a. Anti-S/RBD IgG levels in IEI patients stratified by age at T2. **b.** Neutralizing titer

levels in IEI patients stratified by age at T2. IC₈₀= eighty inhibitory concentration

corresponding to the serum antibody dilution causing a 80% reduction of GFP

positive cells compared to control virus only treated cells. Samples included: adult

patients (<50: n = 52, ≥50: n = 18, blue circles), pediatric patients (<18: n = 38,

purple circles). Samples for neutralizing titers included: adult patients (<50: n=30,

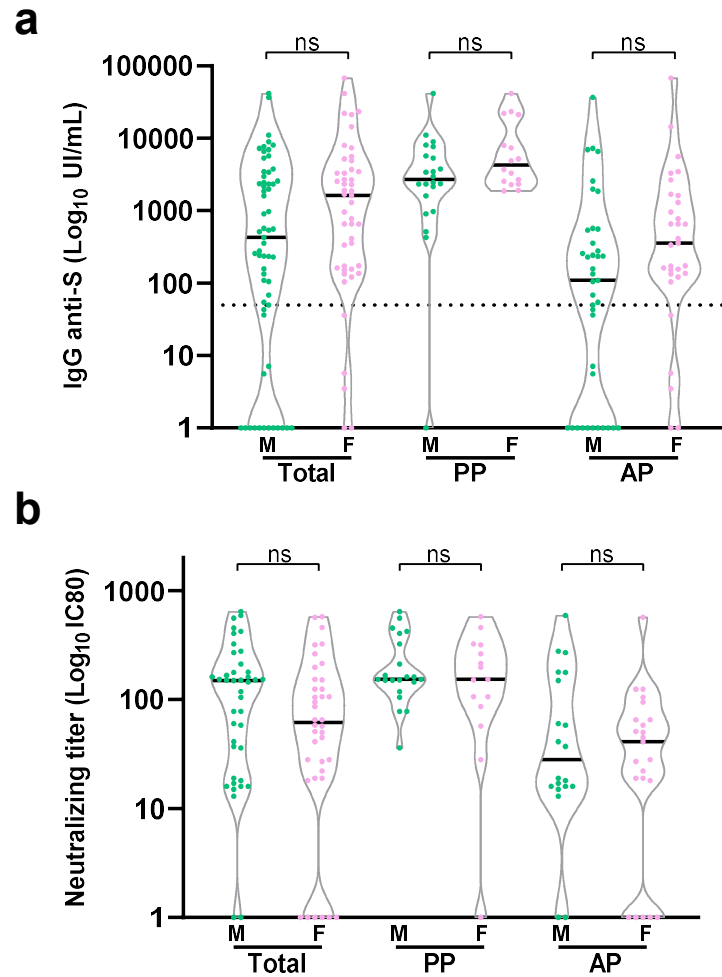
≥50: n = 14, blue circles), pediatric patients (<18: n = 36, purple circles). Dotted line

is the antibody threshold at 50 UI/ml in anti-Spike/RBD antibody titers graphs.

Statistical analysis was performed using Kruskal-Wallis test. *P<0.05, **P<0.01,

P<0.001, *P<0.0001

FIGURE S2

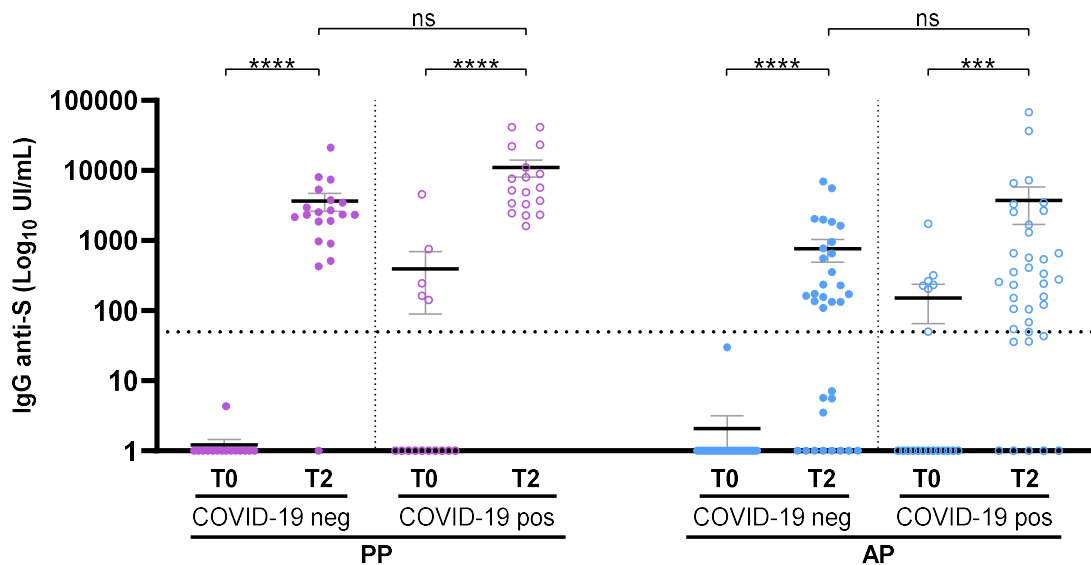


Humoral response in IEI patients after immunization. **a.** Anti-S/RBD IgG levels in total IEI patients, PP and AP, stratified by gender at T2. **b.** Neutralizing titer levels, IC80, in total IEI patients, PP and AP stratified by gender, at T2. M= Male, F= Female, AP=adult patients, PP= pediatric patients, Total= represent the analysis of the total IEI population (AP + PP). IC80= eighty inhibitory concentration corresponding to the serum antibody dilution causing a 80% reduction of GFP positive cells compared to control virus only treated cells.

Dotted line is the antibody threshold at 50 UI/ml in anti-Spike/RBD antibody titers graph. Statistical analysis was performed using Mann-Whitney test.

Samples included: total IEI patients (M: n=61 green circles, F: n=30 pink circles), adult patients (AP, M: n=39 green circles, F: n=31, pink circles), pediatric patients (PP, M: n=22, green circles, F: n=16, pink circles). Samples for neutralizing titers included: total IEI patients (M: n=41 green circles, F: n=38 pink circles), adult patients (AP, M: n=20 green circles, F: n=23, pink circles), pediatric patients (PP, M: n=21, green circles, F: n=15, pink circles).

FIGURE S3



Longitudinal humoral response in IEI patients with or without history of COVID-19.

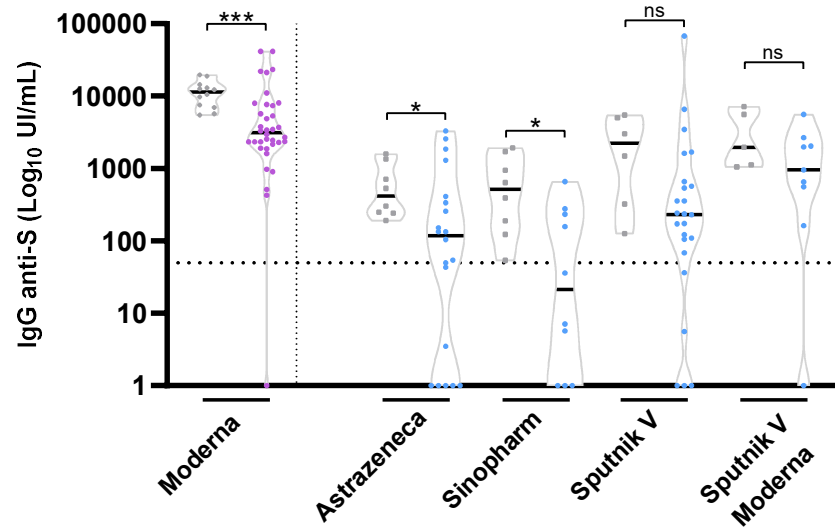
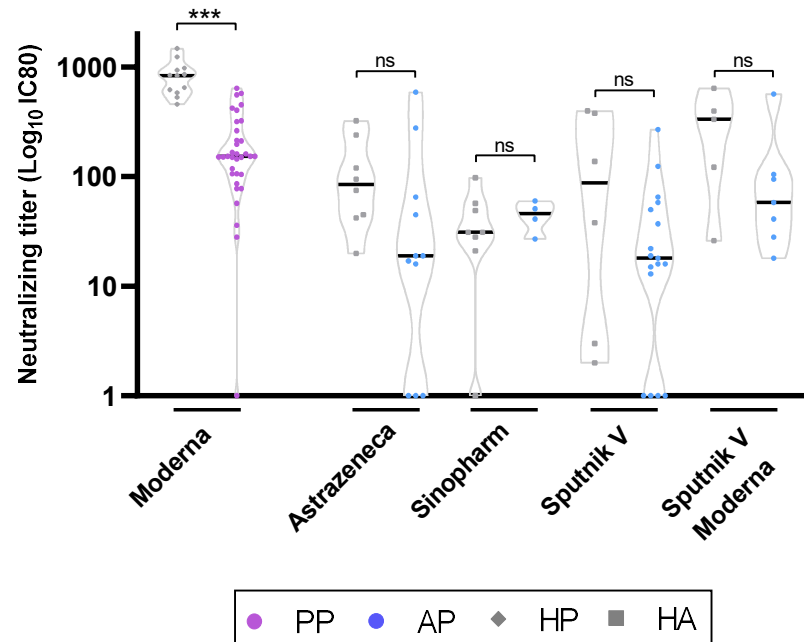
Longitudinal anti-S/RBD IgG levels in patients with or without history of COVID-19 infection. T0=before immunization, T2=28 days (+/- 3 days) after the second dose.

Fill circles represent patients without SARS-CoV-2 infection (no history of SARS-CoV-2 or no seroconversion anti-N antibodies after vaccination). Open circles represent the analysis of patients with SARS-CoV-2 infection (symptomatic (qPCR positive for SARS-CoV-2) and/or seroconverted (positive prior to vaccination anti-S/RBD antibodies and/or positive for anti-N antibodies after vaccination)).

Dotted line is the antibody threshold at 50 UI/ml in anti-Spike/RBD antibody titers graphs. Statistical analysis was performed using Kruskal-Wallis test. *P<0.05,

P<0.01, *P<0.001, ****P<0.0001.

FIGURE S4

a**b**

Humoral response of IEI patients and HC, segregated by vaccine type, after fully immunization at T2. **a.** Anti-S/RBD IgG levels for the different vaccines in PP, AP, HP and HA at T2. **b.** Neutralizing titer levels for the different vaccines in PP, AP, HP and HA at T2. IC₈₀= eighty inhibitory concentration corresponding to the serum

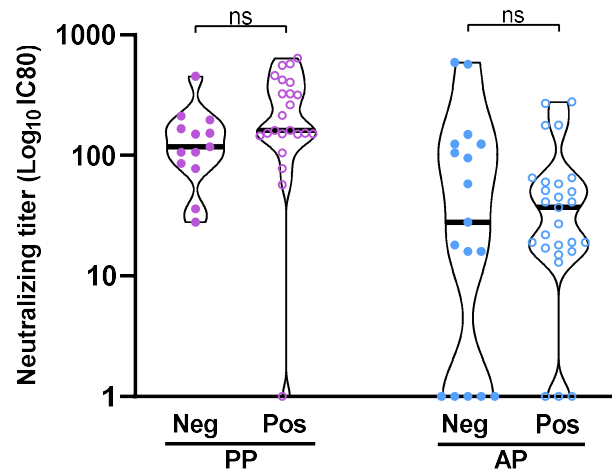
antibody dilution causing a 80% reduction of GFP positive cells compared to control virus only treated cells.

Dotted line is the antibody threshold at 50 UI/ml in anti-Spike/RBD antibody titers graphs. Statistical analysis was performed using Mann–Whitney test.

Samples included: Moderna (HP:12, PP:34), AstraZeneca (HA:8, AP:11), Sinopharm (HA:8, AP:4), Sputnik V (HA:6, AP:17), Sputnik V/Moderna (HA:5, AP:7).

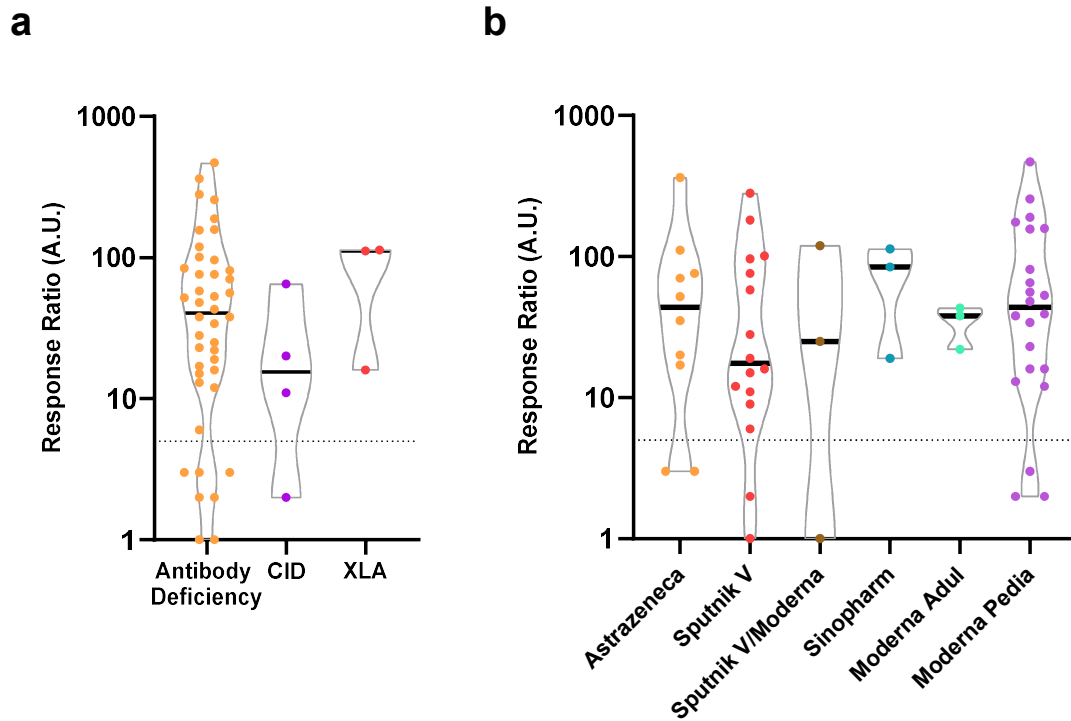
*P<0.05, **P<0.01, ***P<0.001, ****P<0.0001.

FIGURE S5



Neutralization titer at T2 in IEI patients with or without history of COVID-19. Neg = patients without COVID-19 symptoms reported, negative for anti-S/RBD antibody at baseline and negative for anti-N antibody at T2. Pos = patients symptomatic, qPCR positive for SARS-CoV-2 and seroconverted (positive prior to vaccination anti-S/RBD antibodies and/or positive for anti-N antibodies after vaccination). Samples included: adult patients (AP: Pos:27, Neg:17, blue circles), pediatric patients (AP: Pos:23, Neg:13, purple circles) IC₈₀= eighty inhibitory concentration corresponding to the serum antibody dilution causing a 80% reduction of GFP positive cells compared to control virus only treated cells.

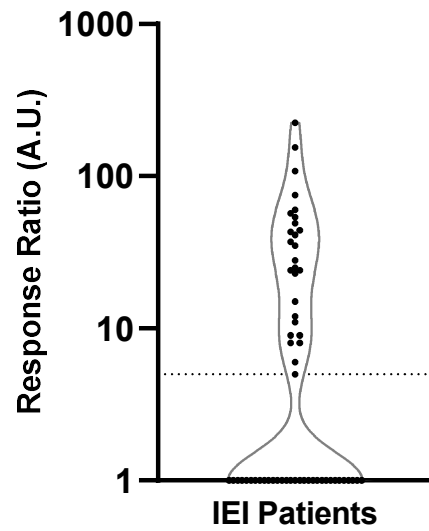
FIGURE S6



IFN-gamma production by T cells from IEI patients after the second dose of vaccination. **a.** Number of SFC relative to control of each IEI patient after stimulation with S protein at T2, stratified by diagnose. **b.** Number of SFC relative to control of each IEI patient after stimulation with S protein at T2, segregated by vaccine type. SFC=Spot forming cells, CID= combined immunodeficiency, XLA= X-linked agammaglobulinemia. A.U.= Arbitrary Units. Dotted line in 6 was set as threshold.

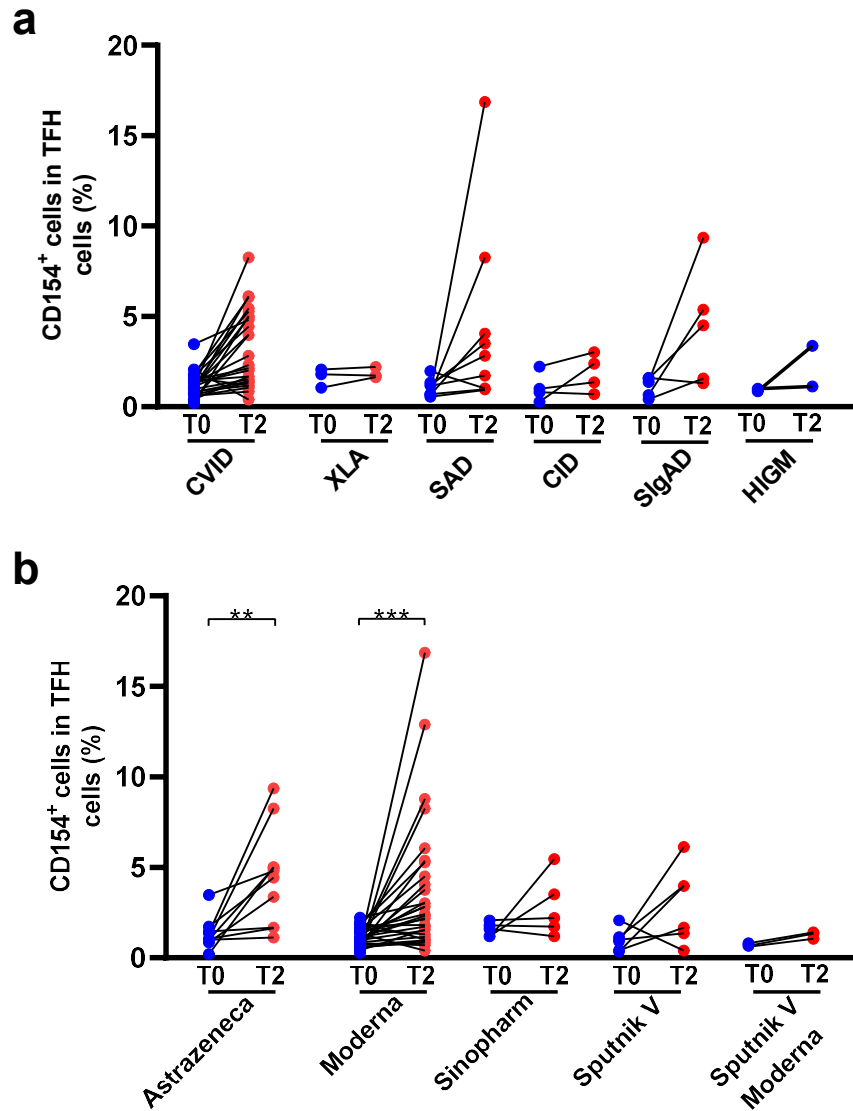
*P<0.05, **P<0.01, ***P<0.001, ****P<0.0001.

FIGURE S7



IFN-gamma production by T cells from IEI patients after the second dose of vaccination. Number of SFC per million PBMC relative to control of each IEI patient after stimulation with N protein at T2. SFC=Spot forming cells, A.U.= Arbitrary Units. Dotted line in 6 was set as threshold.

FIGURE S8



Circulating spike-specific TFH cells in IEI patients. The percentage of circulating spike-specific TFH-cells (CD4+CXCR5+PD1+CD154+) was determined after 24 h of S protein stimulation in T0 and T2 IEI samples. IEI patients were segregated by pathology **(a)** or vaccine type **(b)**. For each time point results are shown as the percentage of TFH spike-specific cells in the stimulated condition (S protein) relative to the unstimulated condition. Statistical analysis was performed by using Wilcoxon signed rank test. *P<0.05, **P<0.01, ***P<0.001, ****P<0.0001.