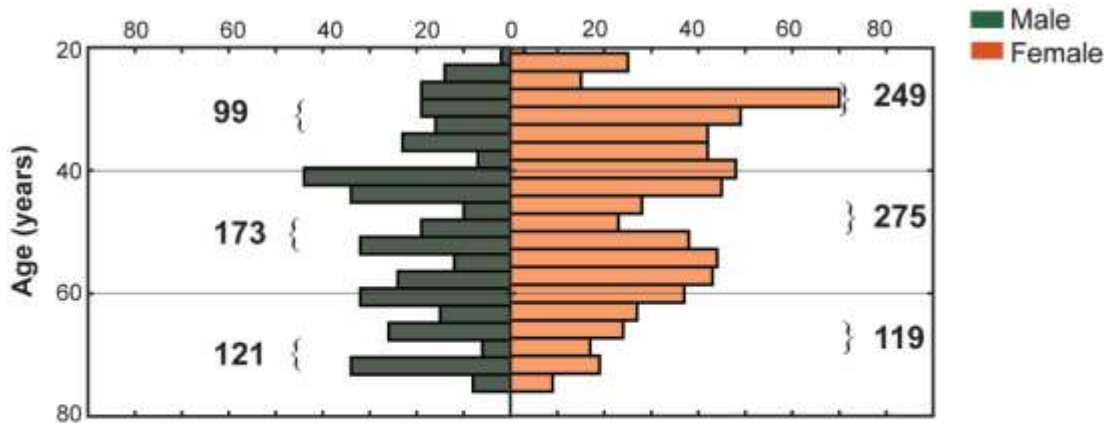


Supplemental information

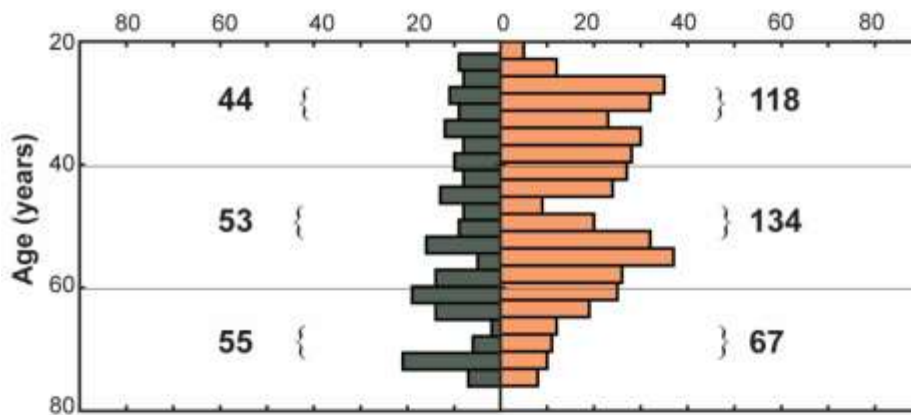
**Multivariate analyses and machine
learning link sex and age with antibody
responses to SARS-CoV-2 and vaccination**

Miroslava Cuperlovic-Culf, Steffany A.L. Bennett, Yannick Galipeau, Pauline S. McCluskie, Corey Arnold, Salman Bagheri, Curtis L. Cooper, Marc-André Langlois, Jörg H. Fritz, Ciriaco A. Piccirillo, and Angela M. Crawley

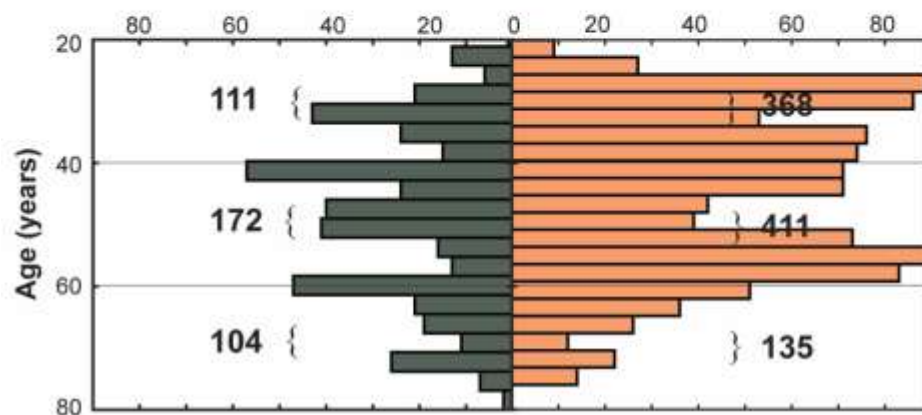
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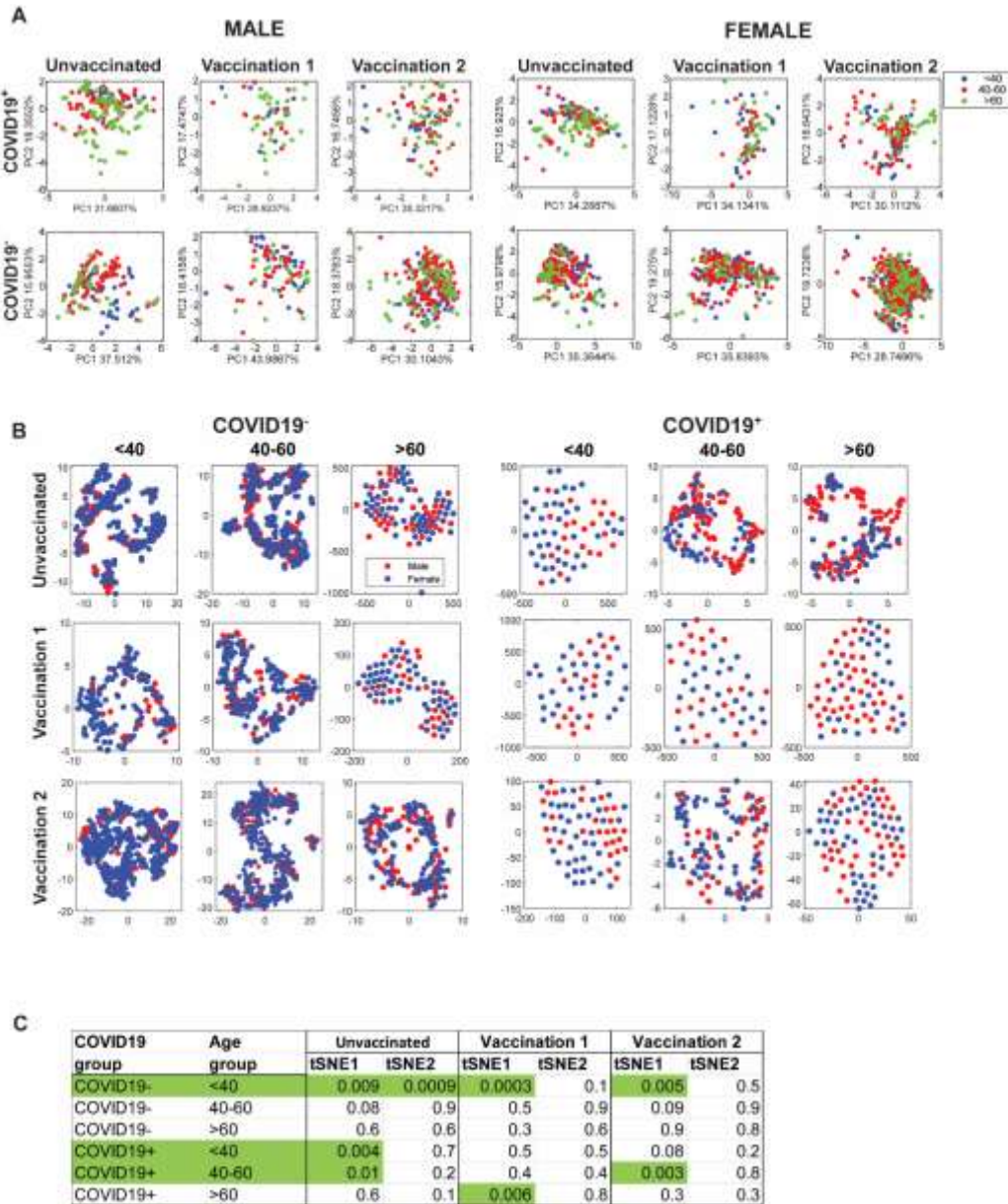
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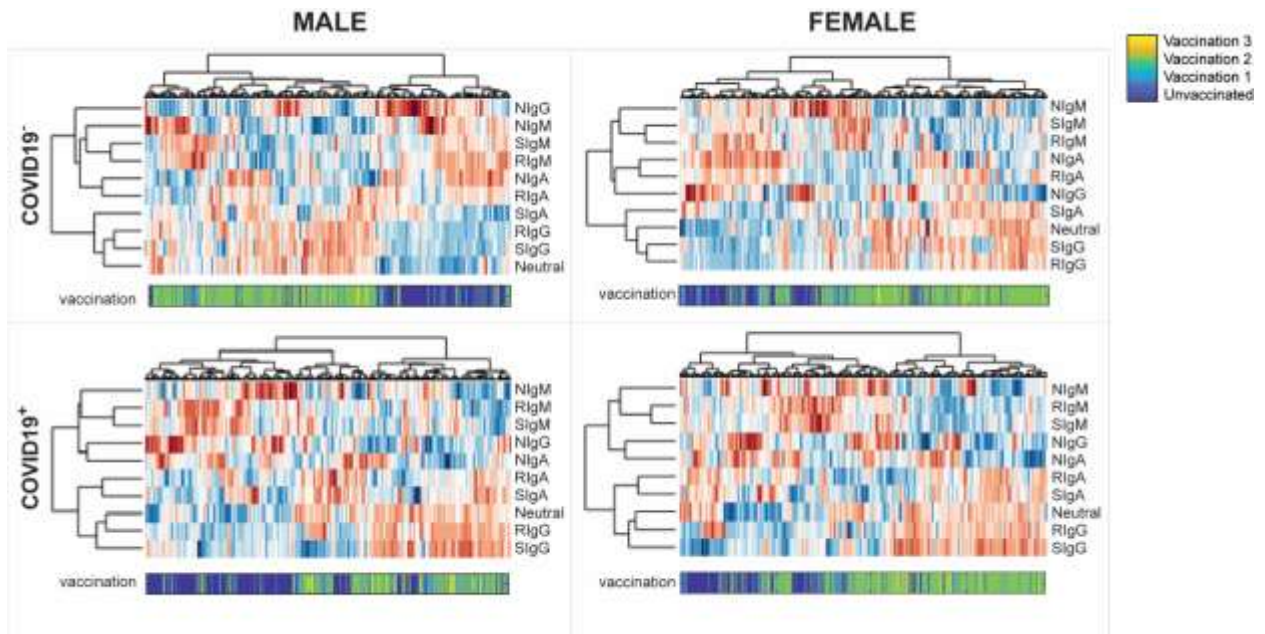
Dose2



Supplementary Figure 1. Age distribution of subjects' measurements prior to vaccination and following Dose 1 and 2. Related to Table 1 Indicated are total number of samples in three age groups used in the analysis. Age division is optimized for sufficient statistical representation while keeping with division into three groups: young (<40), mid-life (40-60) and senior (>60).



Supplementary Figure 2. Dominant effect of vaccination on serology profiles in all age groups, with profound separation between Unvaccinated and Vaccination 1 groups and some separation by sex in different subgroups. Related to Figure 1. A. Principal Component Analysis (PCA) for dataset of 9 different antibody response and relative neutralization measurements with samples separated by immunity status, sex and vaccination period. **B.** tSNE visualization of overall sample differences. Groups are separated by age and COVID19 status as well as vaccination period. **C.** Table shows p-values for *t*-test comparison of difference between males and females in each projection group. Indicated in green are statistically significant differences.



Supplementary Figure 3. Comparable clustering of antibody profiles pre- and post-vaccination identifies unique clustering of NlgG values in COVID-19 negative males with NlgM, SigM and RlgM in contrast to clusters with NlgA, RlgA and SigA in other groups. Related to Figure 3. Hierarchical clustering of subjects divided into groups by sex and COVID19 status using 9 different antibody response and relative neutralization measurements. A major dependence on vaccination period is indicated (legend indicates vaccination state: Unvaccinated prior to vaccination, Vaccination 1 after first dose and prior to dose 2 etc.). Presented is a relative value heat map with blue showing lower and red showing and higher than mean values.