Results of Studies Evaluating the Impact of SARS-CoV-2 Variants of Concern on COVID-19 Vaccines: An Ongoing Systematic Review

Neutralization Plots

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Methods for Inclusion in Neutralization Plots

The studies included in the plots below were identified as part of an ongoing systematic review of studies evaluating the impact of SARS-CoV-2 variants of concern on COVID-19 vaccine performance. Studies from March 15, 2021 onward that report fold reductions in neutralization or that report data that enable the calculation of fold reductions in neutralization are included.

The following studies are not included:

- Studies evaluating partial vaccination
- Studies that collected vaccinee sera < 7 days or > 6 months post final vaccine dose
- Studies that used a variant of concern (e.g. Alpha, Delta) as the reference strain
- Studies of immunocompromised persons
- Studies including samples from persons with hybrid immunity
- Studies using surrogate neutralization assays
- Studies that combine vaccines (with the exception of mRNA vaccines for all VOCs other than Omicron)
- Studies that ND80 results instead of ND50

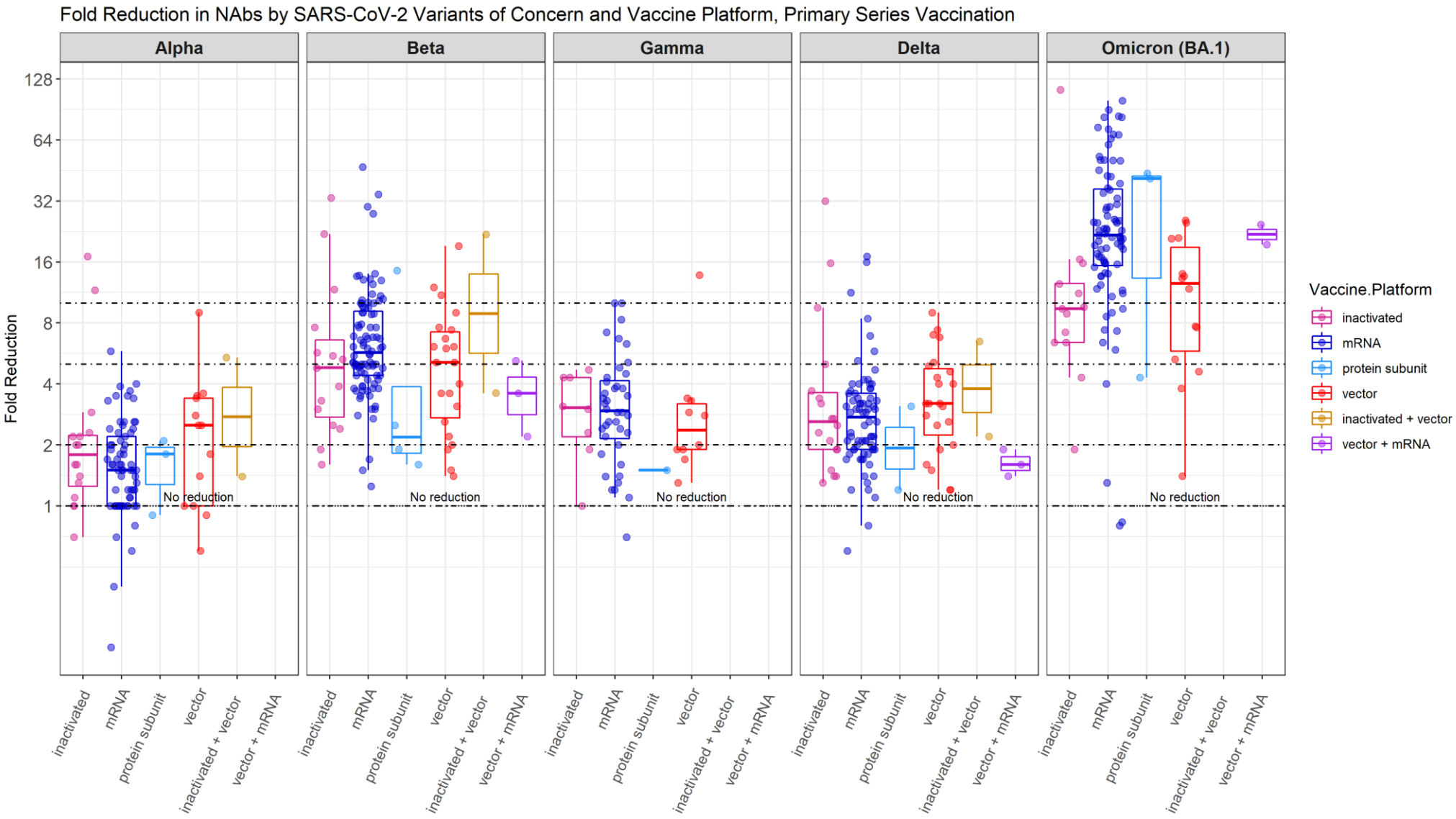
Because Omicron exhibits substantial immune escape, often the percentage of samples with detectable neutralizing antibodies is low after primary series vaccination. As a result, fold reductions for Omicron can be artificial. Thus, in addition to plots showing the fold reductions in neutralizing antibodies relative to the ancestral strain, plots showing the percentage of samples with detectable antibody levels are included for Omicron sub-lineages

In the plots, the boxes represent IQR, with median represented by a bar within the box. The lines extending from the boxes represent the range of observations excluding outliers.

The WHO COVID-19 Weekly Epidemiological Update is posted weekly on the WHO website (https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports). A summary of results from these studies by vaccine and by variant of concern are provided in the WEU every other week.

For any questions, comments, or suggestions about this document, please contact Melissa Higdon: mhigdon@jhu.edu.

Primary Series Vaccination, All Variants of Concern



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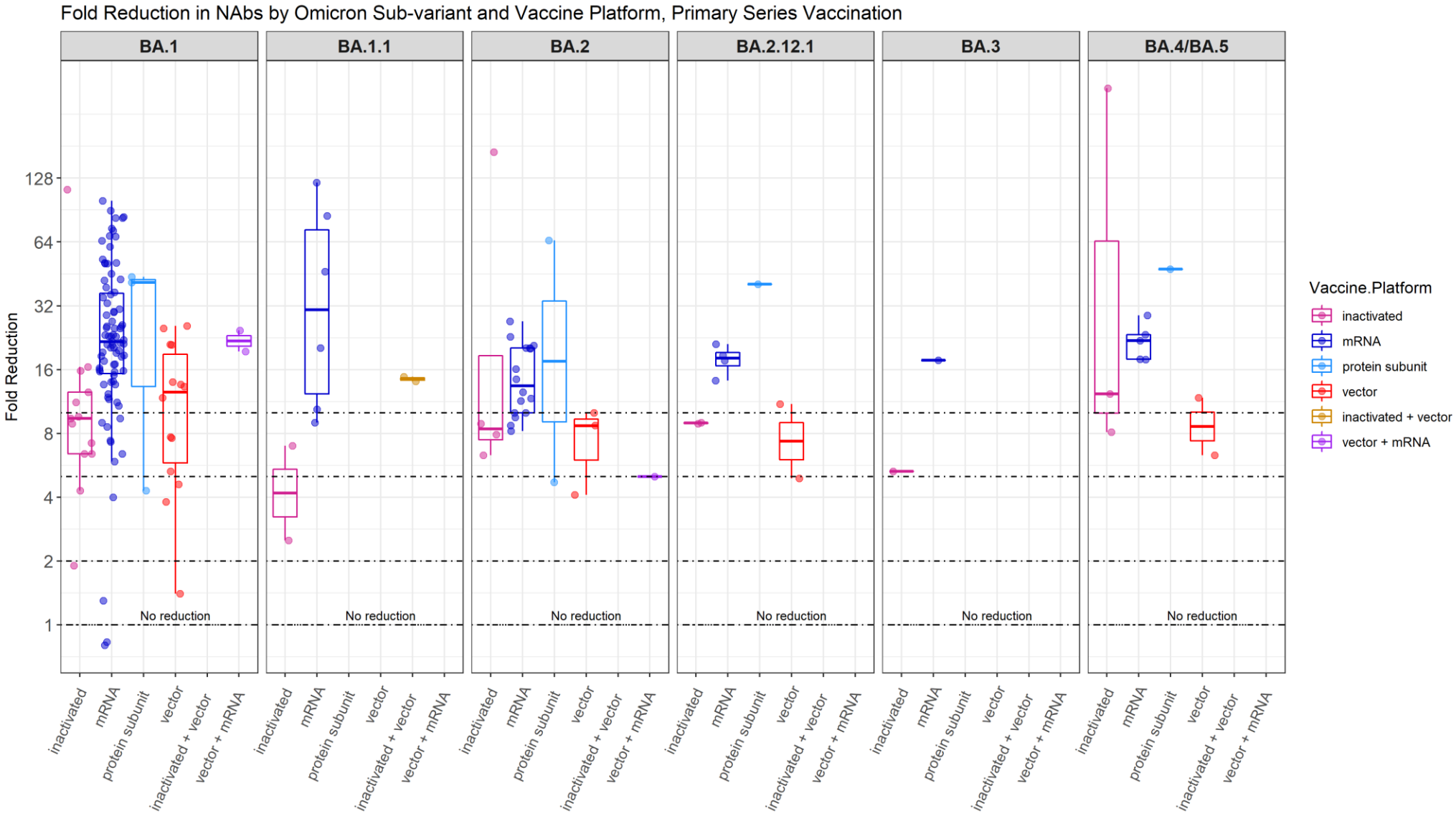
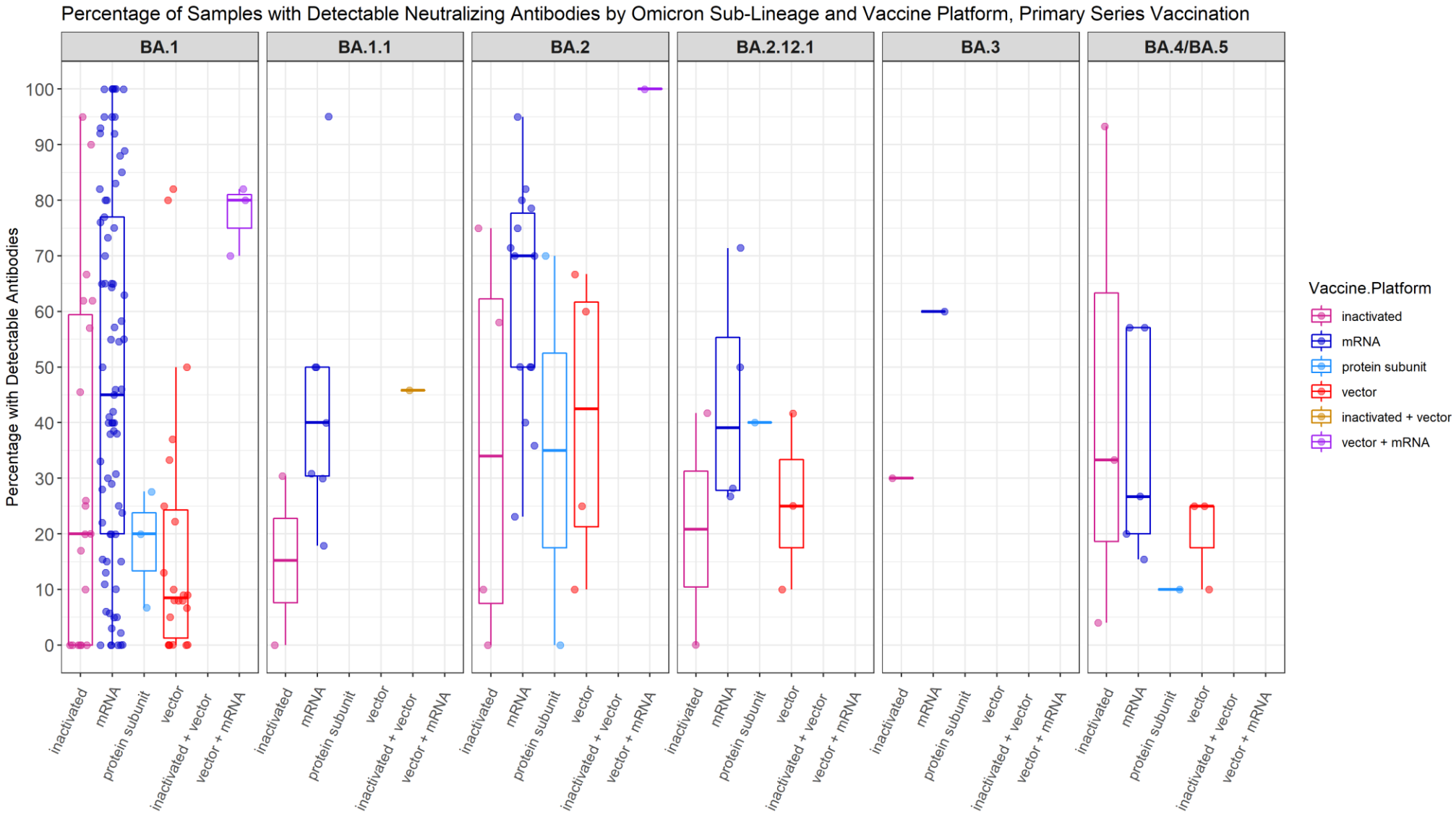
Primary Series Vaccination, Omicron Subvariants





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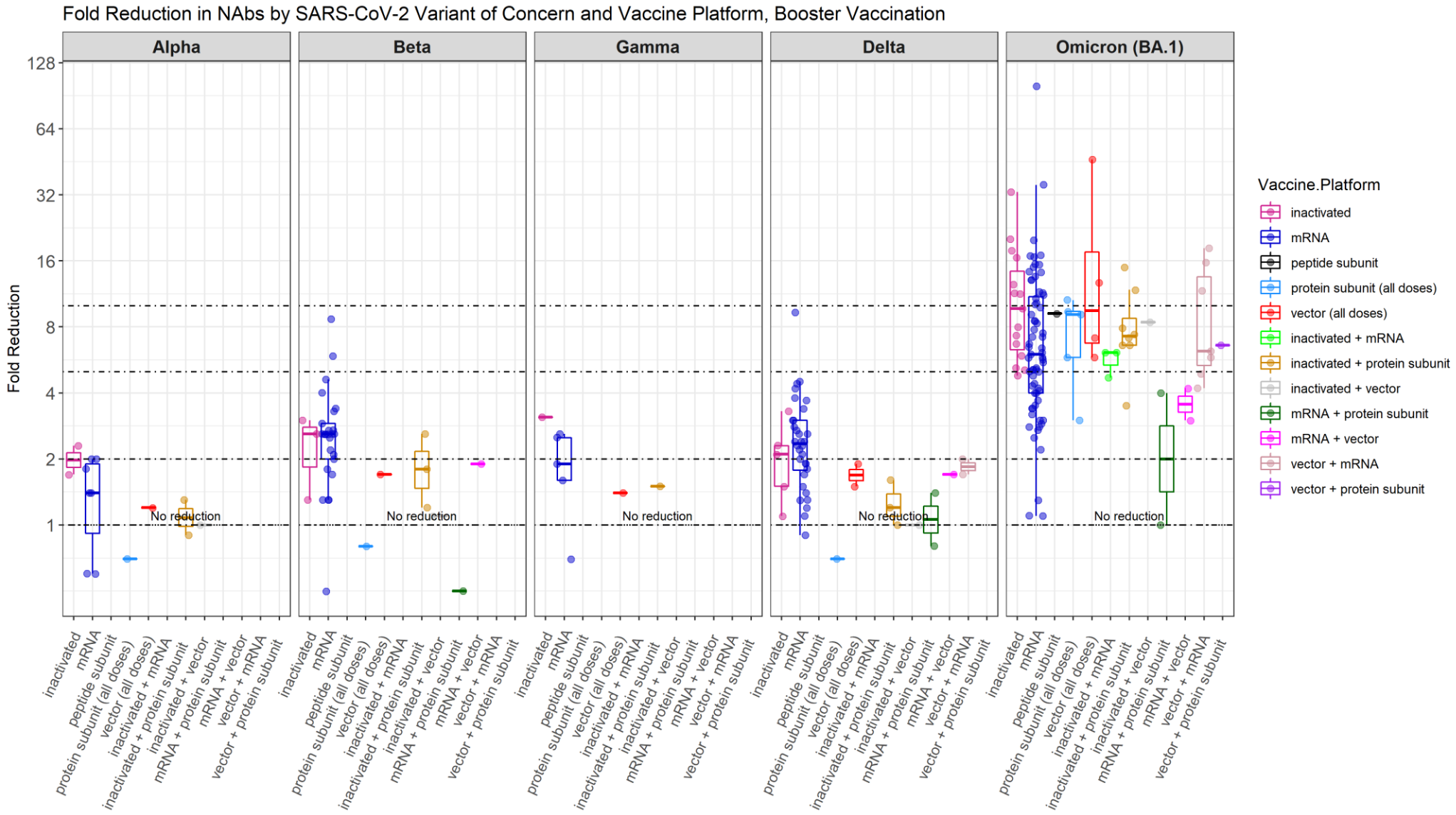
Booster Vaccination, All Variants of Concern



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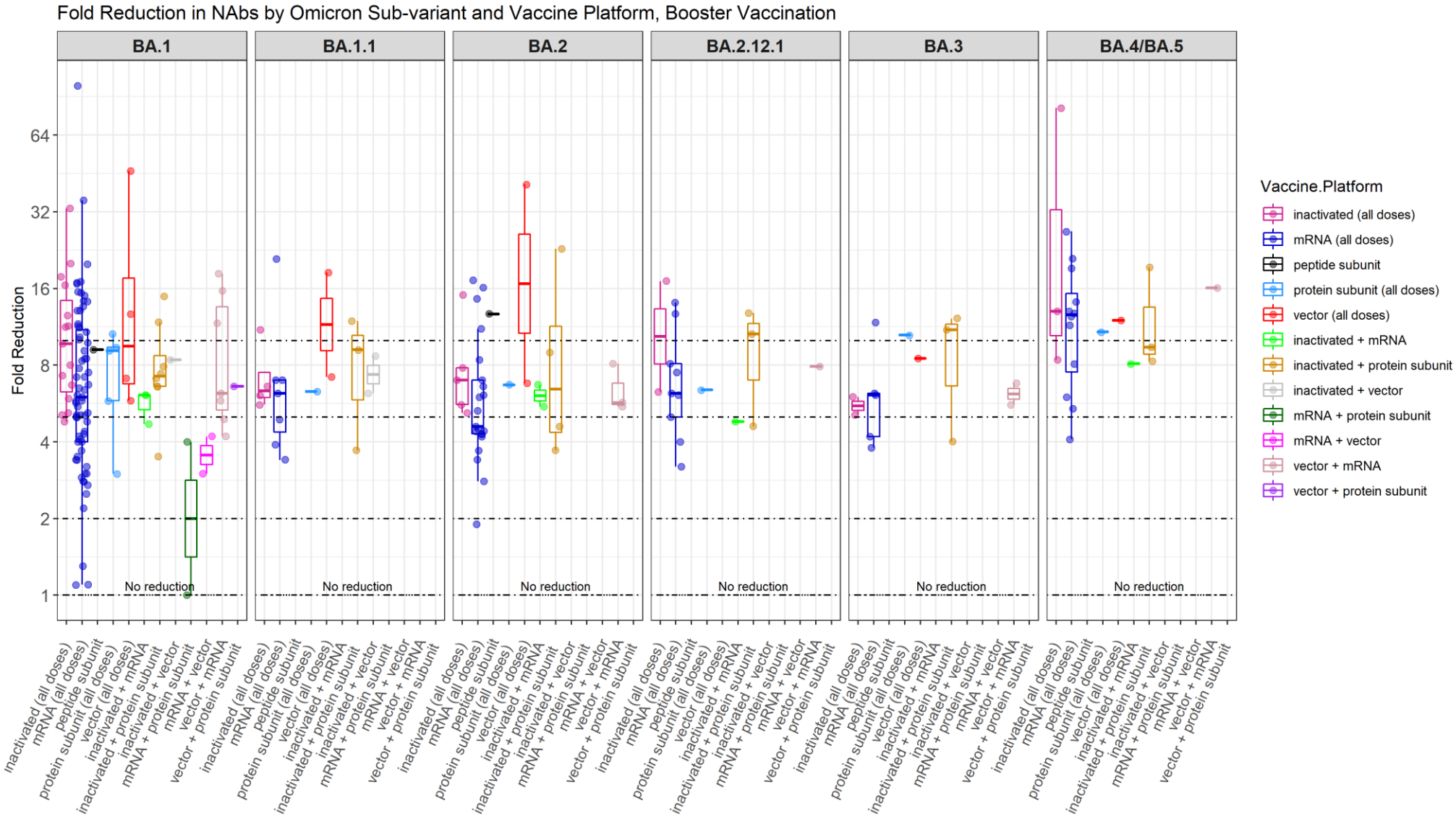
Booster Vaccination, Omicron Subvariants



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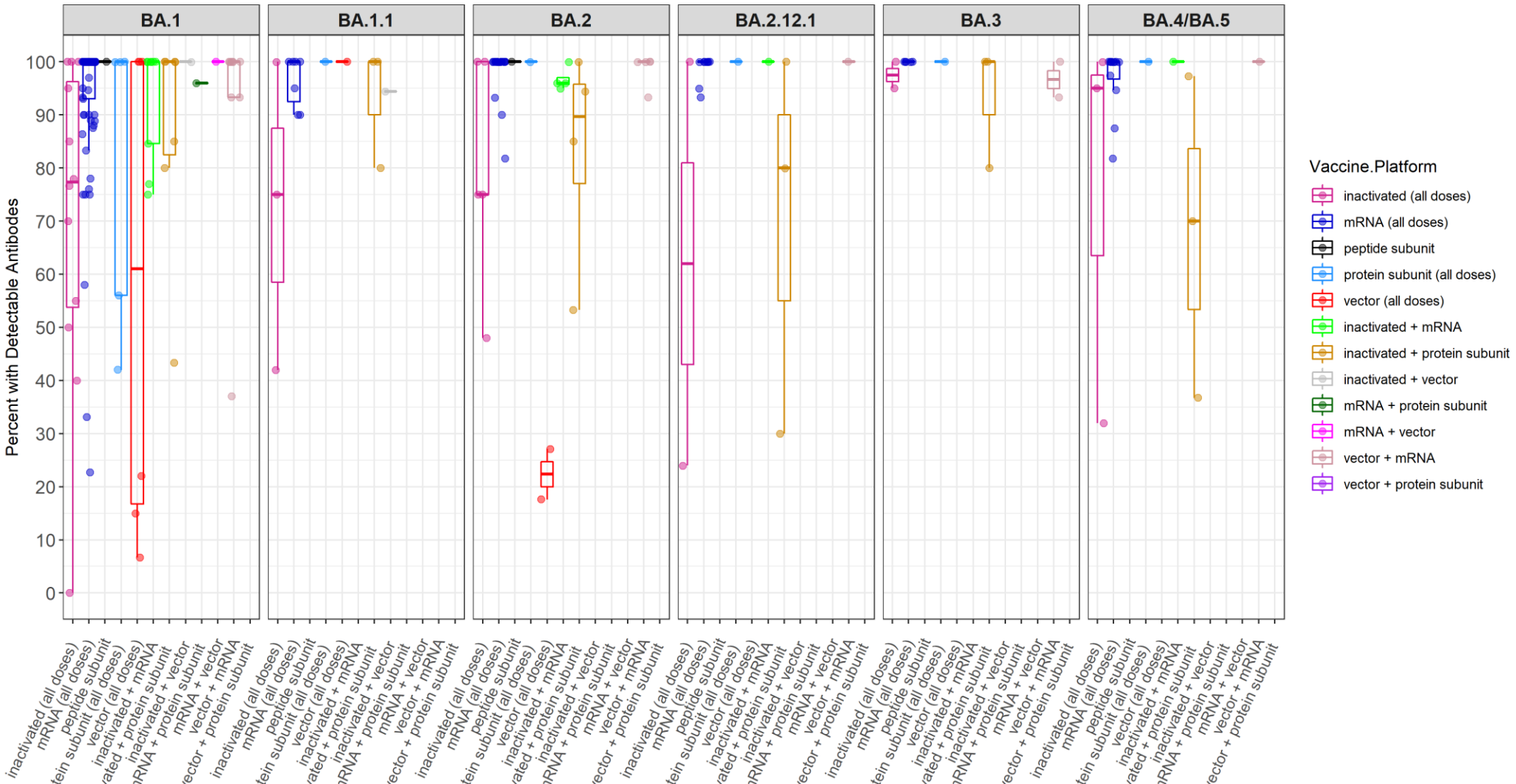
Percentage of Samples with Detectable Neutralizing Antibodies by Omicron Sub-Lineage and Vaccine Platform, Booster Vaccination



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