Safety and Immunological Response following Heterologous Booster COVID-19 Vaccination (3rd dose booster): The preliminary report focusing on the delta variant

Nasikarn Angkasekwinai[1], Jaturong Sewatanon[1], Sansnee Senawong[1], Kovit Pattanapanyasat[1], Suvimol Niyomnaitham[1], Supakit Sirilak[2], Ballang Uppapong[2], Supaporn Phumiamorn[2], Sompong Sapsutthipas[2], Sakalin Trisiriwanich[2], Thitiporn Somporn[2], Kornnika Kullabutr[2], Asmah Usoo[2], Supaporn Chumpol[2], Kanokphon Ritthitham[2], Natthakarn Mingngamsup[2], Onanong Potha[2], Wipawee Wongchana[2], and Kulkanya Chokephaibulkit[1]

[1]Faculty of Medicine Siriraj Hospital, Mahidol University and [2]Department of Medical Sciences, Ministry of Public Health

SiCRES
Siriraj Institute of Clinical Research

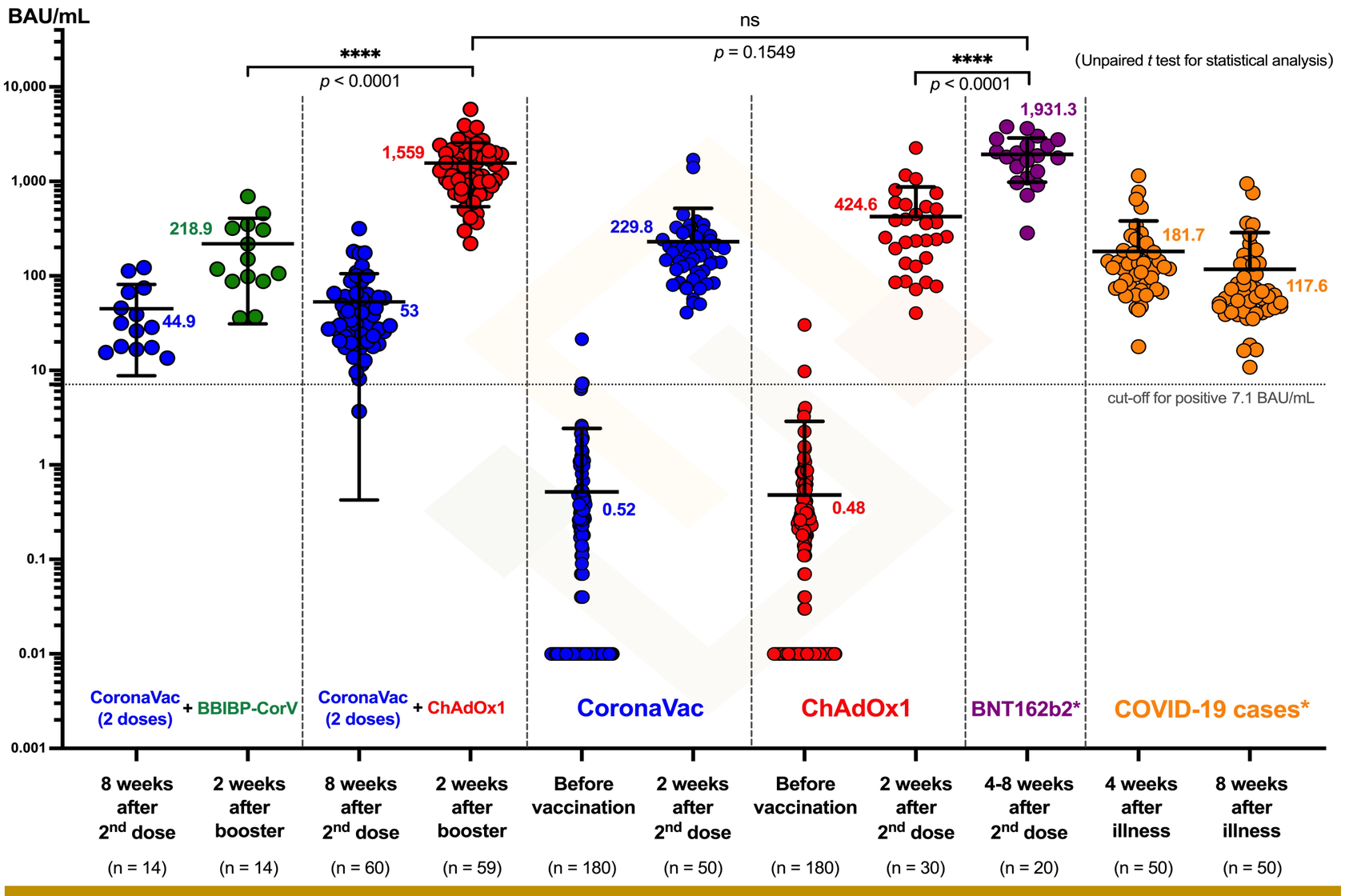

Figure 1. Anti-RBD IgG antibody against SAR-CoV-2 by CMIA

Rationale: The inactivated COVID-19 vaccine manufactured by Sinovac (CoronaVac) has been widely used in Thailand. The emergence of delta variant that escapes the immunity following post-infection or post-vaccination, resulted in reduced the vaccine efficacy, particularly for inactivated vaccine. From August 2021, a third dose booster has been recommended in frontline healthcare workers in Thailand who received 2 doses of CoronaVac. We investigated the immunogenicity induced by a heterologous or homologous platform of vaccine as booster against the delta variant.

Method: This prospective study conducted in healthcare workers who received 2 doses of CoronaVac or ChAdOx1 8-10 weeks earlier. They were assigned to receive a booster dose of either BBIBP CorV or ChAdOx1 or a full dose or a half dose of BNT162b2 mRNA vaccine. Adverse events were self-reported for 7 days post-vaccination. Anti-receptor binding domain (RBD) IgG antibody titers were measured by chemiluminescent microparticle immunoassay (CMIA; Abbott Laboratories, Ltd.) on the day of the the booster vaccination, day 14, and day 90 after the vaccination. A portion of participants from each group were randomly selected to test for 50% plaque reduction neutralization antibody assay against SARS-CoV-2 delta strain live virus (PRNT50).

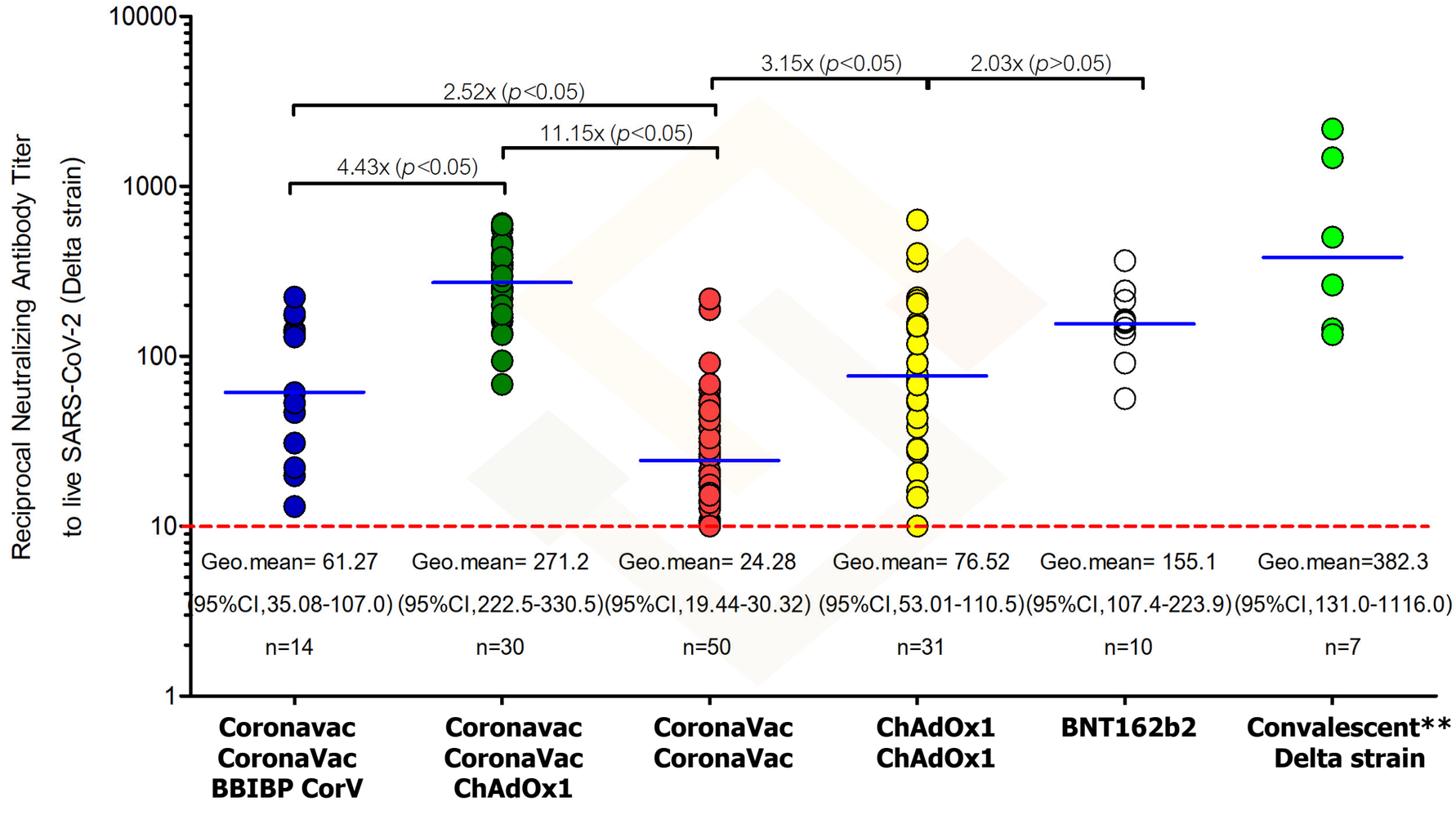

Figure 2. 50% plaque reduction neutralization against delta variant

Results: This is the preliminary report of those primed with 2 doses of CoronaVac and boosted with either BBIBP or ChAdOx1. The anti-RBD-IgG (Fig 1) and $PRNT_{50}$ (Fig 2) revealed that ChAdOx1 induced significantly higher antibody level than BBIBP. The anti-RBD IgG following the ChAdOx1 boost was insignificantly lower than following 2-dose of BNT162b2; however, the $PRNT_{50}$ against delta variant was 1.7 times higher, and close to titers of convalescent sera who recovered from delta variant infection. The adverse events reported were mild to moderate, no serious adverse event reported.

***Acknowledgement**: This study was supported by the National Research Council of Thailand and Abbott Laboratories, Ltd.*