Table 1. Summary of efficacy and safety of SARS-CoV-2 vaccines

	Vaccine 1 Sinovac[1-3]	**Vaccine 2 Moderna[4]**	**Vaccine 3 Pfizer[5]**	**Vaccine 4 Astra/Oxford[6]**
Reviewers	RI, GF, TA	AT, TS, PS, AI	SS, PJ, KT	CC, SO, PW
Vaccine	CoronaVac	mRNA-1273	BNT162b2 mRNA Covid-19	ChAdOx1 nCoV-19
Technique	Inactivated virus	mRNA	mRNA	Viral vector
Dosage	2 doses, 14 days apart	2 doses, 28 days apart	2 doses, 21 days apart	2 doses, 4-12 weeks apart
Cost per dose	15-30 USD	32-37 USD	18.30-19.50 USD	2-5 USD
Storage/Logistic	2 to 8 °C up to 3 years	*Short term storage:* 2 to 8 °C up to 30 days Room temperature 8 hours before administration *Long term storage:* -25 to -15 °C	*Short term storage:* After thawed: 2 to 8 °C up to 5 days (undiluted) up to 6 hours (diluted) *Long term storage:* -80 to -60 °C up to 10 days	2 to 8 °C up to 6 months
Phase I, II results (Immunogenicity)	Seroconversion of neutralizing antibodies at day 28 3 mcg: 92% 6 mcg: 98%	For 100 mcg Anti-S-2P geometric mean titer: 782,719 (619,310-989,244) (day 57) Systemic AEs: - overall: fever, fatigue, or chills 100%	For 30 mcg S1-Binding IgG: geometric mean titer (U/ml): - 18-55 years: 9,136 (day 28), 8147 (day 35) - 65-85 years: 7,985 (day 28), 6014 (day 35) Systemic AEs: - fever: 8-17% - fatigue: 42-75% - chills: 17-58%	>99% of 209 boosted participants had neutralizing antibody responses after 14d No serious adverse events
Phase III trials				
Baseline characteristics of participants in phase III trials				
Countries and COVID-19 prevalence	***UNOFFICIAL RESULTS** Brazil 3.9% Chile 3.4% China 0.007% Indonesia 0.32% Turkey 2.8%	USA 7.3%	USA 7.3% Argentina 3.9% Brazil 3.9% Turkey 2.8% Germany 2.4% South Africa 2.2% (Pooled prevalence: 6.4%)	UK 4.8% Brazil 3.9%

Total sample size	31,020	30,420	43,548	11,636 for Efficacy 23,784 for Safety
Age, year, median (Range)	18-60+	51.4 (18-95) ≥65 years: 24.8%	52 (16-91) >55 years: 42.2%	18-55 >55 years: 3.8%
Ethnicity	-	White 79.2%, Black 10.2%, Asian 4.6%	White 82.9%, Black 9.4%, Asian 4.3%	White 82.7%, Black 4.1%, Asian 4.4%,
Comorbidities data	-	- Chronic lung disease: 4.8% - Cardiac disease: 4.9% - Severe obesity: 6.7% - Diabetes: 9.5%	- Chronic lung disease: 7.8% - Cardiac disease: 0.5-1% - Obesity: 35.1% - Diabetes: 7.8%	- Respiratory disease: 10-13% - Cardiac disease: 7-12% - Diabetes: 1-3%
Healthcare workers	86.2%	25.4%	(Not reported)	79.7%
Pregnancy	0%	0%	0%	0%
Children	0%	0%	(100 children aged 12-15 years were accidentally enrolled)	0%
Median follow-up	1 yr (Protocol)	2 months after the 2nd dose	2 months after the 2nd dose	2 months after the 2nd dose
Comparator	Placebo	Saline	Saline	Meningococcal vaccine/Saline

	Vaccine 1 Sinovac	**Vaccine 2 Moderna**	**Vaccine 3 Pfizer**	**Vaccine 4 Astra/Oxford**
Validity of phase III trials				
Appraisal using User's Guide	No data	Randomized: Yes Concealment: Yes **Analysis: Per protocol** ***Modified intention-to-treat** Balanced baseline: Yes Blinding: Patients, clinicians and assessors **Follow-up complete: Ongoing** ***Excluded 4.15% and 3.77% in vaccine and placebo groups** **Interim analysis**	Randomized: Yes Concealment: Yes **Analysis: Per protocol** **Modified intention-to-treat** Balanced baseline: Yes Blinding: Patients, clinicians and assessors **Follow-up complete: Yes** **But 16.1% not assessed for COVID-19 infection ≥ 7 days after second dose**	Randomized: Yes Concealment: Yes **Analysis: Per protocol** **Modified intention-to-treat** Balanced baseline: Yes Blinding: Patients **Follow-up complete:On going** **Protocol violation: half dose** **Interim analysis: n=11,636/23,848**
GRADE level of evidence	(No data)	1B (RCT with important limitations)	1B (RCTwith important limitations)	1B (RCT with important limitations)

	Vaccine 1 Sinovac	**Vaccine 2 Moderna**	**Vaccine 3 Pfizer**	**Vaccine 4 Astra/Oxford**
Result of phase III trials				
Outcome assessment	Symptom diary, periodic nasal swab/serology	Electronic symptom diary	Electronic symptom diary	Periodic nasal swab and phone calls
Efficacies in asymptomatic COVID infection	Unofficial report from Brazil, Indonesia, Turkey: Vaccine group: 1.24 - 1.83% Placebo group: 3.48 - 3.63% **Efficacy: 49.6% - 64.2%** **NNT: 41 – 56** **18-24/1,000 vaccinated patients**	No information	No information	Vaccine group: 0.9% Placebo group: 1.2% **Efficacy: 27.3%** **NNT: 334** **3/1,000 vaccinated patients** Subgroup LD/SD Vaccine group: 0.6% Placebo group: 1.5% **Efficacy: 58.9%** **NNT: 112** **9/1,000 vaccinated patients** Subgroup SD/SD Vaccine group: 1% Placebo group: 1% **Efficacy: 3.8%** **NNT: 0** **0/1,000 vaccinated patients**
Efficacies in symptomatic COVID infection	Unofficial report from Brazil, Indonesia, Turkey: Vaccine group: 0.2% Placebo group: 1.2% **Efficacy 78.2%** **NNT 102** **10/1,000 vaccinated patients**	**Per protocol:** Vaccine group: 0.08% Placebo group: 1.31% **Efficacy 94.1%** **NNT 84** **12/1,000 vaccinated patients** **modified ITT** Vaccine group: 0.13% Placebo group: 1.84% **Efficacy 93.0%** **NNT 59** **17/1,000 vaccinated patients**	**Per protocol:** Vaccine group: 0.04% Placebo group: 0.88% **Efficacy 95.0%** **NNT 120** **8/1,000 vaccinated patients** **modified ITT** Vaccine group: 0.23% Placebo group: 1.27% **Efficacy 81.8%** **NNT 97** **10/1,000 vaccinated patients**	Vaccine group: 0.5% Placebo group: 1.7% **Efficacy 70.4%** **NNT 84** **12/1,000 vaccinated patients** Subgroup LD/SD Vaccine group: 0.2% Placebo group: 2.2% **Efficacy 90.0%** **NNT 50** **20/1,000 vaccinated patients**

				Subgroup SD/SD Vaccine group: 0.6% Control group: 1.6% **Efficacy 62.1%** **NNT 100** **10/1,000 vaccinated patients**
Efficacies in moderate to severe COVID disease:				
1. Hospital admission rate 2. Patients requiring oxygen therapy rate 3. ICU admission rate 4. Mortality rate	1. Efficacy 100% Vaccine = 0/6215 = 0.00% Placebo = 13/5979 = 0.21%	1. Efficacy 100% Vaccine = 0/13934 = 0.00% Placebo = 9/13883 = 0.06% 2. Efficacy 100% Vaccine = 0/13934 = 0.00% Placebo = 28/13883 = 0.02% 3. No information 4. Efficacy 15% Vaccine 6/15184 = 0.039 % Placebo 7/15165 = 0.046 %	Composite of 3/4 Efficacy 74.7% Vaccine group: 1/19,965 (0.005%) Placebo group: 4/20,172 (0.02%) No COVID-19-associated deaths were observed	1. Efficacy 80% Vaccine group: 2/12,021 Control group: 10/11,724 2. Efficacy 100% Vaccine group: 0/12,021 Control group: 10/11,724 3. Efficacy 100% Vaccine group: 0/12,021 (0) Control group: 2/11,724 (.02%) 4. Efficacy 100% Vaccine group: 0/12,021 Control group: 1/11,724 (.009%)
Efficacy in sub-population	Pregnant: Not included Children: Not included Elderly: No result	Pregnant: Not included Children: Not included Age: ≥ 65 y: 86.4% (61.4-95.2)	Pregnant: Not included Children: Not included by some accidental enrollment Age: ≥ 65 y: 94.7% (66.7, 99.9) ≥ 75 y: 100% (-13.1, 100.0)	(No result)
Vaccine-related adverse events (AE)	Brazil Both arm (n=7913) 1st dose 6803 (87.9%) 2nd dose 2722 (63.1%)	**Solicited AEs:** Mainly pain. Vaccine vs placebo 1st dose: 84.2% vs 19.8% 2nddose 88.6% vs 18.8%	**Solicited AEs** Injected site reactions (84.1%), fatigue (62.9%), headache (55.1%), muscle pain (38.3%), chills (31.9%), joint pain (23.6%), fever (14.2%). **Serious adverse events:** <0.5%.	

	Indonesia Vaccine arm (n=405) 1st dose: 245 (60.5%) 2nd dose: 206 (51.9%) Turkey Systemic AE in vaccine arm 1st dose: 373 (of 603; 61.9%) 2nd dose: 180 (of 1221; 14.7%)	**Systemic AEs** 1st dose 54.9% vs 42.4% 2nd dose 79.4% vs 36.5% Most common: fatigue, headache, myalgia, arthralgia, chills, nausea/vomiting, and fever. Commonly occurred in younger than older participants Unsolicited adverse events Overall, 23.9% vs 21.6%	Vaccine group: Shoulder injury related to Vaccine administration, Right axillary lymphadenopathy, Paroxysmal ventricular arrhythmia, and Right leg paresthesia No deaths	**Serious adverse events** Vaccine group: 79/12021 (0.65%) Control group: 89/11724 (0.76%) (ARR -0.001) **Transverse myelitis:** one possible related to vaccine
Summary	Vaccine efficacy and safety have been reviewed indicating Moderna achieved highest efficacy in symptomatic subjects, follow by Pfizer; Sinovac, and Astra/Oxford with the relative risk reductions of 93%-94%, 81.8%-95%, 78.2%, and 70.4%, respectively. If we vaccinate 1000 people with Moderna, Pfizer, Sinovac, and Astra/Oxford, we will be able to protect Covid-19 infections of 12-17, 8-10, 10, and 12 subjects. Serious events (i.e., ICU admission and death) are very rare, i.e., 0% to 0.039% in all vaccines, and 0% to 0.046% in controls. These findings are based on Grade IB level of evidences.			

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