

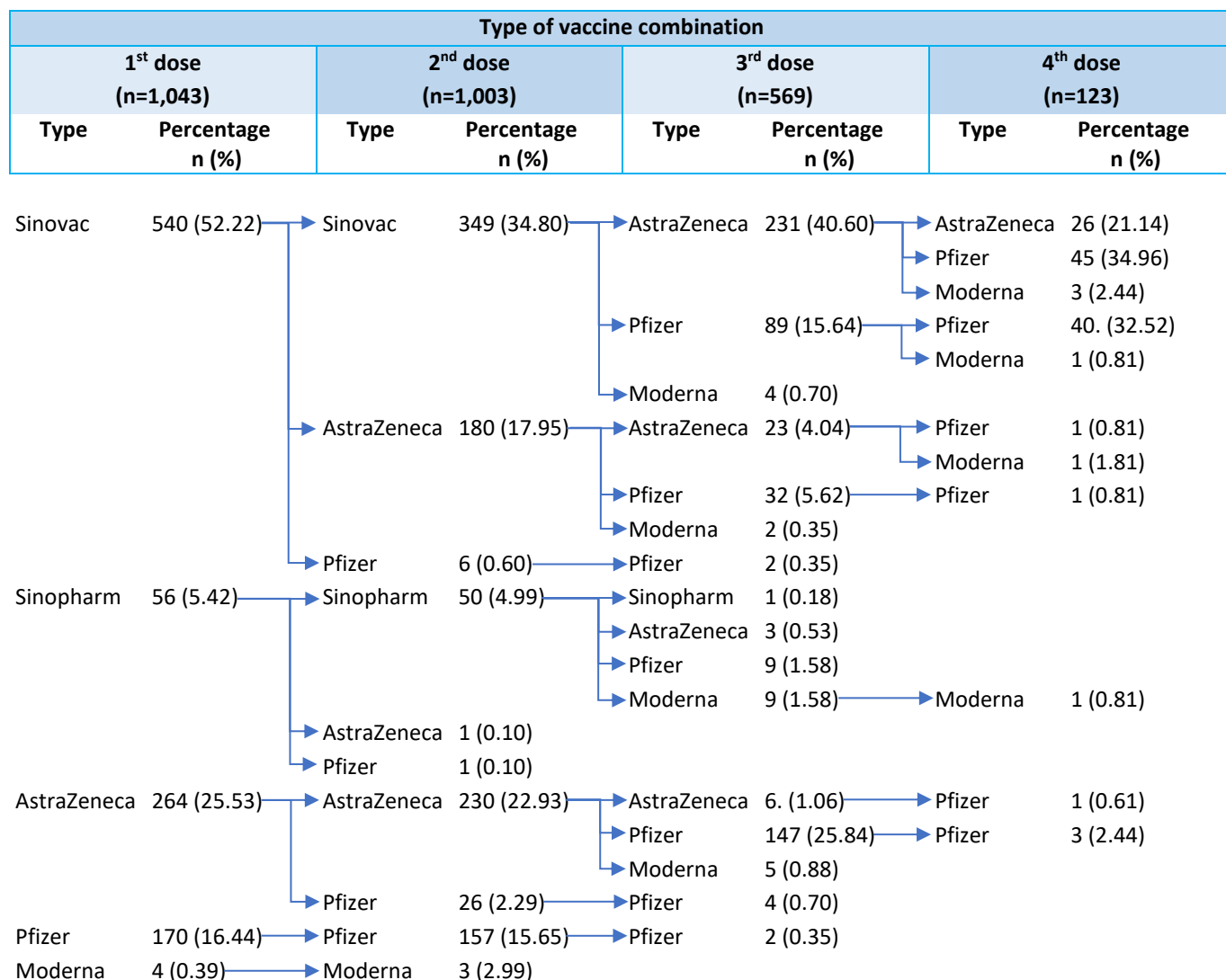
Supplementary table 1. Characteristics of persons from four cities in Thailand who tested positive for SARS-CoV-2 using the Wantai SARS-CoV-2 antibody ELISA for total Ig (n=5), December 2020 and January 2021

Case No	Age in years	Gender	Province	ELISA		Micro NT	CLI symptoms since 1 Feb 2020	Last reported symptom	Blood collection date
				Total Ig	IgM				
1	49	Female	Nakhon Phanom	Positive	Negative	<10	Headache	1 Dec 2020	24 Jan 2021
2	30	Male	Phuket	Positive	Positive	<10	None	NA	28 Jan 2021
3	60	Female	Chiang Mai	Positive	Negative	<10	Fever, headache, muscle pain, runny nose, difficulty breathing, stomachache and diarrhea	1 Jan 2021	31 Jan 2021
4	53	Female	Chiang Mai	Positive	Negative	<10	None	NA	31 Jan 2021
5	58	Female	Chiang Mai	Positive	Negative	<10	Headache, fatigue, and muscle pain	1 Jan 2021	-

ELISA: enzyme-linked immunosorbent assay. MicroNT: microneutralization assay. CLI: COVID-19-like illness. NA: not applicable.

Supplementary table 2. COVID-19-like illness (CLI) symptoms stratified by age group

Symptom n (%)	Total (n=278)		5–18 years (n=74)		19–59 years (n=167)		60 years and over (n=37)	
	CLI (n=278)	Positive CLI (n=50)	CLI (n=74)	Positive CLI (n=14)	CLI (n=167)	Positive CLI (n=23)	CLI (n=37)	Positive CLI (n=13)
Cough	157 (56.5)	30 (60.0)	44 (59.5)	8 (57.1)	87 (52.1)	14 (60.9)	26 (70.3)	8 (61.5)
Dyspnea	19 (6.8)	3 (6.0)	5 (6.8)	1 (7.1)	12 (7.2)	1 (4.4)	2 (5.4)	1 (7.7)
Fever	87 (31.3)	21 (42.0)	28 (37.8)	7 (50.0)	54 (32.3)	12 (52.2)	5 (13.5)	2 (15.4)
High fever	34 (12.2)	8 (16.0)	12 (16.2)	2 (14.3)	21 (12.6)	6 (26.1)	1 (2.7)	0 (0.0)
Fatigue	27 (9.7)	6 (12.0)	1 (1.4)	1 (7.1)	25 (15.0)	5 (21.7)	1 (2.7)	0 (0.0)
Sore throat	159 (57.2)	31 (62.0)	38 (51.4)	11 (78.6)	101 (60.5)	14 (60.9)	20 (54.1)	6 (46.2)
Chill	3 (1.08)	1 (2.0)	0 (0.0)	0 (0.0)	3 (1.8)	1 (4.4)	0 (0.0)	0 (0.0)
Loss of smell	12 (4.3)	6 (12.0)	2 (2.7)	1 (7.1)	8 (4.8)	4 (17.4)	2 (5.4)	1 (7.7)
Diarrhea	10 (3.6)	3 (6.0)	1 (1.4)	0 (0.0)	6 (3.6)	1 (4.4)	3 (8.1)	2 (15.4)
Hospitalization	40 (14.4)	39 (78.0)	10 (13.5)	10 (71.4)	19 (11.4)	18 (78.3)	11 (29.7)	11 (84.6)



Main type of vaccine combination

Among 1st dose: Sinovac (50.49%), AstraZeneca (25.02%)

Among full primary series 2 doses: Sinovac-Sinovac (34.80%), Astra-Astra (22.93%)

Among 3rd booster: Sinovac-Sinovac-AstraZeneca (40.60%), AstraZeneca-AstraZeneca-Pfizer (25.84%)

Among 4th booster: Sinovac-Sinovac-AstraZeneca-Pfizer (34.96%), Sinovac-Sinovac-Pfizer-Pfizer (32.52%)

Supplementary figure 1. Vaccine combinations in study participants

Supplementary table 3. Duration from time of last dose COVID-19 vaccination or infection to time of 12-month blood draw among 34 vaccinated participants and 1 infected participant who had negative 1 year followed up Wantai ELISA IgG

Type	Number of participants (n=35)	Median time to 12-month blood draw (days) median (interquartile range)
COVID-19 infection (unvaccinated)	1	189 (0–0)
1 dose (uninfected)	17	16 (6–20)
2 doses (uninfected)	13	91 (83–109)
3 doses (uninfected)	4	110 (46–136)

ELISA: enzyme-linked immunosorbent assay

Supplementary table 4. Vaccine effectiveness against laboratory confirmed COVID-19-like illness (CLI), CLI with hospitalization, CLI with fever stratified by difference of vaccine combination (CLI and vaccination update 31 Jan 2022)

	Person-year	Positive PCR* n (rate/100 person-year)	Rate ratio [†] (95% CI)	VE (95% CI)	P-value
Total CLI					
Unvaccinated (reference group)	158.69	11 (6.93)	Reference	-	-
Sinovac-Sinovac-AstraZeneca	156.25	2 (1.28)	0.12 (0.02, 0.70)	88% (30, 98%)	0.019
Sinovac-Sinovac-Pfizer	48.85	1 (2.05)	0.17 (0.02, 1.80)	83% (-80, 98%)	0.142
AstraZeneca-AstraZeneca-Pfizer	146.87	3 (0.67)	0.06 (0.006, 0.60)	94% (40, 99.4%)	0.016
Hospitalized CLI					
Unvaccinated (reference group)	158.69	10 (6.30)	Reference	-	-
Sinovac-Sinovac-AstraZeneca	156.25	0 (0.00)	-0.06 (-0.10, -0.02) [‡]	-	0.001
Sinovac-Sinovac-Pfizer	48.85	0 (0.00)	-0.06 (-0.10, -0.02) [‡]	-	0.068
AstraZeneca-AstraZeneca-Pfizer	146.87	0 (0.00)	-0.06 (-0.10, -0.02) [‡]	-	0.001
CLI with Fever					
Unvaccinated (reference group)	158.69	5 (3.15)	Reference	-	-
Sinovac-Sinovac-AstraZeneca	156.25	0 (0.00)	-0.03 (-0.06, -0.004) [‡]	-	0.033
Sinovac-Sinovac-Pfizer	48.85	0 (0.00)	-0.03 (-0.06, -0.004) [‡]	-	0.261
AstraZeneca-AstraZeneca-Pfizer	146.87	0 (0.00)	-0.03 (-0.06, -0.004) [‡]	-	0.038

*Vaccinated group, included only episodes which after final vaccination dose >14 days in the analysis. [†]Multilevel Poisson regression with propensity score (to booster vaccination) stratification analysis. [‡]Rate difference. PCR: polymerase chain reaction. VE: vaccine effectiveness = (1-rate ratio) x 100. CI: confidence interval.

Supplementary table 5. Characteristic and prognostic factor for receiving booster doses

Characteristics	Booster (n=569) n (%)	Not booster (n=631) n (%)	Rate ratio (95% CI)	P-value
Gender				
Male	139 (24.4)	244 (38.7)	0.69 (0.59, 0.80)	<0.001
Female	430 (75.6)	387 (61.3)	-	-
Age in years, mean (SD)	51 (14)	34 (23)	-	<0.001
Age group (years)				
5–18	9 (1.6)	291 (46.1)	0.05 (0.03, 0.09)	<0.001
19–59	383 (67.3)	218 (34.6)	2.05 (1.80, 2.35)	<0.001
≥60	177 (31.1)	122 (19.3)	1.36 (1.21, 1.53)	<0.001
Body mass index*, mean (SD)	25.4 (5.1)	22.6 (5.9)	-	<0.001
Obesity [†]	89 (15.6)	69 (10.9)	1.22 (1.05, 1.42)	0.010
Face mask—ever used when travelling outside[‡]				
Always	1 (0.2)	3 (0.5)	0.53 (0.10, 2.88)	0.459
Mostly	479 (84.2)	411 (65.1)	1.85 (1.54, 2.23)	<0.001
Sometimes	71 (12.5)	132 (20.9)	0.70 (0.58, 0.85)	<0.001
Rarely	18 (3.2)	74 (11.7)	0.39 (0.26, 0.60)	<0.001
Never	0 (0.0)	11 (1.74)	-	-
Household income				
Less than 5,000 Baht	50 (8.8)	115 (18.2)	0.60 (0.48, 0.77)	<0.001
5,000–9,999 Baht	81 (14.2)	123 (19.5)	0.81 (0.68, 0.97)	0.020
10,000–19,999 Baht	151 (26.5)	165 (26.2)	1.01 (0.88, 1.16)	0.878
20,000–29,999 Baht	105 (18.5)	97 (15.4)	1.12 (0.96, 1.30)	0.140
30,000–39,999 Baht	75 (13.2)	59 (9.4)	1.21 (1.03, 1.42)	0.024
40,000 Baht and over	107 (18.8)	72 (11.4)	1.32 (1.15, 1.52)	<0.001

*For age ≥20 years only. [†]Body mass index ≥30 (age ≥20 years). [‡]Self-reported, “ever wear a face mask when travelling outside the home”.
SD: standard deviation. CI: confidence interval.

**Supplementary table 6. Characteristic and prognostic factor for SAR-CoV-2 antibody positive at 1 year
(vaccination status update 31 Jan 2022)**

Characteristics	SAR-CoV-2 antibody positive (n=955) n (%)	SAR-CoV-2 antibody negative (n=146) n (%)	Rate ratio [‡] (95% CI)	P-value
Gender				
Male	272 (28.5)	72 (49.3)	-	-
Female	683 (71.5)	74 (50.7)	0.58 (0.48, 0.70)	<0.001
Age in years, mean (SD)	45 (19)	24 (24)	-	<0.001[§]
Age group (years)				
5–18	167 (17.5)	99 (67.8)	0.26 (0.22, 0.31)	<0.001
19–59	528 (55.3)	28 (19.2)	2.88 (2.05, 4.04)	<0.001
≥60	260 (27.2)	19 (13.1)	2.09 (1.36, 3.22)	0.001
Body mass index*, mean (SD)	24.6 (5.4)	20.5 (6.4)	-	<0.001[§]
Obesity [†]	123 (15.8)	11 (23.4)	0.68 (0.39, 1.16)	0.157
Prior vaccination	929 (97.3)	41 (28.1)	3.46 (2.67, 4.49)	<0.001
Prior infection	41 (4.3)	1 (0.7)	6.27 (0.87, 45.22)	0.069

*For age ≥20 years only. †Body mass index ≥30 (age ≥20 years). ‡Negative binomial regression. §t-test. SD: standard deviation. CI: confidence interval.

Supplementary table 7. Gender risk differences

Variable	Females (n=817) n (%)	Males (n=383) n (%)	Rate ratio [§] (95% CI)	P-value
Age year, mean (SD)	44 (20)	36 (23)	-	<0.001[¶]
Age group (years)				
5–18	148 (18.1)	152 (39.7)	0.46 (0.38, 0.55)	<0.001
19–59	452 (55.3)	149 (38.9)	1.42 (1.24, 1.64)	<0.001
≥60	217 (26.6)	82 (21.4)	1.24 (0.99, 1.55)	0.058
Body mass index*, mean (SD)	24.3 (5.5)	23.0 (6.0)	-	<0.001[¶]
Obesity [†]	116 (17.0)	26 (11.4)	1.53 (1.08, 2.17)	0.016
Face mask—ever used when travelling outside[‡]				
Always	2 (0.2)	2 (0.5)	0.47 (0.07, 3.32)	0.448
Mostly	639 (78.2)	251 (65.5)	1.19 (1.10, 1.29)	<0.001
Sometimes	122 (14.9)	81 (21.2)	0.71 (0.55, 0.91)	0.007
Rarely	49 (6.0)	43 (11.2)	0.53 (0.36, 0.79)	0.002
Never	5 (0.6)	6 (1.6)	0.39 (0.12, 1.27)	0.119
COVID-19-like illness	133 (16.3)	58 (15.1)	1.03 (0.93, 1.14)	0.609
COVID-positive	28 (3.4)	22 (5.7)	0.60 (0.35, 1.03)	0.063
Not vaccinated	79 (9.67)	87 (22.7)	0.43 (0.32, 0.56)	<0.001

*For age ≥20 years only. [†]Body mass index ≥30 (age ≥20 years). [‡]Self-reported, "ever wear a face mask when travelling outside the home".

[§]Negative binomial regression. [¶]t-test. SD: standard deviation. CI: confidence interval.