

Supplementary table 1: Summary data on reviewed studies.

Author	Peer-reviewed*	Primary regimen		Booster Dose	Prior infection	Breakthrough infection	Hybrid immunity	number of samples	Age (median, range)	Sex distribution (% female)	fold-change CD4	fold-change CD8	Type of analysis	Comments
		Dose 1	Dose 2											
Keeton et al.	YES	Janssen - Ad26.CoV2.S	-	-	-	-	-	20	41 [not provided]	75	0.86	0.80	Frequency of spike-specific T cells producing any of the measured cytokines (IFN- γ , IL-2 or TNF) in response to peptide pools.	
		Janssen - Ad26.CoV2.S	-	-	-	-	-	20	38 [not provided]	75	0.78	0.76		
		PfizerBioNTech - BNT162b2	PfizerBioNTech - BNT162b2	-	-	-	-	15	53 [not provided]	53	0.70	0.83		
		-	-	-	-	WT / Beta	-	15	39 [not provided]	12	0.77	0.75		
Tarke et al.	YES	mRNA	mRNA	-	-	-	-	19	not provided	not provided	0.84	0.85	CD3 ⁺ CD4 ⁺ and CD3 ⁺ CD8 ⁺ AIM staining with OX40+CD137 ⁺ and CD69 ⁺ CD137 ⁺ markers, respectively.	
De Marco et al.	NO	multiple	multiple	-	-	-	-	10	43 [23-56]	70	0.84	0.83	Activation marker staining (CD69, CD40L for CD4 ⁺ and CD69 and CD137 for CD8 ⁺ T cells after peptide pool stimulation.	Data calculated from high-resolution figures; might not be 100% exact.
		mRNA	mRNA	mRNA	-	-	-	15	52 [26-60]	66	0.75	0.91		
		multiple	multiple	multiple (heterologous)	-	-	-	11	53 [26-62]	73	0.78	0.93		
		multiple	multiple	(multiple)	YES	-	YES	12	54 [22-60]	33	0.82	0.89		
		multiple	multiple	(multiple)	-	YES	YES	13	37 [21-54]	69	0.85	0.94		
Gao et al.	YES	PfizerBioNTech - BNT162b2	PfizerBioNTech - BNT162b2	-	-	-	-	40	53 [22-79]	58	0.91	0.92	CD4 ⁺ T cell responses (CD69 ⁺ CD154 ⁺) and CD8 ⁺ T cell responses (CD69 ⁺ CD137 ⁺) after peptide pool stimulation.	
		-	-	-	YES	-	-	26	54 [44-68]	31	0.84	0.70		
Liu et al.	YES	Janssen - Ad26.CoV2.S	-	-	-	-	-	20	43 [24-52]	55	0.97	0.86	IFN ⁺ CD4 ⁺ and CD8 ⁺ responses by ICS staining after peptide pool stimulation.	
		PfizerBioNTech - BNT162b2	PfizerBioNTech - BNT162b2	-	-	-	-	27	32 [22-67]	96	0.82	0.82		
Naranbhai et al.	YES	multiple	multiple	-	-	-	-	24	not provided	not provided	0.91	0.44	CD4 ⁺ and CD8 ⁺ CFSE (carboxyfluorescein succinimidyl ester (CFSE) proliferation assay) responses after peptide pool stimulation.	
		multiple	multiple	-	YES	-	YES	12			1.00	0.62		
		multiple	multiple	multiple (heterologous)	YES	-	YES	13			1.14	0.83		
Tan et al.	NO	PfizerBioNTech - BNT162b2	PfizerBioNTech - BNT162b2	-	-	-	-	41	36 [23-84]	78	1.00	0.94	IFN ⁺ CD4 ⁺ and CD8 ⁺ responses by ICS staining after peptide pool stimulation.	Data calculated with raw data (supplementary) including two-dose data from a booster graph. No raw data were provided for the booster analysis.
		PfizerBioNTech - BNT162b2	PfizerBioNTech - BNT162b2	Janssen - Ad26.CoV2.S	-	-	-	41			0.96	1.19		
		PfizerBioNTech - BNT162b2	PfizerBioNTech - BNT162b2	-	-	-	-	24			0.82	0.85		
		PfizerBioNTech - BNT162b2	PfizerBioNTech - BNT162b2	PfizerBioNTech - BNT162b2	-	-	-	24			0.89	1.18		
		PfizerBioNTech - BNT162b2	PfizerBioNTech - BNT162b2	PfizerBioNTech - BNT162b2	-	-	-	24			0.89	1.18		
Geurtsvankessel et al.	YES	AstraZeneca - Vaxzevria	AstraZeneca - Vaxzevria	-	-	-	-	15	63 [61-65]	60	0.58	0.18	CD3 ⁺ CD4 ⁺ and CD3 ⁺ CD8 ⁺ AIM staining with OX40 ⁺ CD137 ⁺ and CD69 ⁺ CD137 ⁺ markers, respectively.	Vaccine-specific data calculated from supplementary data only including subjects with reported measurements.
		Janssen - Ad26.CoV2.S	-	-	-	-	-	13	39 [20-58]	92	1.17	1.56		
		Moderna - mRNA-1273	Moderna - mRNA-1273	-	-	-	-	14	35 [26-57]	79	0.94	1.80		
		PfizerBioNTech - BNT162b2	PfizerBioNTech - BNT162b2	-	-	-	-	5	46 [36-57]	80	0.94	0.57		
		Moderna - mRNA-1273	Moderna - mRNA-1273	PfizerBioNTech - BNT162b2	-	-	-	9	29 [26-52]	78	5.21	19.70		
Schultz et al.	NO	Sinovac - CoronaVac	Sinovac - CoronaVac	Sinovac - CoronaVac	-	-	-	30	not provided	not provided	0.83	-	CD3 ⁺ CD4 ⁺ AIM staining with OX40 ⁺ CD137 ⁺ .	
Madelon et al.	NO	mRNA	mRNA	-	-	-	-	20	46 [not provided]	45	0.62	0.79	CD4 ⁺ and CD8 ⁺ AIM staining with OX40 ⁺ 41-BB ⁺ and CD69 ⁺ 41-BB ⁺ markers, respectively.	anti-CD20-treated multiple sclerosis patients.
		mRNA	mRNA	mRNA	-	-	-	20			0.72	0.71		
Soto et al.	NO	Sinovac - CoronaVac	Sinovac - CoronaVac	-	-	-	-	32	not provided [3-17]	not provided	1.63	-	CD3 ⁺ CD4 ⁺ AIM staining with OX40 ⁺ CD137 ⁺ .	3-17 year-old children.
Mazzoni et al.	YES	PfizerBioNTech - BNT162b2	PfizerBioNTech - BNT162b2	-	-	-	-	11	56 [23-65]	64	0.87	-	Spike-specific CD4 ⁺ T cells by ICS staining (IFN- γ and IL-2) after peptide pool stimulation.	
		PfizerBioNTech - BNT162b2	PfizerBioNTech - BNT162b2	PfizerBioNTech - BNT162b2	-	-	-	9	not provided	not provided	0.82	-		
Choi et al.	YES	PfizerBioNTech - BNT162b2	PfizerBioNTech - BNT162b2	-	-	-	-	12	not provided	not provided	0.84	0.80	Spike-specific CD4 ⁺ and CD8 ⁺ T cells by ICS staining (IFN- γ) after peptide pool stimulation.	

* at submission of this review.