Results of COVID-19 Vaccine Effectiveness Studies: An Ongoing Systematic Review

Weekly Summary Tables: Primary Series Vaccination

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1. Summary of Study Results for Post-Authorization COVID-19 Vaccine Effectiveness of Primary Series#

(Detailed methods available on VIEW-hub Resources page: https://view-hub.org/resources)

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
445	Tamada et al* (January 29, 2024)	Japan	Test-negative case control	17,080 adults ≥65 years	Omicron BA.1, BA.2, BA.4/5††	Included	BNT162b2 or mRNA-1273	Documented infection	12.8 (-11.0-31.7)	14+	~95 weeks
444	Kassanjee et al (January 25, 2024) *Note: ~2% of Ad2.COV2.S and ~6% of BNT162b2 recipients received a booster dose.*	South Africa	Retrospective cohort	2,429,927 adult public sector healthcare users aged ≥18 years	Omicron BA.4/5^	Included	BNT162b2	Hospitalization or death	19 (7-30)	14+	~59 weeks
									51 (33-64)	<3 months	
									-20 (-56-8)	9+ months	
								Hospitalization with severe disease or death	33 (15-47)	14+	
									69 (45-82)	<3 months	
									6 (-41-38)	9+ months	
								Death	41 (19-58)	14+	
									84 (57-94)	<3 months	
									-4 (-74-37)	9+ months	
							Ad26.COV2.S	Hospitalization or death	22 (1-39)	14+	
									53 (32-67)	<3 months	
									-15 (-61-18)	9+ months	
								Hospitalization with severe disease or death	20 (-19-46)	14+	
									63 (27-81)	<3 months	
									-12 (-92-35)	9+ months	
								Death	40 (-8-66)	14+	
									84 (49-95)	<3 months	
									-9 (-128-47)	9+ months	
					Omicron BA.1/2^		BNT162b2	Hospitalization or death	41 (37-45)	14+	~49 weeks
									47 (41-52)	<3 months	
									30 (8-47)	6-8 months	
								Hospitalization with severe disease or death	52 (45-57)	14+	
									55 (46-63)	<3 months	
									37 (0-60)	6-8 months	
								Death	56 (49-63)	14+	
									61 (49-70)	<3 months	
									44 (0-69)	6-8 months	
							Ad26.COV2.S	Hospitalization or death	33 (24-41)	14+	
									38 (29-46)	<3 months	
									19 (-9-40)	6-8 months	
								Hospitalization with severe disease or death	48 (33-59)	14+	
									51 (36-62)	<3 months	
									31 (-16-58)	6-8 months	
								Death	49 (31-63)	14+	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
									54 (34-67)	<3 months	
									33 (-29-65)	6-8 months	
					Delta^		BNT162b2	Hospitalization or death	90 (88-92)	<3 months	~26 weeks
								Hospitalization with severe disease or death	92 (90-94)		
								Death	92 (90-94)		
							Ad26.COV2.S	Hospitalization or death	62 (49-72)		
								Hospitalization with severe disease or death	67 (47-80)		
								Death	64 (35-80)		
443	Molnar et al* (January 24, 2023)	Hungary	Retrospective cohort	1,648 adults aged 65-100 years with type 2 diabetes mellitus	Delta^	Excluded	BNT162b2	Death	84.8 (77.3- 89.8)	14-120	~35 weeks
									74.1 (70.3- 77.4)	181-240	
							mRNA-1273		80.2 (71.6- 86.3)	181-240	
							Sputnik-V		82.5 (74.5- 88.0)	181-240	
							AZD1222		74.2 (66.9- 80.0)	121-180	
									64.0 (48.1- 75.0)	181-240	
							BBIBP-CorV		73.7 (59.9- 82.7)	121-180	
									47.2 (37.3- 55.5)	181-240	
				8,711 adults aged 65-100 years with type 2 diabetes mellitus			BNT162b2	Documented infection	71.6 (66.3- 76.1)	14-120	
									50.1 (47.2- 52.9)	181-240	
							mRNA-1273		70.8 (66.0- 74.9)	181-240	
							Sputnik-V		51.9 (46.4- 56.9)	181-240	
							AZD1222		52.6 (48.0- 56.7)	121-180	
									40.7 (30.1- 49.7)	181-240	
							BBIBP-CorV		34.4 (24.5- 43.0)	121-180	
									20.5 (14.6- 26.0)	181-240	
				2,071 non-diabetic adults aged 65-100 years			BNT162b2	Death	75.4 (64.6- 82.9)	14-120	
									75.2 (70.6- 79.1)	181-240	
							mRNA-1273		83.0 (72.5- 89.5)	181-240	
							Sputnik-V		80.6 (72.7- 86.2)	181-240	
							AZD1222		78.5 (70.4- 84.3)	121-180	
									66.2 (48.4- 77.9)	181-240	
							BBIBP-CorV		58.5 (41.0- 70.8)	121-180	
									47.5 (36.7- 56.4)	181-240	
				15,456 non-diabetic adults aged 65-100 years			BNT162b2	Documented infection	64.5 (59.2- 69.2)	14-120	
									38.8 (35.5- 41.9)	181-240	
							mRNA-1273		62.1 (56.6- 66.9)	181-240	
							Sputnik-V		29.0 (23.9- 33.9)	181-240	
							AZD1222		45.0 (40.5- 49.2)	121-180	
									32.6 (22.2- 41.5)	181-240	
							BBIBP-CorV		17.2 (8.3- 25.2)	121-180	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
									1.4 (-4.4- 7.0)	181-240	
				552 adults aged 45-64 years with type 2 diabetes mellitus			BNT162b2	Death	88.7 (76.0; 94.7)	14-120	
									77.0 (68.3; 83.3)	181-240	
							mRNA-1273		75.7 (52.8; 87.5)	181-240	
							Sputnik-V		81.8 (70.6; 88.7)	181-240	
							AZD1222		85.3 (76.4; 90.9)	121-180	
									70.5 (53.1; 81.4)	181-240	
							BBIBP-CorV		51.7 (22.8; 69.8)	121-180	
									60.0 (38.8; 73.8)	181-240	
				9,338 adults aged 45-64 years with type 2 diabetes mellitus			BNT162b2	Documented infection	75.7 (70.9; 79.7)	14-120	
									45.9 (41.8; 49.7)	181-240	
							mRNA-1273		61.1 (54.3; 66.8)	181-240	
							Sputnik-V		40.8 (35.7; 45.5)	181-240	
							AZD1222		48.0 (43.8; 51.8)	121-180	
									26.8 (20.0; 33.0)	181-240	
							BBIBP-CorV		30.1 (21.8; 37.6)	121-180	
									20.5 (12.3; 27.8)	181-240	
				1,107 non-diabetic adults aged 45-64 years			BNT162b2	Death	88.4 (77.6; 94.0)	14-120	
									88.3 (82.4; 92.2)	181-240	
							mRNA-1273		91.2 (76.6; 96.7)	181-240	
							Sputnik-V		85.0 (79.0; 89.2)	181-240	
							AZD1222		86.6 (78.3; 91.7)	121-180	
									64.9 (39.3; 79.7)	181-240	
							BBIBP-CorV		73.0 (57.4; 82.9)	121-180	
									60.2 (43.7; 71.9)	181-240	
				76,527 non-diabetic adults aged 45-64 years			BNT162b2	Documented infection	71.2 (69.0; 73.2)	14-120	
									17.7 (15.0; 20.4)	181-240	
							mRNA-1273		48.6 (44.9; 51.9)	181-240	
							Sputnik-V		7.9 (5.2; 10.5)	181-240	
							AZD1222		26.0 (23.3; 28.6)	121-180	
									-14.1 (-20.5; -8.1)	181-240	
							BBIBP-CorV		7.8 (4.1; 11.3)	121-180	
									-10.4 (-15.2; -5.9)	181-240	
442	Bøås et al* (January 15, 2024)	Norway	Retrospective cohort	188,022 individuals with prior infection (all ages)	Omicron BA.1^	Previously infected only	BNT162b2 or mRNA-1273 *(Note: A small proportion of participants received*	Documented infection	60 (58-62)	7-179	~53 weeks
									63 (59-68)	180+	
				53,066 individuals with prior infection (all ages)	Delta^				65 (48-76)	7-179	~46 weeks
									15 (-37-47)	180+	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				59,683 individuals with prior infection (all ages)	Alpha^		*AZD1222 or Ad26.COV2.S)*		60 (-78-91)	7-179	~23.5 weeks
441	Poukka et al* (January 10, 2024)	Denmark, Finland, Norway, Sweden	Retrospective cohort / target trial emulation	1,938,589 adolescents aged 12-17 years	**Omicron BA.1, BA.2, BA.4, BA.5^**	Included	BNT162b2	Hospitalization with a COVID-19-related diagnosis	70.4 (46.3-94.5)	14-180	24 weeks
								Documented infection	25.1 (8.9-41.3)		
							mRNA-1273	Hospitalization with a COVID-19-related diagnosis	80.2 (34.5-100)		
								Documented infection	15.7 (-24.7-56.0)		
							Any mRNA	Hospitalization with a COVID-19-related diagnosis	85.5 (65.1-100)		
								Documented infection	22 (-9.3-53.4)		
					Delta and **Omicron BA.1, BA.2, BA.4, BA.5^**		BNT162b2	Hospitalization with a COVID-19-related diagnosis	72.6 (62.5-82.7)	14-180	24 weeks
									65.6 (55.4-75.8)	14-365	50 weeks
								Documented infection	22.2 (4.5-39.8)	14-180	24 weeks
									20 (3.5-36.6)	14-365	50 weeks
							mRNA-1273	Hospitalization with a COVID-19-related diagnosis	86 (56.8-100)	14-180	24 weeks
									91 (72.6-100)	14-365	50 weeks
								Documented infection	3.6 (-37-44.1)	14-180	24 weeks
									3.3 (-33.3-40)	14-365	50 weeks
							Any mRNA	Hospitalization with a COVID-19-related diagnosis	80.7 (58-100)	14-180	24 weeks
									82.5 (63.6-100)	14-365	50 weeks
								Documented infection	27.8 (-1.1-56.7)	14-180	24 weeks
									27.3 (0.5-54.1)	14-365	50 weeks
440	Ye et al* (December 14, 2023)	China	Test-negative case-control	44,632 cases and test-negative contacts 3 years and older, outbreak setting	**Omicron BA.2^**	Included	CoronaVac	Symptomatic disease	14 (-11-33)	28+	~61 weeks
							BBIBP-CorV		20 (-10-43)		~66 weeks
439	Birk et al* (December 29, 2023)	Denmark	Retrospective cohort	127,249 adolescents aged 12-18 y	Delta, **Omicron BA.1^**	Excluded	BNT162b2	Documented infection (12-15 y)	96.2 (95.4-96.9)	0-56	~24 weeks
									5.8 (4.6-7)	57-182	
								Documented infection (16-18 y)	95.5 (94.8-96.1)	0-56	
									9.2 (7.7-10.6)	57-182	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
438	Cheng et al* (December 26, 2023)	Hong Kong SAR	Retrospective cohort	19,626 patients with chronic kidney disease aged ≥18 years	Omicron BA.2^	Excluded	BNT162b2	Documented infection	35 (31-39)	14+	~51 weeks
								Hospitalization	66 (62-80)		
				37,615 patients with chronic kidney disease aged ≥18 years			CoronaVac	Documented infection	29 (26-32)		
								Hospitalization	63 (60-66)		
437	Arashiro et al* (December 19, 2023)	Japan	Retrospective cohort	179 patients aged ≥16 years	Delta^	Included	Any mRNA	Severe disease requiring oxygen therapy	95.2 (88.7–98.0)	14-180 (median 76)	~24 weeks
								Severe disease requiring mechanical ventilation	99.6 (97.3–99.9)	14-180 (median 83)	
								Fatal disease	98.6 (92.3–99.7)	14-180 (median 83)	
								Severe disease requiring oxygen therapy with respiratory failure	95.5 (89.3–98.1)	14-180 (median 79)	
				471 patients aged ≥16 years	Omicron BA.1, BA.2^			Severe disease requiring oxygen therapy	37.0 (-50.9–73.7)	14-180 (median 155)	~65 weeks
									47.9 (-2.1–73.4)	>180 (median 218)	
								Severe disease requiring mechanical ventilation	73.7 (-30.6–94.7)	14-180 (median 149)	
									82.7 (37.1–95.3)	>180 (median 215)	
								Fatal disease	43.1 (-213.4–89.7)	14-180 (median 139)	
									59.5 (-41.9–88.4)	>180 (median 216)	
								Severe disease requiring oxygen therapy with respiratory failure	41.1 (-43.9–75.9)	14-180 (median 155)	
									50.2 (1.1–75.0)	>180 (median 218)	
436	Qin et al* (December 12, 2023)	Hong Kong SAR	Retrospective cohort	216,370 adults (18+ y) with COPD or asthma	Delta, Omicron BA.2, BA.5††	Excluded	CoronaVac	Hospitalization	18 (6-23)	0+	~88 weeks
								Severe disease	29 (12-43)		
								Death	77 (74-80)		
							BNT162b2	Hospitalization	33 (30-37)		~87 weeks
								Severe disease	57 (45-66)		
								Death	92 (91-94)		
435	Rose et al* (November 23, 2023)	Multiple (Europe)	Test-negative case control	5141 adults (aged 20+ y)	Omicron BA.1, BA.2^, BA.5††	Included	BNT162b2	Hospitalization with SARI	49 (34-60)	150+	~78 weeks
							mRNA-1273		50 (14-71)		~75 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				hospitalized with SARI in 10 European countries			AZD1222		30 (-10-56)		~71 weeks
434	Rose et al* (November 23, 2023)	Multiple (Europe)	Test-negative case control	4736 adults (aged 20+ y) hospitalized with SARI in 9 European countries	Delta^	Included	BNT162b2	Hospitalization with SARI	82 (77-86)	14+	~47 weeks
									54 (18-74)	150+	
							AZD1222		69 (57-78)	14+	~40 weeks
							Ad26.COV2.S		60 (37-75)		~33 weeks
							mRNA-1273		89 (81-94)		~44 weeks
					Alpha^		BNT162b2		85 (69-92)	14+	~19 weeks
433	Szekanecz et al* (November 2, 2023)	Hungary	Retrospective cohort	263,116 immunocompromised adults (18-84 y)	Delta^	Excluded	BNT162b2	Documented infection	73 (68.8-76.7)	14-120	~32 weeks
									38.7 (35.1-42.1)	181-240	
						Included		Death	53 (7.7-76.1)	14-120	
									51.1 (33.3-64.1)	181-240	
				6,128,518 non-immunocompromised adults (18-84 y)		Excluded		Documented infection	68.1 (66.8-69.3)	14-120	
									16.1 (14.2-17.9)	181-240	
						Included		Death	74.9 (64.6-82.2)	14-120	
									80.8 (76.6-84.2)	181-240	
432	Çulpan et al* (November 15, 2023)	Turkey	Retrospective cohort	3009 healthcare workers at a hospital in Istanbul	Delta^	Excluded	BNT162b2	Documented infection	82.3 (68-90.2)	14+	~30 weeks
							CoronaVac		21 (-20.7-48.3)		~42 weeks
431	Goh et al* (November 10, 2023)	Singapore	Retrospective cohort	7292 infants born to parents who had a SARS-CoV-2 infection after their birth and before 6 months of age	**Omicron XBB^, XBB.1.5††**	Included (refers to mothers)	Any mRNA before pregnancy	Documented infection in infants	60.7 (-56.6-90.1)	14+	~126 weeks
							Any mRNA during pregnancy		73 (-30.6-94.4)		~63 weeks
					Omicron BA.2, BA.5, XBB^, XBB.1.5††		Any mRNA before pregnancy		18.3 (-14.6-41.8)		~126 weeks
							Any mRNA during pregnancy		37.6 (17.2-53.1)		~63 weeks
430	Razafimandimby et al* (October 30, 2023)	Canada	Test-negative case control	40,330 children aged 5-11 years	**Omicron BA.1, BA.2, BA.4/5^**	Excluded	BNT162b2	Any infection	20 (13-26)	14+	~54 weeks
									42 (35-49)	14-55	
									2 (-7-11)	56-385	
								Any infection, 21-*55 days in between doses*	10 (-2-21)	14+	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								Any infection, *84-362 days in between doses*	39 (20-55)	14+	
								Symptomatic disease (ambulatory centers)	47 (40-54)	14+	
									68 (62-74)	14-55	
									25 (11-36)	56-385	
								Symptomatic disease (ambulatory centers), *21-55 days in between doses*	48 (36-57)	14+	
								Symptomatic disease (ambulatory centers), *84 -362 days in between doses*	45 (10-68)	14+	
								Symptomatic disease (Acute care hospitals)	42 (30-52)	14+	
									41 (17-59)	14-55	
									42 (29-53)	56-385	
								Symptomatic disease (Acute care hospitals), *21-55 days in between doses*	18 (-17-44)	14+	
								Symptomatic disease (Acute care hospitals), *84-362 days in between doses*	69 (43-86)	14+	
					Omicron BA.1^			Any infection	40 (31-47)	14+	~13 weeks
								Symptomatic disease (ambulatory centers)	70 (63-76)		
								Symptomatic disease (Acute care hospitals)	27 (-13-53)		
					Omicron BA.2^			Any infection	14 (0-26)		~25 weeks
								Symptomatic disease (ambulatory centers)	32 (13-47)		
								Symptomatic disease (Acute care hospitals)	47 (26-62)		
					Omicron BA.4/5^			Any infection	-5 (-22-9)		~54 weeks
								Symptomatic disease (ambulatory centers)	-15 (-55-14)		
								Symptomatic disease (Acute care hospitals)	38 (18-54)		
429	Tartof et al* (October 25, 2023)	USA	Test-negative case control		**Omicron BA.4/5, XBB^,**	Included	Any mRNA	Severe disease	29 (-7-53)	14+	~116 weeks
								Hospitalization	27 (13-39)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				123,419 individuals aged ≥18 years	XBB.1.5, XBB.1.16††			ED/UC visit	18 (12-24)		
								Outpatient visit	14 (6-21)		
428	Yiu et al* (October 10, 2023)	Hong Kong SAR	Case control	13,849 cases and 127,793 controls among adults (aged 18+ y) with a diagnosed mental disorder	Omicron BA.2^	Excluded	BNT162b2	Hospitalization due to COVID-19	71.1 (68-73.9)	14+	~70 weeks
								Death	86.1 (80.5-90.1)		
							CoronaVac	Hospitalization due to COVID-19	46.1 (42.7-49.3)		~71 weeks
								Death	59.5 (53.7-64.6)		
427	Lee et al* (November 24, 2023) *[Update to August 25, 2023 preprint]* **3.2% received AZ+mRNA as their primary series*	Canada	Test-negative case control	54,994 adults aged ≥50 years	Omicron BA.1/BA.2^	No prior infection	Any mRNA	Severe disease	80 (78-83)	3 months	~47 weeks
									80 (77-82)	15 months	
				29,362 adults ≥50 years	Omicron BA.4/5^				43 (19-60)	3 months	~65 weeks
									49 (41-56)	15 months	
				24,948 adults ≥50 years	Omicron BQ/XBB^				25 (-61-65)	3 months	~80 weeks
									31 (17-43)	15 months	
426	Hernandez-Avila et al* (October 19, 2023)	Mexico	Test-negative case control	28,271 pensioners aged 65+ years	Delta^	Excluded	BNT162b2	Symptomatic infection	74.3 (70.5-77.6)	≤90	~33 weeks
									66.9 (62.7-70.7)	≥141	
								Hospitalization due to ARI	87.5 (84.9-89.7)	≤90	
									80.5 (77.4- 83.2)	≥141	
								Severe disease	90.4 (87.8- 92.4)	≤90	
									85.3 (82.3- 87.8)	≥141	
								Death	90.3 (87.7- 92.4)	≤90	
									85.7 (82.8-88.2)	≥141	
							AZD1222	Symptomatic infection	61.2 (56.9-65.1)	≤90	
									51.8 (43.5-58.8)	≥141	
								Hospitalization due to ARI	81.1 (78.4-83.5)	≤90	
									70.5 (64.2-75.8)	≥141	
								Severe disease	85.3 (82.8-87.5)	≤90	
									73.5 (66.5-79.1)	≥141	
								Death	85.4 (82.9-87.6)	≤90	
									73.6 (66.6-79.2)	≥141	
							CoronaVac	Symptomatic infection	47 (39.6-53.5)	≤90	
									34.9 (26.2-42.6)	≥141	
								Hospitalization due to ARI	69.8 (64.5-74.2)	≤90	
									57.8 (51-63.6)	≥141	
								Severe disease	75.4 (70.3-79.7)	≤90	
									59.2 (51.6-65.5)	≥141	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								Death	75.6 (70.5-79.8)	≤90	
									59.2 (51.6-65.5)	≥141	
							Ad5-nCoV	Symptomatic infection	29 (5.3-46.7)	≤90	
									43.6 (32.1-53.1)	≥141	
								Hospitalization due to ARI	58.2 (39-71.3)	≤90	
									58.8 (48.7-66.9)	≥141	
								Severe disease	69.4 (50.6-81)	≤90	
									63.8 (53.2-72)	≥141	
								Death	69.1 (50-80.8)	≤90	
									64.1 (53.6-72.3)	≥141	
							Sputnik V	Symptomatic infection	68.5 (59.5-75.5)	≤90	
									75.5 (69.1-80.6)	≥141	
								Hospitalization due to ARI	90.4 (85.5-93.7)	≤90	
									87.1 (82.2-90.6)	≥141	
								Severe disease	94.8 (90.5-97.2)	≤90	
									91.8 (87.3-94.7)	≥141	
								Death	95.2 (91-94.7)	≤90	
									91.8 (87.3-94.7)	≥141	
425	Wee et al* (October 16, 2023)	Singapore	Retrospective cohort	121,628 children aged 1-4 years	Omicron XBB^	Excluded	mRNA-1273	Documented infection	62.2 (38.8-76.6)	7-128	~29 weeks
424	Chemaitelly et al* (October 4, 2023)	Qatar	Retrospective cohort	56,802 matched pairs of individuals (all ages) with prior infection	Omicron BA.2, BA.4/5, BA.2.75^	All previously infected with Omicron	Any mRNA	Documented infection	57 (51-61)	90+	~85 weeks
423	Patel et al* (September 29,2023)	USA	Test-negative case control	28,020 encounters among patients with any disability and 632,714 encounters among patients without a disability aged 18+	Omicron BA.1, BA.2, BA.5††	Included	Any mRNA	ED/UC encounters in persons with any disability	45 (36-52)	14+	~82 weeks
								Hospitalization in persons with any disability	45 (38-52)		
								ED/UC encounters in persons with no disability	31 (29-32)		
								Hospitalization in persons with no disability	45 (43-48)		
					Delta^			ED/UC encounters in persons with any disability	79 (75-83)	14+	~42 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								Hospitalization in persons with any disability	79 (76-83)		
								ED/UC encounters in persons with no disability	82 (82-83)		
								Hospitalization in persons with no disability	87 (86-87)		
422	Mimura et al* (September 23, 2023)	Japan	Retrospective cohort	203,574 matched pairs of adults aged 65+	Delta^	Excluded	BNT162b2	Documented infection	78.1 (65.2-87.8)	7+	~22 weeks
								Symptomatic disease	79.1 (64.6-88.9)		
								Hospitalization	93.5 (83.7-100)		
421	Tartof et al* (September 15, 2023)	USA	Test-negative case control	24,261 young children aged 6 months - 4 years with ARI	**Omicron BA.4/5, BQ.1, XBB^**	Included	BNT162b2 (3-dose primary series, pediatric dose)	Emergency Dept (ED) or Urgent Care (UC) encounter	10 (-40-42)	14+	~35 weeks
								Other outpatient encounter	21 (-41-56)		
420	Irala et al* (September 15,2023)	Paraguay	Test-negative case control	4,229 patinets aged ≥5 years	**Omicron BA.1^**	Included	Any mRNA	Hospitalization due to severe acute respiratory infection (SARI)	45.3 (5.8–68.7)	14+	~52 weeks
							AZD1222		10.0 (-31.3–38.2)		
							Sputnik V		25.4 (-30.2–57.5)		
							BBIBP-CorV		42.3 (-2.0–67.6)		
							Covaxin		13.0 (-46.1–48.0)		
					Delta^		Any mRNA		90.4 (74.3–97.3)		~37 weeks
							AZD1222		83.2 (67.8–91.9)		
							Sputnik V		82.9 (53.0–95.2)		
							BBIBP-CorV		29.7 (-42.6–67.3)		
							Covaxin		24.9 (-36.9–59.8)		
419	Chen et al (September 14,2023)	UK	Nested test-negative case control	583,541 patients with immunocompromising conditions	Alpha, Delta, **Omicron BA.1^**	Included	BNT162b2	Hospitalization	77 (63-86)	14-41	~50 weeks
									49 (13-70)	182-272	
							AZD1222		43 (-9-70)	14-41	
									31 (-33- 64)	42-97	
418	Paternina-Caicedo et al* (September 9, 2023)	Colombia	Test-negative case control	275,504 individuals aged 18+	**Omicron BA.1††**	Included	AZD1222	Symptomatic disease	36 (24-47)	14-44	~43 weeks
									-8 (-34-13)	≥165	
								Hospitalization	10 (-78-55)	14+	
							CoronaVac	Symptomatic disease	37 (8-56)	14-44	~46 weeks
									-36 (-48-24)	≥165	
								Hospitalization	7 (-41-38)	14+	
							BNT162b2	Symptomatic disease	59 (45-70)	14-44	~47 weeks
									4 (-2-11)	≥165	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								Hospitalization	45 (1-70)	14+	
							mRNA-1273	Symptomatic disease	65 (54-74)	14-44	~25 weeks
									-22 (-639-80)	≥165	
								Hospitalization	95 (54-99)	14+	
							Ad26.COV2.S	Symptomatic disease	34 (11-51)	14-44	~33 weeks
									-29 (-43- -17)	≥165	
								Hospitalization	-5 (-158-57)	14+	
					Delta^	Excluded	AZD1222	Symptomatic disease	-2 (-32-21)	14-44	~32 weeks
									54 (-177-92)	≥165	
								Hospitalization	71 (27-89)	14+	
							CoronaVac	Symptomatic disease	31 (10-47)	14-44	~35 weeks
									34 (18-47)	≥165	
								Hospitalization	63 (35-79)	14+	
							BNT162b2	Symptomatic disease	10 (-20-33)	14-44	~36 weeks
									62 (57-67)	≥165	
								Hospitalization	91 (79-96)	14+	
							mRNA-1273	Symptomatic disease	52 (41-61)	14-44	~14 weeks
									89 (-8-99)	105–134	
							Ad26.COV2.S	Symptomatic disease	7 (-19-27)	14-44	~22 weeks
									70 (-5-92)	≥165	
								Hospitalization	73 (23-91)	14+	
					Mu^	Excluded	AZD1222	Symptomatic disease	62 (26-81)	14-44	~14 weeks
								Hospitalization	-57 (-1646-86)	14+	
							CoronaVac	Symptomatic disease	56 (46-65)	14-44	~18 weeks
									59 (-385-97)	≥165	
								Hospitalization	68 (24-86)	14+	
							BNT162b2	Symptomatic disease	67 (61-72)	14-44	~19 weeks
									77 (53-89)	≥165	
								Hospitalization	88 (59-96)	14+	
							Ad26.COV2.S	Symptomatic disease	50 (33-63)	14-44	~5 weeks
417	Copland et al (September 7, 2023)	UK	Nested case control	81,793 patients (aged 12+ y) with blood cancer in England	Alpha, Delta, **Omicron BA.1^**	Included	BNT162b2	Hospitalization	72 (18-89)	14-41	~65 weeks
									-46 (-130-7)	182+	
								Death	64 (-3-87)	42-97	
									-52 (-176-17)	182+	
							AZD1222	Hospitalization	15 (-77-59)	14-41	~56 weeks
									6 (-47-39)	182+	
								Death	-13 (-188-55)	42-97	
									-100 (-283 to -4)	182+	
				12,177,241 individuals			BNT162b2	Hospitalization	61 (56-66)	14-41	~65 weeks
									-38 (-48 to -29)	182+	
								Death	80 (73-85)	14-41	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				(aged 12+ y) in England					-97 (-127 to -72)	182+	
							AZD1222	Hospitalization	66 (61-70)	14-41	~56 weeks
									-22 (-31 to -13)	182+	
								Death	62 (43-75)	14-41	
									-74 (-101 to -50)	182+	
416	Ogilvie et al (September 8, 2023)	USA	Retrospective cohort	827,149 children aged 5-17 years	Omicron BA.1, BA.2††	Excluded if COVID-19 diagnosis ≤ 30 days	BNT162b2	Documented infection	9 (-1-19)	14+	~69 weeks
								Hospitalization or ED visit	13 (-39-46)		
					Delta^			Documented infection	61 (59-64)	14+	~47 weeks
								Hospitalization or ED visit	78 (71-83)		
					Non-VOC, Alpha^			Documented infection	61 (52-68)	14+	~17 weeks
								Hospitalization or ED visit	65 (4-87)		
415	Zerbo et al* (August 25, 2023)	USA	Test-negative case control	57,688 pregnant females aged 16-49 years	Omicron BA.1††	Excluded	Any mRNA	Documented infection	22 (-7- 44)	<150	~80 weeks
									29 (-2- 50)	≥150	
					Omicron BA.2, BA.4/5††				12 (-48-59)	<150	~55 weeks
									-55 (-79- -6)	≥150	
					Delta^				77 (69-82)	<150	~42 weeks
									66 (49-77)	≥150	
			Retrospective cohort		Omicron BA.1††				14 (-5-30)	<150	~80 weeks
									10 (-17-33)	≥150	
					Omicron BA.2, BA.4/5††				-16 (-60-43)	<150	~55 weeks
									-33 (-65-24)	≥150	
					Delta^				78 (72-83)	< 150	~42 weeks
									68 (52-78)	≥150	
414	Link-Gelles et al* (August 18, 2023)	USA	Test-negative case control	84,899 children aged ≥6 months to 4 years	Omicron BA.4/BA.5^	Included	BNT162b2	Emergency department and urgent care encounters	37 (19-51)	14+	~44 weeks
									46 (22-62)	14-59	
									27 (-2-47)	≥60	
				74,608 children aged ≥6 months to 5 years			mRNA-1273		29 (12 -42)	14+	
									46 (17-64)	14-59	
									21 (-1-38)	≥60	
413	Whitaker et al* (August 12, 2023)	United Kingdom	Retrospective cohort	3,376,300 Individuals in clinical rsisk groups + 7,198,900 in non-risk groups	Delta^	Included	AZD1222	Death	89.9 (86.1-92.6)	14-69	~44 weeks
									72.3 (67.6-76.4)	182+	
							BNT162b2	Death	95.5 (91.8-97.5)	14-69	~47 weeks
									81.7 (78.7-84.3)	182+	
							AZD1222	Hospitalization	92.5 (91.7-93.2)	14-69	~44 weeks
									68.7 (66.3-71.0)	182+	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								Hospitalization: immunsuprressed	76.6 (66.9-83.4)	14-69	
									62.1 (51.4-70.5)	182+	
							BNT162b2	Hospitalization	96.0 (95.1-96.7)	14-69	~47 weeks
									82.9 (81.4-84.2)	182+	
								Hospitalization: immunsuprressed	86.7 (76.8-92.4)	14-69	
									72.1 (64.1-78.3)	182+	
412	Franchi et al* (August 1, 2023)	Italy	Nested case control	9335 matched pairs of individuals ≥ 12 years of age in the Lombardy region	**Omicron BA.1, BA.2††**	Excluded	Any mRNA	Documented infection	18 (13-23)	14+	~72 weeks
					Delta^				81 (65-89)		~43 weeks
411	Rosa et al* (July 26,2023) **comparative VE (reference group = receipt of other primary series vaccines noted rather than unvaccinated persons)*	Brazil	Test-negative case control	4,547 individuals from Toledo region aged ≥12 years	**Omicron BA.1, BA.2^**	Included	BNT162b2	Symptomatic disease	46.7 (19.9-64.6)	7+	~70 weeks
									77.7 (54.8-89.4)	7-29	
									22.5 (-55.2-61.3)	≥180	
					Omicron BA.1^				58.2 (27.7-76)	7+	
					Omicron BA.2^				51.5 (-82.5-69.4)		
					Omicron BA.1, BA.2^		BNT162b2 vs. AZD1222*		25 (5-41)		
							BNT162b2 vs. CoronaVac*		33 (8-51)		
							BNT162b2 vs. Ad26.COV2.S*		14 (-52-51)		
410	Liu et al* (July 29, 2023) **comparative VE (reference group = receipt of BNT162b2 primary series 14-63 days prior rather than unvaccinated persons)*	Australia	Retrospective cohort	5923 adults (18+ y) residing in the Greater Sydney and Hunter New England areas of New South Wales	**Omicron BA.1, BA.2^**	Excluded	mRNA-1273 vs. BNT162b2	Documented infection	-3 (-30-18)*	14-63	7 weeks
							AZD1222 vs. BNT162b2		-19 (-49-5)*		
							NVX-CoV2373 vs. BNT162b2		-70 (-97 to -46)*		
					Omicron BA.2^		mRNA-1273 vs. BNT162b2		-15 (-62-18)*		
							AZD1222 vs. BNT162b2		1 (-51-35)*		
							NVX-CoV2373 vs. BNT162b2		-71 (-105 to -43)*		
409	Tamada et al* (July 22, 2023)	Japan	Test-negative case control		Delta^	Excluded	Any mRNA	Documented infection	89.1 (80.5–93.9)	14-34 days	~27 weeks
									73.1 (59.7–82.0)	≥56 days	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				16,180 individuals aged 20+ years				Hospitalization	81.8 (58.2–92.1)	14+	
							BNT162b2	Documented infection	78.2 (70.5–83.8)		
408	Cegolon et al* (July 14, 2023)	Italy	Retrospective cohort	8205 HCWs in the provinces of Trieste and Gorizia	**Omicron BA.1, BA.2, BA.5, BQ.1††**	Previously infected only	BNT162b2 or mRNA-1273 *Note: <1% of participants received Ad26.COV2.S, AZD1222, or NVX-CoV2373*	Documented infection	51 (37-62)	8+	~104 weeks
407	Meeraus et al* (June 30, 2023)	Austria, Belgium, Italy, and Spain	Test-negative case control	761 individuals aged 18+	Delta^	Included	AZD1222	Hospitalization due to severe acute respiratory infection	92.9 (−15.8- 99.6)	2-8 weeks	~43 weeks
									87.9 (−73.3 - 99.2)	>24 to ≤32 weeks	
					Omicron BA.1, BA.2, BA.5††				74.8 (−584.7- 99.1)	>16 to ≤24 weeks	~35 weeks
									46.9 (−693.3 - 96.5)	> 32 weeks	
					Alpha, Delta^				91 (-20.5-99.3)	14+	~22 weeks
					Delta^				64.6 (6.1-88.6)		~39 weeks
					Delta and Omicron BA.1^				62.6 (-51.7-90.8)	14+	~43 weeks
					Omicron BA.1, BA.2^				23.1 (-216.5-81.3)	14+	~56 weeks
406	Aglipay et al (June 28, 2023)	Canada	Test-negative case control	4039 children aged 6 months to 5 years in Ontario	**Omicron BA.5, BQ.1††**	Included	mRNA-1273	Symptomatic disease	90 (53-99)	7+	~12 weeks
								Hospitalization	82 (4-99)		
405	Lowthian et al* (June 22, 2023)	UK	Retrospective cohort	420,938 primary, middle, and secondary school students in Wales (aged 4-16 y)	**Omicron BA.1, BA.2††**	Included	BNT162b2	Documented infection: 4-11 y	87 (83-90)	0+	~13 weeks
					Delta, **Omicron BA.1, BA.2††**		Any mRNA	Documented infection: 11-16 y	64 (62-65)		~35 weeks
404	Spicer et al*	USA				Excluded		Documented infection	31.5 (24.6-37.7)	14-90	~35 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	(May 12, 2023)		Retrospective cohort	67,331 adolescents 12-17 years	Omicron BA.1^		BNT162b2 or mRNA-1273		1.3 (-2.4-4.9)	151+	
403	Wu et al* (January 9, 2024) *[Published version of June 2023 preprint]*	USA	Retrospective cohort/ Target trial emulation	111,539 children aged 5-11 years	Omicron BA.1, BA.2, BA.2.12.1, BA.5††	Excluded	BNT162b2	Documented infection	74.3 (72.2–76.2)	14+	~48 weeks
								Mild COVID-19	73.5 (69.2–77.1)		
								Moderate or severe disease	75.5 (69-81)		
								ICU admission	84.9 (64.8–93.5)		
				56,080 adolescents aged 12-20 years				Documented infection	85.5 (83.8–87.1)		~52 weeks
								Mild COVID-19	87 (83.5–89.8)		
								Moderate or severe disease	84.8 (77.3–89.9)		
								ICU admission	91.5(69.5–97.6)		
				77,392 adolescents aged 12-20 years	Delta^			Documented infection	98.4 (98.1–98.7)		~22 weeks
								Mild COVID-19	99.0 (98.5–99.3)		
								Moderate or severe disease	98.7 (97.4–99.3)		
								ICU admission	99 (92.5-99.9)		
402	Nogareda et al* (November 10, 2023) *[Update to June 15, 2023 preprint]*	Chile, Costa Rica, Ecuador, Guatemala, Paraguay, and Uruguay	Test-negative case control	15,241 patients (18+ y) hospitalized with SARI	Omicron BA.1, BA.2, BA.5††	Included	BNT162b2	Hospitalization due to SARI: 18-64 y	39.6 (10.7-59.2)	14+	~84 weeks
									49.3 (−8.9-76.4)	14-89	
									39.6 (−3.9-63.7)	>180	
								Hospitalization due to SARI: 65+ y	25.4 (−12.3-50.4)	14+	
									33.4 (−38.9-67.9)	90-180	
									3.4 (−49.1-37.4)	>180	
							AZD1222	Hospitalization due to SARI: 18-64 y	20.9 (−20.5-48.2)	14+	~72 weeks
									62.7 (22.7-82.0)	14-89	
									22.3 (−29.0-53.2)	90-180	
								Hospitalization due to SARI: 65+ y	38.9 (10.5-58.3)	14+	
									32.4 (−9.6-58.4)	90-180	
									69.3 (40.5-84.2)	>180	
							Sputnik V	Hospitalization due to SARI: 18-64 y	41.6 (−12.2-69.7)	14+	~76 weeks
								Hospitalization due to SARI: 65+ y	23.9 (−50.4-61.5)	14+	
							Covaxin	Hospitalization due to SARI: 65+ y	25.2 (−31.6-57.5)	14+	~76 weeks
							Coronavac	Hospitalization due to SARI: 18-64 y	1.3 (−43.4-32.0)	14+	~76 weeks
								Hospitalization due to SARI: 65+ y	25.1 (−4.7-46.4)	14+	
									29.9 (−34.7-63.5)	90-180	
									23.8 (−9.0-46.7)	>180	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
							BBIBP-CorV	Hospitalization due to SARI: 18-64 y	43.8 (−53.5- 79.4)	14+	~76 weeks
								Hospitalization due to SARI: 65+ y	40.7 (−19.9-70.6)	14+	
					Delta^		BNT162b2	Hospitalization due to SARI: 18-64 y	95.1 (87.2-98.1)	14+	~47 weeks
								Hospitalization due to SARI: 65+ y	85.4 (63.9-94.1)		
							mRNA-1273	Hospitalization due to SARI: 18-64 y	89.2 (68.5-96.3)		~21 weeks
								Hospitalization due to SARI: 65+ y	88.2 (66.2-95.9)		
							AZD1222	Hospitalization due to SARI: 18-64 y	80.1 (79.8-95.1)		~35 weeks
								Hospitalization due to SARI: 65+ y	77.9 (49.8-90.4)		
							Sputnik V	Hospitalization due to SARI: 18-64 y	81.5 (44.9-93.9)		~39 weeks
							Covaxin	Hospitalization due to SARI: 65+ y	77.2 (58.9-87.4)		~39 weeks
							CoronaVac	Hospitalization due to SARI: 65+ y	40.9 (−32.8-73.8)		~42 weeks
							BBIBP-CorV	Hospitalization due to SARI: 65+ y	71.8 (36.2-87.5)		~39 weeks
					Pre-Delta (Alpha, Beta, Gamma, Lambda, Mu, other non-VOC)^		BNT162b2	Hospitalization due to SARI: 18-64 y	70.1 (56.2-91.0)	14+	~34 weeks
								Hospitalization due to SARI: 65+ y	80.2 (61.3-89.9)		
							CoronaVac	Hospitalization due to SARI: 65+ y	33.5 (−63.3-73.0)		~29 weeks
							Covaxin	Hospitalization due to SARI: 65+ y	57.5 (21.7-76.9)		~26 weeks
401	Bozio et al* (February 18, 2023)	USA	Retrospective cohort	1,442,026 adults (18+ y)	**Omicron BA.1, BA.2^**	Excluded	Any mRNA	ED/UC encounter	18 (14-22)	14+	~73 weeks
									21 (12-28)	14-149	
									18 (14-22)	150+	
				1,442,080 adults (18+ y)				Hospitalization due to CLI	39 (33-44)	14+	
									39 (24-51)	14-149	
									39 (33-44)	150+	
				1,303,547 adults (18+ y)	Delta^			ED/UC encounter	72 (70-74)	14+	~49 weeks
									82 (79-84)	14-149	
									68 (65-70)	150+	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				1,303,559 adults (18+ y)				Hospitalization due to CLI	73 (70-75)	14+	
									85 (81-88)	14-149	
									69 (65-72)	150+	
399	Monteiro et al* (August 10, 2023) *[Published version of June 7, 2023 preprint]*	Brazil	Retrospective cohort/ Target trial emulation	324,302 individuals aged 60+ years	Gamma^	Excluded	CoronaVac	Hospitalization	55.8 (42.7-68.3)	14+	~30 weeks
								ICU admission	68.4 (42.3-86.4)		
								Death	82.3 (66.3-93.9)		
398	Ng et al* (May 26, 2023)	Hong Kong SAR	Test-negative case control	1781 cases and 1737 controls aged 3-105 years	**Omicron BA.2^**	Excluded	BNT162b2	Any infection	27 (4.2-44.5)	<180	~63 weeks
									20.9 (-4.3-39.9)	≥180	
							CoronaVac		22.9 (1.3-39.7)	<180	
									16.8 (-15.4-39.9)	≥180	
397	Yung et al* (May 15, 2023)	Singapore	Retrospective cohort	135,197 children and adolescents aged 5–17	**Omicron BA.4/5^**	Previously infected only	BNT162b2	Documented infection: 5-11 y	74 (67.7-79.1)	14+	~34 weeks
									67.9 (58.5-75.2)	14-119	
									78.7 (70.4-84.7)	180+	
								Documented infection: 12-17 y	84.9 (77-90.1)	14+	~68 weeks
				164,704 children and adolescents aged 5-17 years	**Omicron XBB^**			Documented infection: 5-11 y	62.8 (42.3-76)	14+	~47 weeks
								Documented infection: 12-17 y	57.9 (33.6-73.3)	14+	~82 weeks
396	Park et al* (May 15, 2023)	South Korea	Retrospective cohort	3,466,930 SARS-CoV-2 infections in persons aged ≥ 60 years	**Omicron BA.1 BA.2, BA.4/5^**	Included	Any mRNA	Death	72 (70-74)	14+	~80 weeks
							AZD1222		65 (62-68)		
							AZD1222 + any mRNA (heterologous)		55 (44-60)		
							Any mRNA	Critical infection	68 (67-69)		
							AZD1222		72 (70-74)		
							AZD1222 + any mRNA (heterologous)		61 (55-67)		
395	Langlete et al* (May 10, 2023)	Norway	Retrospective cohort	3,399,379 individuals aged 18-66 years	Delta^	Included	Any mRNA	Documented infection in HCWs	73.3 (70.6 – 75.8)	7-112	~43 weeks
									8.9 (-2.1 – 18.7)	225-336	
								Documented infection in non-HCWs	68.7 (67.7 – 69.7)	7-112	
									10.6 (-15.4 – 30.8)	225-336	
					Omicron BA.1^			Documented infection in HCWs	16.7 (10.5 – 22.4)	7-112	~54 weeks
									9.7 (2.3 – 16.6)	225-336	
								Documented infection in non-HCWs	-32.6 (-35.6 - -29.7)	7-112	
									-29.8 (-37.9 - -22.2)	225-336	
394	Surie et al * (June 29, 2023)	USA	Test-negative case control	2,952 adults aged 18+	**Omicron BA.1 BA.2, BA.4/5^**	Included	Any mRNA (ascertained by	Hospitalization	20 (3-34)	14+	~82 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	[Update to May 5, 2023 preprint]						Electronic Medical Records)				
							Any mRNA (ascertained by Immunization Information System)		32 (16-45)		
393	Finci et al* (October 12, 2023) *[Published version of May 5, 2023 preprint]*	Albania	Prospective cohort	1462 HCWs aged 20 years and above	**Omicron BA.1, BA.2^**	Included	BNT162b2	Any infection	17 (-38-50)	14+	~65 weeks
								Symptomatic infection (PCR only)	26 (-53-64)		
								Symptomatic infection (PCR and RAT)	33 (-32-66)		
392	Yan et al* (May 3, 2023)	Hong Kong SAR	Case control	49,334 cases and 499,436 controls among adults (18+ y)	**Omicron BA.2††**	Excluded	BNT162b2	Hospitalization	73 (69.2-76.3)	14-30	~32 weeks
									46.6 (40.7-51.8)	211-240	
								Severe disease	69.7 (50-81.6)	14-30	
									71.8 (47.2-84.9)	211-240	
								Death	89.8 (83.7-93.6)	14-30	
									73.8 (55.9-84.4)	211-240	
							CoronaVac	Hospitalization	66 (63.5-68.3)	14-30	
									36.2 (28-43.4)	211-240	
								Severe disease	54.5 (40.6-65.1)	14-30	
									67.1 (34-83.6)	211-240	
								Death	81.1 (77.4-84.2)	14-30	
									76.6 (60.8-86)	211-240	
391	Huang et al* (May 1, 2023)	Hong Kong SAR	Case control	10,366 cases matched to 35,676 controls with substance use disorder (aged 18+)	**Omicron BA.1, BA.2††**	Excluded	BNT162b2	Any infection	20.7 (14-27)	14-180	~24 weeks
								Hospitalization	73.3 (64.3-80)	14+	~60.5 weeks
							CoronaVac	Any infection	6.1 (-0.5-12.3)	14-180	~24 weeks
								Hospitalization	59.9 (50.2-67.7)	14+	~59.5 weeks
390	Qassim et al* (July 19, 2023) *[Published version of April 29, 2023 preprint]*	Qatar	Test-negative case control	539,093 matched pairs of individuals (all ages)	**Omicron BA.2.75/XBB^**	Included	Any mRNA	Any infection: Sep 2022	-5.8 (-11.1 to -0.3)	14+ (median 459)	~87 weeks
								Any infection: Nov 2022	-2.1 (-10.5-6.7)	14+ (median 541)	~96 weeks
					Omicron BA.4/5 & BA.2.75/XBB^			Severe, critical, or fatal disease: Aug-Nov 2022	53.1 (-41.3-87.1)	14+ (median 453)	~96 weeks
					Omicron BA.4/5^			Any infection: Jun 2022	-20.7 (-26.7 to -14.2)	14+ (median 389)	~74 weeks
								Any infection: Aug 2022	-1.1 (-7.1-5.1)	14+	~83 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
										(median 432)	
					Omicron BA.1/2^ & BA.4/5^			Severe, critical, or fatal disease: May-Jul 2022	83.8 (14.1-96.9)	14+ (median 425)	~78.5 weeks
					Omicron BA.1/2^			Any infection: Dec 2021	-3.9 (-7.8-0)	14+ (median 228)	~48 weeks
								Any infection: May 2022	-1.6 (-14.7-11.9)	14+ (median 364)	~70 weeks
								Severe, critical, or fatal disease: Feb-Apr 2022	81.4 (48.5-93.3)	14+ (median 254)	~65 weeks
					Delta^			Any infection: Jun 2021	80.7 (77.2-83.7)	14+ (median 64)	~22 weeks
								Any infection: Nov 2021	52.7 (46.5-58.2)	14+ (median 209)	~44 weeks
								Severe, critical, or fatal disease: Aug-Oct 2021	91.4 (86.6-94.5)	14+ (median 189)	~39.5 weeks
					Beta^			Any infection: Mar 2021	81.8 (79.8-83.6)	14+ (median 34)	~9 weeks
								Any infection: May 2021	80.9 (78.4-83.1)	14+ (median 48)	~17.5 weeks
					Alpha/Beta^			Severe, critical, or fatal disease: Feb-Apr 2021	95.4 (93.6-96.7)	14+ (median 49.5)	~13 weeks
					Alpha^			Any infection: Feb 2021	84.5 (77.8-89.2)	14+ (median 24)	~4.5 weeks
389	DeCuir et al (April 28, 2023)	USA	Test-negative case control	4,421 immuno-competent adults aged ≥18 years	Omicron BA.1, BA.2, BA.4/5, BQ.1^	Included	Any mRNA primary	Invasive mechanical ventilation and death	53 (37-65)	7+	62 weeks
									50 (32-64)	180+	
388	Braeye et al* (April 5, 2023)	Belgium	Retrospective cohort	Females aged 45-64 among 413,363 index cases and 703,057 close contacts	Omicron BA.1^	Excluded	BNT162b2	Documented infection in close contact of unvaccinated index case	3 (1-5)	7-57	~28.5 weeks
									2 (0-3)	157-207	
							mRNA-1273		4 (1-7)	14-64	
									3 (0-4)	164-214	
							AZD1222		2 (0-4)	14-64	
									1 (0-2)	164-214	
							Ad26.COV2.S		1 (0-2)	21-71	
									1 (0-2)	171-221	
					Delta^		BNT162b2		62 (56-66)	7-57	
									43 (41-45)	157-207	
							mRNA-1273		75 (70-77)	14-64	
									56 (54-58)	164-214	
							AZD1222		48 (43-55)	14-64	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
									35 (34-38)	164-214	
							Ad26.COV2.S		28 (26-31)	21-71	
									27 (23-30)	171-221	
387	Altarawneh et al* (July 27, 2023) *[Update to April 22, 2023 preprint]*	Qatar	Test-negative case control	303,258 individuals (all ages)	Alpha^	No prior infection	BNT162b2	Symptomatic infection	90.5 (83.9 -94.4)	14+	~8 weeks
								Severe, critical, or fatal disease	96.1 (71.2-99.5)		
					Beta^			Symptomatic infection	80.5 (79-82)		~17 weeks
								Severe, critical, or fatal disease	97.4 (95.8-98.4)		
							mRNA-1273	Symptomatic infection	96 (91.6-98.1)		
								Severe, critical, or fatal disease	100 (92.2-100)		
					Delta^		BNT162b2	Symptomatic infection	58.1 (54.6 - 61.3)		~48 weeks
								Severe, critical, or fatal disease	91.1 (86.3 - 94.2)		
							mRNA-1273	Symptomatic infection	71 (66.4-74.9)		
								Severe, critical, or fatal disease	97.9 (91.2-99.5)		
386	Huang et al* (April 12, 2023)	China	Retrospective cohort	1,556,972 vaccinated and 1,556,972 unvaccinated individuals 60+ years	Alpha, Delta and Omicron BA.1, BA.2^	Partially excluded (excluded if prior infection prior to study start)	CoronaVac	Severe disease	65.5 (50.9-75.7)	8+	~66 weeks
								Death	80.4 (55.8-91.3)		
							BBIBP-CorV	Severe disease	76.4 (61.8-85.4)		
								Death	82.7 (53.4-93.6)		
385	Klein et al* (April 7, 2023)	USA	Test-negative case control	80,032 ED/UC encounters and 2917 hospitalizations among children and adolescents aged 5-17	**Omicron BA.1, BA.2, BA.4/5^**	Included	BNT162b2	ED/UC visit: 5-11 y	49 (33-61)	14-59	~31 weeks
									41 (29-51)	150+	
								ED/UC visit: 12-15 y	64 (44-77)	14-59	~62 weeks
									13 (3-23)	150+	
								ED/UC visit: 16-17 y	31 (10-47)	60-149	~72 weeks
									7 (-8-20)	150+	
					Delta^			ED/UC visit: 12-15 y	93 (89-95)	14-59	~22 weeks
									77 (69-84)	150+	
								ED/UC visit: 16-17 y	93 (86-97)	14-59	~32 weeks
									72 (63-79)	150+	
								Hospitalizaiton: 12-15 y	98 (21-100)	14-59	~22 weeks
									97 (74-100)	60-149	
								Hospitalization: 16-17 y	99 (90-100)	60-149	~32 weeks
									98 (73-100)	150+	
384	Lutz et al*	USA				Included	BNT162b2 or	Hospitalisation	93.9 (85.7-97.4)	14+	~45 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	(March 27, 2023)		Test-negative case control	207 cases and 267 controls: Alaska natives and American Indians aged 12 years and older	Alpha and Delta^			Outpatient clinic/Emergency visit	85.9 (60-95)		
							mRNA-1273	Hospitalisation	97.3 (88.3-99.4)		
								Outpatient clinic/Emergency visit	85.4 (39.3-96.5)		
							BNT162b2 or mRNA-1273	Hospitalization	96.2 (94-99.4)	14-149	
									87.7 (69.4-95)	≥150	
								Outpatient clinic/Emergency visit	87.7 (60.5-96.2)	14-149	
									87 (55.6-96.2)	≥150	
383	Lipschuetz et al* (March 23, 2023)	Israel	Retrospective cohort	48,868 infants up to 120 days old	Delta and Omicron BA.1^	Excluded	BNT162b2 in mothers during pregnancy	Hospitalization up 120 days after birth	-16 (-56-14)	≥ 5 months	~59 weeks
382	Bouillon et al* (June 13, 2022)	France	Retrospective cohort	22,513,664 adults aged ≥50 years	Alpha, Delta^	Included	BNT162b2	Hospitalization	90 (88-91)	14-30	~28 weeks
									94 (92-94)	152-180	
								Death	91 (90-93)	14+	
							mRNA-1273	Hospitalization	92 (85-95)	14-30	~28 weeks
									98 (93-100)	152-180	
								Death	96 (92-98)	14+	
							AZD1222	Hospitalization	94 (88-97)	14-30	~23 weeks
									90 (63-97)	90-120	
								Death	88 (68-95)	14+	
381	Rojas-Botero et al* (September 8, 2023) *[Published version of March 22, 2023 preprint]*	Colombia	Retrospective cohort	5,709,210 matched paris of adults aged 18+ years	Mu, Delta, and Omicron^	Included	BNT162b2	Hospitalization	90.5 (89.8-91.2)	15+	~64 weeks
								Death	93.5 (92.8-94.2)		
							mRNA-1273	Hospitalization	93.7 (91.8-95.2)		~41 weeks
								Death	95.7 (93.5-97.2)		
							AZD1222	Hospitalization	88 (86.8-89.1)		~57 weeks
								Death	92.6 (91.5-93.6)		
							CoronaVac	Hospitalization	77.4 (76.5-78.2)		~64 weeks
								Death	81.9 (81.2-82.7)		
							Ad26.COV2.S	Hospitalization	85.4 (83.8-86.9)		~51 weeks
								Death	90.5 (88.8-91.9)		
380	Tamandjou Tchuem et al* (February 27, 2023)	France	Test-negative case control	273,732 cases and 735,919 controls among adults aged 50+ y	**Omicron BA.1^**	Included	BNT162b2 or mRNA-1273	Symptomatic disease	69.8 (58.3-79.3)	8-30	~54 weeks
									19.9 (16.3-24.1)	>120	
					Delta				85.9 (75.2-92.4)	8-30	~45 weeks
									60.1 (57.2-63)	>120	
378	Glatman-Freedman et al* (March 2, 2023)	Israel	Test-negative case control	78,541 matched pairs of children 5-11 years	**Omicron BA.1^**	Excluded	BNT162b2	Documented infection	58.1 (55.5-60.6)	8-14	4 weeks
									39.5 (36.1-42.8)	36-42	
376	Yan et al* (February 28, 2023)	Hong Kong, SAR	Case control	40,583 cases and 149,615		Excluded	BNT162b2	Documented infection	39.7 (29-48.7)	14-60	~68 weeks
									16.5 (8.7-23.6)	≥180	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				controls among children aged 3-17 years	**Omicron BA.1, BA.2, BA.4, BA.5^**			Hospitalization	45.5 (-0.2-70.3)	14-60	
									33.6 (5.5-53.3)	≥180	
								Severe disease	67.3 (34.1-83.8)	14-60	
									29.2 (-4.9-52.2)	≥180	
							CoronaVac	Documented infection	29.5 (20.1-37.7)	14-60	
									-35.2 (-63.3- -12)	121-179	
								Hospitalization	55.8 (34.9-70)	14-60	
									-66.9 (-137.3- -17.3)	121-179	
								Severe disease	57.6 (32.8-73.2)	14-60	
									-48.8 (-120- -0.7)	121-179	
375	Jorgensen et al* (February 27, 2023)	Canada	Test-negative case control	2787 infants of mothers vaccinated post-partum	**Omicron BA.5^**	Included	BNT162b2 or mRNA-1273 in mothers received post partum	Documented infection	13 (-14-33)	14+	~66 weeks
								Hospitalization	36 (-21-66)		
					Delta^			Documented infection	73 (72-87)		
374	Bello Chavolla et al* (February 10,2023) *[Published version of February 02,2023 preprint]*	Mexico	Test-negative case control	1,585,825 adults aged ≥18 years	Alpha and Delta^	Excluded	BNT162b2	Documented infection	80.3 (80.1-80.6)	14+	~35 weeks
								Hospitalization	84.3 (83.6-84.9)		
								Death	89.8 (89.1-90.4)		
							mRNA-1273	Documented infection	91.5 (90.3-92.4)		~1 week
								Hospitalization	78 (69.0-84.4)		
								Death	93.5 (85.9-96.9)		
							AZD1222	Documented infection	80.8 (80.4-81.1)		~32 weeks
								Hospitalization	80.2 (79.3-81.1)		
								Death	86.8 (85.9-87.7)		
							Ad26.COV2.S	Documented infection	82.2 (81.4-82.9)		~11 weeks
								Hospitalization	77.3 (72.9-81.0)		
								Death	85.8 (80.1-89.9)		
							Ad5-nCoV	Documented infection	70.5 (70.1-70.9)		~27 weeks
								Hospitalization	72.3 (71.1-73.5)		
								Death	79.9 (78.5-81.2)		
							CoronaVac	Documented infection	71.9 (71.4-72.5)		~27 weeks
								Hospitalization	73.8 (72.5-75.0)		
								Death	80.4 (79.0-81.6)		
							Gam-COVID-Vac	Documented infection	78.8 (78.2-79.3)		~26 weeks
								Hospitalization	81.4 (79.5-83.1)		
								Death	87.7 (85.8-89.3)		
373	Huang et al* (August 31, 2023)	Taiwan	Test-negative case control	162,219 adults aged ≥20 years	**Omicron BA.1, BA.2, BA.4/BA.5^**	Included	MVC-COV1901	Documented infection	38.3 (32.6-43.5)	14+	~52 weeks
								Moderate to severe disease	79.6 (56.7-90.4)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	[Update to February 1, 2023 preprint]										
372	Weng et al* (February 1,2023)	USA	Retrospective cohort	38,602 individuals aged ≥12 years	Alpha^	Included	BNT162b2	Documented infection	94.6 (83.4-98.3)	14+	~48 weeks
							mRNA-1273		97.5 (82.5-99.7)		
					Delta^		BNT162b2		64.8 (54.2-73)		
							mRNA-1273		65 (52.9-74.1)		
					Omicron BA.1^		BNT162b2		31.6 (19.6-42.5)		
							mRNA-1273		25.6 (10.7-39)		
371	Sritipsukho et al* (January 30,2023)	Thailand	Test-negative case control	7,971 adults aged ≥18 years	**Omicron BA.1^ , BA.2^**	Excluded	CoronaVac	Documented infection	26 (-9-50)	14+	~67 weeks
									47 (7-70)	≤90 days	
									21 (-15-47)	>90 days	
								Moderate to critical disease	-4 (-50-45)	14+	
							AZD1222	Documented infection	38 (13-56)	14+	
									61 (41-74)	≤90 days	
									30 (0-51)	>90 days	
								Moderate to critical disease	56 (25-74)	14+	
							BNT162b2	Documented infection	23 (-13-49)	14+	
									38 (4-60)	≤90 days	
									-38 (-60-24)	>90 days	
								Moderate to critical disease	30 (-37-69)	14+	
370	Tartof et al* (January 28, 2023)	USA	Test-negative case control	1992 matched pairs of children aged 5-11 with ARI in Southern California	**Omicron BA.1, BA.2, BA.4/BA.5^**	Included	BNT162b2	Emergency dept/ Urgent care encounter	60 (47-69)	14-89	~39 weeks
									28 (8-43)	90+	
					Delta^				85 (59-95)		~5 weeks
369	Toh et al* (January 27, 2023)	Malaysia	Test-negative case control	310 hospitalized adults (aged 18+) with SARI in Sibu and Selangau districts	Non-VOC, Delta^	Included	CoronaVac	Hospitalization	76.5 (45.6-89.8)	15+	~24 weeks
368	Niesen et al* (April 28, 2022)	USA	Test-negative case control	59,685 individuals aged ≥18 years	Delta^	Excluded	BNT162b2	Symptomatic disease	80.6 (76.9-83.7)	14-73	~54 weeks
									43.3 (28.8-54.7)	314-355	
				28,951 individuals aged ≥18 years			mRNA-1273		94.8 (88-97.8)	7-13	
									63.2 (53.7-70.7)	254-313	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
367	Ellingson et al* (January 26, 2023)	USA	Prospective cohort	1530 frontline workers with prior infection	Omicron^	Prior infection only	BNT162b2 or mRNA-1273	Documented infection	43 (25-57)	14+	~63 weeks
366	Battacharya et al (January 6, 2023)	India	Test-negative case-control	1,614 persons aged 18+ years hospitalized with symptoms of pulmonary disease	Delta††	Included	BBV152	Hospitalization with symptoms of pulmonary disease	74.0 (50.5-86.0)	7+	~22 weeks
							AZD1222 (Covishield)		79.0 (53.1-81.0)		~22 weeks
365	Lin et al* (June 16, 2023) *[Update to Jan 19, 2023 preprint]* *Note: this study includes additional VE estimates for individuals vaccinated during different time periods.*	USA	Retrospective cohort	1,368,721 children <12 y in North Carolina	Omicron (all lineages)^	Included	mRNA-1273	Documented infection: 0-4 y	58 (47.5-66.5)	0 to ~4 weeks	~23 weeks
									47.6 (27.7-62)	~16-21 weeks	
							BNT162b2 or mRNA-1273	Hospitalization or death: 5-11 y	73.3 (8.3-92.3)	0 to ~5 weeks	~57 weeks
									2.9 (-50.8-37.4)	~20-25 weeks	
						Prior infection only	BNT162b2 or mRNA-1273	Documented infection: 0-4 y	37.5 (21.2-50.4)	0 to ~5 weeks	~24 weeks
									46.8 (-0.3-71.8)	~16-21 weeks	
								Documented infection: 5-11 y	65.3 (58.1-71.2)	0 to ~5 weeks	~57 weeks
									4.6 (-2.1-10.9)	~24-29 weeks	
						Excluded	BNT162b2 or mRNA-1273	Documented infection: 0-4 y	55.7 (49.1-61.5)	0 to ~5 weeks	~24 weeks
									58.6 (48.3-66.9)	~16-21 weeks	
								Documented infection: 5-11 y	59.7 (58.3-61)	0 to ~5 weeks	~57 weeks
									16 (13.1-18.7)	~36-41 weeks	
364	Heidarzadeh et al* (December 23, 2022)	Iran	Test-negative case control	42,084 persons aged 5+ y in Guilan Province	Alpha, Delta^	Included	AZD1222	Hospitalization (moderate)	97 (75-99.5)	31-60	~23 weeks
									93 (69-99)	91-120	
								Hospitalization (severe)	87 (80-92)	31-60	
									90 (51-98)	151+	
								ICU admission	57 (-41-87)	31-60	
									12 (-113-63)	91-120	
								Death	80 (48-92)	31-60	
									92 (48-99)	121-150	
							BBIBP-CorV	Hospitalization (moderate)	78 (69-84)	31-60	~36 weeks
									95 (67-99.4)	151+	
								Hospitalization (severe)	71 (68-75)	31-60	
									85 (77-91)	151+	
								ICU admission	25 (-9-48)	31-60	
									26 (-77-69)	151+	
								Death	41 (23-55)	31-60	
									33 (-40-69)	151+	
							BIV1-CovIran	Hospitalization (moderate)	96 (68-99.4)	31-60	~21 weeks
									97 (76-99.6)	61-90	
								Hospitalization (severe)	82 (73-88)	31-60	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
									92 (86-96)	91-120	
								ICU admission	61 (-61-91)	31-60	
									35 (-116-80)	91-120	
								Death	88 (48-97)	31-60	
									93 (46-99)	91-120	
							Covaxin	Hospitalization (severe)	55 (-33-85)	61-90	~35 weeks
									96 (68-99.5)	151+	
								Death	4 (-671-79)	91-120	
							Sputnik V	Hospitalization (moderate)	74 (-9-94)	31-60	~40 weeks
									95 (79-99)	151+	
								Hospitalization (severe)	62 (32-78)	31-60	
									93 (88-96)	151+	
								ICU admission	51 (-258-94)	91-120	
									18 (-136-71)	151+	
								Death	25 (-149-78)	31-60	
									93 (47-99.1)	151+	
363	Alkadi et al* (December 26, 2022)	Qatar	Test-negative case control	782 adults (aged 18+) on chronic hemodialysis	Non-VOC, Alpha, Delta††	Unknown	BNT162b2	Documented infection	94.3 (89-97)	14+	~48 weeks
							mRNA-1273		98.2 (88.6-99.9)		~40 weeks
362	Villar et al* (January 17, 2023)	Multiple	Prospective cohort	4618 pregnant women from 41 hospitals across 18 countries	Omicron^	Included	BNT162b2 or mRNA-1273	Documented infection	11 (0-21)	0+	~74.5 weeks
								Moderate disease	41 (22-55)		
								Severe disease or death	56 (27-74)		
361	Tartof et al (January 11, 2023)	USA	Test-negative case control	1577 patients aged 18+ with COVID-like illness	Omicron^	Excluded	BNT162b2 or mRNA-1273 *Note: Includes some who received 3 doses <7 days prior*	Symptomatic disease	-53 (-205-23)	14+	~64.5 weeks
						Prior infection only			45 (-4-70)		
					Delta^	Excluded			70 (11-90)		~46.5 weeks
						Prior infection only			23 (-225-82)		
					Omicron or Delta^	Excluded			17 (-40-51)		~64.5 weeks
						Prior infection only			42 (-1-66)		
360	Peebles et al* (January 10, 2023)	USA	Retrospective cohort	7763 LTCF staff aged <65 y in New York City	Non-VOC, Alpha^	Excluded	BNT612b2	Documented infection	80 (67.6-87.7)	14+	~17 weeks
								Symptomatic disease	87.5 (69.4-94.9)		
								Asymptomatic infection	68.9 (36-84.9)		
359	Jang et al* (January 9, 2023)	South Korea	Retrospective cohort		Omicron^	Unknown	BNT162b2	Documented infection	57.6 (51.6-62.8)	15-30	~11 weeks
									46.9 (43.7-49.9)	31-60	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				3,062,281 children aged 5-11					41.2 (34.3-47.4)	61-90	
								ICU admission or death	100 (100-100)	15-30	
									100 (100-100)	31-60	
									100 (100-100)	61-90	
358	Dalton et al* (January 6, 2023)	USA	Test-negative case control	191,085 ED/UC encounters and 43,657 hospital encounters among adults aged 18+	Omicron BA.1^	Included	BNT162b2 or mRNA-1273	ED/UC visit: Social Vulnerability Index (SVI) Quartile 1 (Q1)	47 (40-53)	14-149	~62 weeks
									35 (31-40)	150+	
								Hospitalization: SVI Q1	59 (39-72)	14-149	
									58 (51-65)	150+	
								ED/UC visit: SVI Q2	42 (33-49)	14-149	
									37 (32-41)	150+	
								Hospitalization: SVI Q2	65 (48-76)	14-149	
									57 (49-64)	150+	
								ED/UC visit: SVI Q3	54 (47-61)	14-149	
									31 (25-36)	150+	
								Hospitalization: SVI Q3	62 (45-74)	14-149	
									55 (47-63)	150+	
								ED/UC visit: SVI Q4	51 (43-58)	14-149	
									27 (20-33)	150+	
								Hospitalization: SVI Q4	63 (43-75)	14-149	
									43 (32-52)	150+	
					Delta^		BNT162b2 or mRNA-1273	ED/UC visit: SVI Q1	87 (84-89)	14-149	~48.5 weeks
									81 (79-82)	150+	
								Hospitalization: SVI Q1	90 (84-94)	14-149	
									85 (82-87)	150+	
								ED/UC visit: SVI Q2	85 (81-88)	14-149	
									80 (77-81)	150+	
								Hospitalization: SVI Q2	91 (85-95)	14-149	
									86 (83-88)	150+	
								ED/UC visit: SVI Q3	89 (85-91)	14-149	
									74 (71-77)	150+	
								Hospitalization: SVI Q3	94 (88-97)	14-149	
									82 (78-85)	150+	
								ED/UC visit: SVI Q4	84 (79-87)	14-149	
									75 (72-78)	150+	
								Hospitalization: SVI Q4	90 (83-94)	14-149	
									84 (80-87)	150+	
357	Lewis et al* (December 31, 2022)	USA	Test-negative case control	2060 hospitalized	Omicron BA.1/2^	Included	BNT162b2 or mRNA-1273	Hospitalization	46 (30-58)	150+	~63 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				patients aged 18+			*Note: Includes some who received a booster dose <7 days prior*				
							Ad26.COV2.S *Note: Includes some who received a booster dose <7 days prior*		36 (-4-60)	60+	~55 weeks
356	Horne et al (January 5, 2023)	UK	Retrospective cohort	6,498,786 adults aged 18+ in England	Alpha, Delta, Omicron^	Excluded	BNT162b2 (ages 18-39)	Documented infection	75 (74-76)	21-48	~45 weeks
									-83 (-294-15)	245-272	
								Hospitalization	96 (93-97)	21-48	
									-48 (-217-31)	245-272	
							AZD1222 (ages 40-64)	Documented infection	22 (19-25)	21-48	~36 weeks
									41 (-47-77)	301-328	
								Hospitalization	95 (93-96)	21-48	
									44 (-41-78)	301-328	
								Death	99 (96-100)	77-104	
									74 (36-89)	217-244	
							BNT162b2 (ages 18-64 and clinically vulnerable)	Documented infection	78 (73-82)	21-48	~48 weeks
									28 (-41-63)	329-356	
								Hospitalization	97 (92-99)	21-48	
									28 (-38-62)	329-356	
								Death	96 (92-98)	105-132	
									37 (-36-70)	245-272	
							AZD1222 (ages 18-64 and clinically vulnerable)	Documented infection	26 (20-33)	21-48	
									14 (-42-48)	329-356	
								Hospitalization	93 (89-96)	21-48	
									21 (-30-52)	329-356	
								Death	96 (87-99)	49-76	
									50 (-125-89)	301-328	
							BNT162b2 (ages 65+)	Documented infection	77 (67-84)	21-48	
									4 (-30-29)	329-356	
								Hospitalization	92 (86-95)	21-48	
									2 (-34-27)	329-356	
								Death	97 (92-99)	21-48	
									33 (-49-70)	329-356	
								Documented infection	47 (29-61)	21-48	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
							AZD1222 (ages 65+)		-12 (-54-18)	329-356	
								Hospitalization	86 (75-92)	21-48	
									-12 (-53-18)	329-356	
								Death	93 (84-97)	49-76	
									23 (-82-68)	329-356	
354	Carazo et al* (July 14, 2023) *[Published version of December 27, 2022]*	Canada	Test-negative case control	174,819 older adults aged 60+ in Quebec	**Omicron BA.1^**	Excluded	BNT162b2 or mRNA-1273	Hospitalization	78 (75-80)	7+	~60 weeks
									86 (78-91)	7-90	
									68 (37-84)	270-359	
					Omicron BA.2^				60 (50-67)	7+	~73 weeks
									66 (28-84)	7-90	
									73 (-13-94)	360-449	
					Omicron BA.4/5^				40 (30-49)	7+	~94 weeks
									55 (-95-89)	7-90	
									47 (35-57)	360-449	
					Omicron BA.1^	Pre-Omicron prior infection	BNT162b2 or mRNA-1273	Hospitalization	97 (96-99)	7+	~60 weeks
					Omicron BA.2^	Pre-Omicron prior infection			92 (86-96)		~73 weeks
						Omicron prior infection			99 (94-100)		
					Omicron BA.4/5^	Pre-Omicron prior infection			92 (80-97)		~94 weeks
						Omicron prior infection			91 (85-95)		
353	Nittayasoot et al* (December 12, 2022)	Thailand	Test-negative case control	1015 cases and 2,406,762 controls aged 18+	Delta^ and **Omicron BA.1, BA.2^**	Included	BBIBP-CorV	Pneumonia requiring invasive ventilation	65.8 (39.4-80.7)	14+	~54 weeks
							AZD1222		58.4 (39.9-71.2)		
							BNT162b2		71.7 (49.7-84.1)		
							CoronaVac+ AZD1222		71.7 (63.2-78.2)		
							CoronaVac + BNT162b2		79.7 (7.3-95.6)		
							AZD1222+ BNT162b2		83.1 (62.3-92.4)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
352	Khanam et al* (December 2, 2022)	Bangladesh	Test-negative case control	313 cases and 1,196 controls aged 18+	Delta^	Excluded	ChAdOx1 nCoV-19	Symptomatic disease	-45 (-119-4)	14+	~36 weeks
									3 (-129-59)	≤19 weeks	
									-35 (-112-14)	>19 weeks	
								Death	86 (-23-98)	14+	
							Sinopharm	Symptomatic disease	29 (-22-58)	14+	
									34 (-16-62)	≤19 weeks	
									-36 (-886-81)	>19 weeks	
								Death	75 (-124-97)	14+	
							mRNA-1273	Symptomatic disease	64 (10-86)	14+	
351	Cegolon et al* (November 30, 2022)	Italy	Retrospective cohort	7723 HCWs aged 18+	**Omicron BA.1, BA.2, BA.4/BA.5^**	Excluded	BNT162b2 or mRNA-1273	Documented infection	41 (-49-77)	7+	~69 weeks
						Previously infected only			-4 (-43-24)		
350	Fu et al* (September 22, 2023) *[Published version of December 10, 2022 preprint]*	USA	Retrospective cohort	10,412,853 adults aged 18+	**Omicron BA.1, BA.2††**	Included	BNT162b2	Documented infection	-122.3 (-124.2 to -120.3)	14+	~75.5 weeks
							mRNA-1273		-163.5 (-166.6 to -160.5)		~73.5 weeks
							Heterologous mRNA		-19 (-27.4 to -11)		~75.5 weeks
							Ad26.COV2.S		-38.1 (-44.2 to -32.2)		~69.5 weeks
					Delta^		BNT162b2	Documented infection	-25 (-26.2 to -23.8)		~48.5 weeks
							mRNA-1273		-11.3 (-12.9 to -9.8)		~46.5 weeks
							Heterologous mRNA		-13.6 (-22.7 to -5.2)		~48.5 weeks
							Ad26.COV2.S		33.0 (29.2-36.5)		~42.5 weeks
					Pre-Delta^		BNT162b2	Documented infection	77.9 (77.2-78.5)		~23 weeks
							mRNA-1273		85.9 (85.1-86.5)		~21 weeks
							Heterologous mRNA		78.9 (66.6-87.7)		~23 weeks
							Ad26.COV2.S		81.4 (78.4-84.2)		~17 weeks
					Pre-Delta, Delta, Omicron^		BNT162b2	Documented infection	47.3 (46.0-48.5)	1st month	~
									-77 (-80.6 to - 73.5)	6th month	
							mRNA-1273		64.7 (63.3-66)	1st month	
									-62.6 (-67.2 to -58.1)	6th month	
							Heterologous mRNA		-35.5 (-48.6 to -23.6)	1st month	
									-4.2 (-27.4 - 14.8)	6th month	
							AD26.COV2.S		30.8 (23.5-37.4)	1st month	
									-1.2 (-13.2 - 9.5)	6th month	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
349	Castelli et al* (November 30, 2022)	Argentina	Test-negative case control	139,321 matched pairs of children and adolescents (3-17 y)	Omicron^	Included	BNT162b2 (12-17 y)	Documented infection	28.1 (25.2-30.8)	14+	~32.5 weeks
							mRNA-1273 (12-17 y)		17.9 (14-21.5)	14+	
							BNT162b2 + mRNA-1273 (12-17 y)		40.6 (29.4-50)	14+	
							mRNA-1273 + BNT162b2 (12-17 y)		31.5 (26.3-36.4)	14+	
							Any mRNA (12-17 y)	Documented infection	55.8 (52.4-59)	15-30	
									12.4 (8.6-16.1)	61+	
								Death	97.6 (81-99.7)	14+	
							BBIBP-CorV (3-11 y)	Documented infection	26 (23.2-28.8)	14+	~22.5 weeks
									37.6 (34.2-40.8)	15-30	
									2 (1.8-5.6)	61+	
								Death	66.9 (6.4-89.8)	14+	
					Delta^		BNT162b2 (12-17 y)	Documented infection	64.1 (60.5-67.3)	14+	~15.5 weeks
							mRNA-1273 (12-17 y)	Documented infection	70.2 (66.8-73.1)		
							BNT162b2 + mRNA-1273 (12-17 y)	Documented infection	88.9 (66.1-96.4)		
							mRNA-1273 + BNT162b2 (12-17 y)	Documented infection	66.3 (54-75.4)		
							Any mRNA (12-17 y)	Documented infection	74.8 (71.3-77.9)	15-30	
									56.3 (50.2-61.7)	61+	
							BBIBP-CorV (3-11 y)	Documented infection	61.2 (56.4-65.5)	14+	~5.5 weeks
									68.4 (64.1-72.2)	15-30	
									65.2 (44-78.4)	61+	
348	Turbyfill et al* (November 15, 2022)	USA	Test-negative case control	5,811 adults aged 18+	Alpha and Delta^	Included	BNT162b2 or mRNA-1273	Hospitalization in immunocompetent adults	91 (88-93)	14+	~30 weeks
									84 (80-88)		
								Hospitalization in immunosuppressed adults	64 (48-75)		
									53 (22-72)		
346	Jorgensen et al*	Canada			Omicron^	Included		Documented infection	45 (37-53)	14+	~66 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	(February 8,2023) *[Published version of November 8,2022 preprint]*		Test-negative case control	8,809 infants less than 6 months			BNT162b2 or mRNA-1273 in mothers	Documented infection, second dose given in first trimester	47 (31-59)		
								Documented infection, second dose given in second trimester	37 (24-47)		
								Documented infection, second dose given in third trimester	53 (42-62)		
								Documented infection in infants aged 0-8 weeks	57 (44-66)		
								Documented infection in infants aged 9-16 weeks	47 (31-60)		
								Documented infection in infants aged >16 weeks	40 (21-54)		
								Hospitalization	58 (44-69)		
					Delta^	Excluded		Documented infection	95 (88-98)		~28 weeks
								Hospitalization	97 (74-100)		
345	Clemens et al* (October 13, 2022)	Brazil	Test-negative case control	7958 PCR tests among adults aged 18-60 in Botucatu	Delta specifically^	Included	AZD1222	Documented infection	76 (49.5-87.8)	14+	~12.5 weeks
					Delta^			Severe disease	100 (44.3-100)		
					Gamma specifically^			Documented infection	81.3 (-298-97.9)		
344	Chemaitelly et al (November 1, 2022)	Qatar	Retrospective cohort	56,802 matched pairs of individuals with prior breakthrough Omicron infection (all ages)	**Omicron^**	Previously infected only	BNT162b2 or mRNA-1273	Documented reinfection	57 (52-62)	91+ (≥ 90 days post primary Omicron infection)	~85 weeks
343	Grewal et al* (March 7, 2023) *[Published version of Nov 1, 2022 preprint]*	Canada	Test-negative case control	6,279 adults aged 50-59	**Omicron BA.1/BA.2 specifically^**	Included	BNT162b2 or mRNA-1273	Severe disease	83 (76-88)	240-299	~74 weeks
				3,882 adults aged 60-69					83 (74-89)	≥300	
				2,427 adults aged 70-79					79 (71-86)	≥300	
				2,632 adults aged 80+					80 (72-86)	≥300	
				6,279 adults aged 50-59					72 (62-79)	≥300	
									87 (43-97)	240-299	~86 weeks
									56 (30-72)	≥300	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				3,882 adults aged 60-69	Omicron BA.4/BA.5 specifically^				43 (16-61)	≥300	
				2,427 adults aged 70-79					48 (25-64)	≥300	
				2,632 adults aged 80+					40 (18-56)	≥300	
342	Moghnieh et al* (September 22,2022)	Lebanon	Retrospective case control	4,507 employees in the National Airlines company aged 18+	Delta specifically^	Included	Sputnik V	Documented infection	52.3(-27.4-78.7)	3-5 months	~30 weeks
						Excluded			23.7 (-84.7-62.8)	7-9 months	
						Included	BNT162b2		20.1 (-94.7-61.6)	7-9 months	
						Excluded			95.1 (78.4-99.3)	< 3 months	
					Omicron specifically^	Included	Sputnik V		67.5 (12.8-87.2)	< 7 months	
						Excluded			71.8 (22.3-89.1)	< 7 months	
						Included	Sputnik V		-54.1 (-151-0.84)	> 6 months	~43 weeks
						Excluded			-46 (-149.7-10.1)		
						Included	BNT162b2		23.1 (-28.7-52.1)	3-5 months	
						Excluded			21.9 (-38.9-54.1)		
341	Tartof et al* (October 25,2022)	USA	Test-negative case control	3,416 encounters in adults≥ 18	Omicron BA.4/BA.5 specifically^	Included	BNT162b2	Emergency department visit for ARI	30 (-86-74)	<6 months	~84 weeks
									44 (20-61)	≥6 months	
				11,376 encounters in adults ≥18				Urgent care visit for ARI	50 (10-72)	<6 months	
									7 (-11-22)	≥6 months	
				21,385 encounters in adults ≥18				Outpatient care visit for ARI	30 (4-49)	<6 months	
									19 (9-29)	≥6 months	
				1386 encounters in adults aged ≥18				Hospitalization for ARI	-4 (-118-50)	≥6 months	
340	Nordstrom et al* (February 21, 2023) *[Published version of October 24,2022 preprint]*	Sweden	Case control	659,924 adolescents	Omicron BA.1, BA.2^	Excluded	BNT162b2 or mRNA-1273	Documented infection (vaccinated on or after January 1, 2022)	51 (48-55)	7+	~6 weeks
								Documented infection (vaccinated on or after September 1, 2021)	12 (10-13)	7+	~24 weeks
								Hospitalization with COVID-19 as main diagnosis (vaccinated on or after November 15, 2021)	87 (66-95)	7+	~27 weeks
								Hospitalization with COVID-19 as main diagnosis (vaccinated	69 (29-87)	48+	~45 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								before November 15, 2021)			
339	Collie et al* (October 24, 2022)	South Africa	Test-negative case control	53,771 HCW aged 18+ with low physical activity	Beta and Delta††	Included	Ad26.COV2.S	Documented infection	48.0 (9.7-70.1)	14-20	~34 weeks
									39.8 (34.0-45.1)	28+	
								Hospitalization	60 (39-73.8)	28+	
				62,721 HCW aged 18+ with moderate physical activity				Documented infection	39.0 (-4.9-64.5)	14-20	
									36.3 (31.3-41.0)	28+	
								Hospitalization	72.1 (55.2-82.6)	28+	
				79,952 HCW aged 18+ with high physical activity				Documented infection	51.0 (16.8-71.1)	14-20	
									41.2 (37.5-44.7)	28+	
								Hospitalization	85.8 (74.1-92.2)	28+	
338	Surie et al* (October 21, 2022)	USA	Test-negative case control	4,730 hospitalizations in adults aged ≥18	**Omicron BA.1/BA.2^**	Included	BNT162b2 or mRNA-1273	Hospitalization with COVID-like illness	63 (46–75)	14-150	~74 weeks
									34 (20–46)	150+	
					Omicron BA.4/BA.5^				83 (35–96)	14-150	~82 weeks
									37 (12–55)	150+	
337	Britton et al* (October 21, 2022)	USA	Test-negative case control	34,220 hospitalizations in adults aged ≥18	**Omicron BA.1^**	Included	BNT162b2 or mRNA-1273	Hospitalization with COVID-like illness (immunocompromised)	40 (34–46)	14+	~56 weeks
					Omicron BA.2/ BA.2.12.1^				7 (–16–25)		~69 weeks
					Omicron BA.4/BA.5^				38 (23–50)		~77 weeks
					Omicron BA.2/ BA.2.12.1/ BA.4/BA.5^				22 (10–33)		~77 weeks
336	Embi et al* (May 22, 2023) *[published version of October 21, 2022, preprint]*	USA	Test-negative case control	200,071 ED/UC events in immuno-competent adults aged ≥18	Delta^	Included	mRNA-1273	Emergency department and urgent care visit for COVID-like illness (immunocompetent)	90 (89-91)	14-149	~46 weeks
									84 (83-85)	>150	
							BNT162b2		85 (84-86)	14-149	
									73 (72-74)	>150	
				70,882 hospitalization in immuno-competent adults aged ≥18 years			mRNA-1273	Hospitalization with COVID-like illness (immunocompetent)	95 (92-95)	14-149	
									89 (88-90)	>150	
							BNT162b2		90 (88-91)	14-149	
									80 (79-82)	>150	
				8,848 ED/UC events in immuno-			mRNA-1273	Emergency department and urgent care visit for COVID-like illness (immunocompromised)	79 (64-88)	14-149	
									64 (54-72)	>150	
							BNT162b2		62 (45-73)	14-149	
									56 (46-64)	>150	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				compromised adults aged ≥18							
				18,843 hospitalization in immuno-compromised adults aged ≥18			mRNA-1273	Hospitalization with COVID-like illness (immunocompromised)	81 (69-88)	14-149	
									73 (68-77)	>150	
							BNT162b2		68 (58-75)	14-149	
									64 (58-69)	>150	
				3,234 immuno-competent adults aged ≥18			Ad26.COV2.S	Emergency department and urgent care visit for COVID-like illness (immunocompetent)	67 (63-71)	14-149	
									62 (58-65)	>150	
								Hospitalization with COVID-like illness (immunocompetent)	77 (71-82)	14-149	
									69 (65-73)	>150	
				968 immuno-compromised adults aged ≥18				Emergency department and urgent care visit for COVID-like illness (immunocompromised)	9 (-66-50)	14-149	
									-6 (-49-25)	>150	
								Hospitalization with COVID-like illness (immunocompromised)	35 (-3-60)	14-149	
									43 (23-58)	>150	
335	Zerbo et al* (February 28,2023) *[Published version of October 18, 2022 preprint]*	USA	Cohort study	30,288 infants born to mothers 16-50 years of age who were members of Kaiser Permanente Northern California	Omicron^	Excluded	BNT162b2 or mRNA-1273 in 1st trimester	Documented infection in the first 2 months of life	26 (-22-56)	7+	~11 months
								Documented infection in the first 4 months of life	23 (-6-44)		~13 months
								Documented infection in the first 6 months of life	19 (-3-37)		~15 months
							BNT162b2 or mRNA-1273 in 2nd trimester	Documented infection in the first 2 months of life	37 (-21-67)		~8 months
								Documented infection in the first 4 months of life	5 (-28-29)		~10 months
								Documented infection in the first 6 months of life	3 (-19-21)		~12 months
							BNT162b2 or mRNA-1273 in 3rd trimester	Documented infection in the first 2 months of life	-4 (-84-41)		~5 months
								Documented infection in the first 4 months of life	12 (-23-37)		~7 months
								Documented infection in the first 6 months of life	18 (-4-36)		~9 months
					Delta^	Excluded		Documented infection in the first 2 months of life	61 (-31-89)	7+	~11 months

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
							BNT162b2 or mRNA-1273 in 1st trimester	Documented infection in the first 4 months of life	48 (-54-82)		~13 months
								Documented infection in the first 6 months of life	49 (-46-82)		~15 months
							BNT162b2 or mRNA-1273 in 2nd trimester	Documented infection in the first 2 months of life	91 (63-98)		~8 months
								Documented infection in the first 4 months of life	60 (23-79)		~10 months
								Documented infection in the first 6 months of life	65 (33-81)		~12 months
							BNT162b2 or mRNA-1273 in 3rd trimester	Documented infection in the first 2 months of life	87 (55-96)		~5 months
								Documented infection in the first 4 months of life	70 (43-84)		~7 months
								Documented infection in the first 6 months of life	54 (27-71)		~9 months
334	Consonni et al* (October 19, 2022)	Italy	Retrospective cohort	5,596 HCWs	**Omicron^** *(Note: 88.3% of cases were during the Omicron period; 8.2% and 3.5% of cases were during Alpha, and Delta periods, respectively)*	Excluded	BNT162b2	Documented infection	70 (54-80)	7-119	~67 weeks
						Previously infected only			16 (0-43)	120+	
									25 (0-69)	7-119	
									88 (66-96)	120+	
333	Chambers et al* (October 19,2022)	Canada	Test-negative case control	801 cases and 8,879 controls with HIV aged 19+	Delta and Alpha^	Excluded	BNT162b2 or mRNA-1273	Documented infection	82 (74-88)	7+	~44 weeks
								Symptomatic disease	93 (79-98)		
								Severe disease	97 (80-99)		
							AZD1222	Documented infection	77 (34-92)		
							AZD1222 + any mRNA		80 (49-92)		
332	Wan et al* (October 17, 2022)	Hong Kong SAR	Case control	204,901 cases and 819,315 controls among adults aged 60+ y	**Omicron BA.2^**	Excluded	BNT162b2	Documented infection: 60-79 y	17.3 (15.2-19.3)	14-180	~24 weeks
								Hospitalization: 60-79 y	74.6 (72.1-76.8)		
								Severe disease: 60-79 y	77.5 (65.7-85.2)		
								Death: 60-79 y	92.1 (88.7-94.5)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								Documented infection: 80+ y	54.2 (51.4-56.9)		
								Hospitalization: 80+ y	81 (78.2-83.5)		
								Severe disease: 80+ y	82.7 (62.7-92)		
								Death: 80+ y	92.5 (89.3-94.8)		
							CoronaVac	Documented infection: 60-79 y	-23.1 (-25.8 to -20.5)		
								Hospitalization: 60-79 y	59.4 (56.6-62)		
								Severe disease: 60-79 y	57.7 (43.8-68.2)		
								Death: 60-79 y	79.6 (75-83.3)		
								Documented infection: 80+ y	31.2 (28.7-33.6)		
								Hospitalization: 80+ y	58.4 (55.8-60.9)		
								Severe disease: 80+ y	55 (38.6-67)		
								Death: 80+ y	69.4 (65.6-72.8)		
331	Mimura et al* (October 8, 2022)	Japan	Retrospective cohort	105,267 individuals aged 16-64 years	**Omicron specifically^**	Excluded	BNT162b2 or mRNA-1273	Documented infection	15.8 (7.9-23.1)	14+ (Includes up to 13 days post booster dose)	~43 weeks
								Symptomatic disease	21.2 (11-30.3)		
				105,618 individuals aged 16-64 years	Delta specifically^			Documented infection	82.9 (69.4-90.4)		~31 weeks
								Symptomatic disease	95.7 (82.5-98.9)		
330	Risk et al* (October 8, 2022) *Note: this study does not adjust for calendar time*	USA	Test-negative case control	4,332 adolescents aged 12-17 years	**Omicron specifically^**	Included	BNT162b2	Documented infection	54.5 (17.8-76.9)	0-3 months	~58 weeks
									4.2 (-20.2-23.6)	≥6 months	
					Delta specifically^				81.9 (67.9-90.8)	0-3 months	~44 weeks
									65.3 (34.6-83.8)	≥6 months	
329	Buchan et al* (September 22, 2022)	Canada	Test-negative case control	134,435 adults in Ontario (18+ y)	**Omicron specifically^**	Included	BNT162b2 or mRNA-1273 *Note: ~7.1% of participants received one dose of AZD1222 as part of their primary series*	Symptomatic disease	36 (24-45)	7-59	~49 weeks
									2 (-17-17)	240+	
								Severe disease	75 (51-87)	120-179	
									82 (62-91)	180-239	
					Delta specifically^			Symptomatic disease	89 (86-92)	7-59	
									80 (74-84)	240+	
								Severe disease	94 (84-98)	7-59	
									95 (85-99)	240+	
328	Lewis et al* (September 28,2022)	USA	Outbreak investigation	57 LTCF residents aged 60+ years	Gamma specifically^	Unknown	BNT162b2 or mRNA-1273	Documented infection	80 (46.4-92.6)	14+	~14 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
327	Rudan et al* (September 28, 2022)	Scotland	Test-negative case control	148,055 children aged 12-15 years	Omicron specifically^	Included	BNT162b2	Symptomatic disease	81.2 (77.7-84.2)	14-35	~21 weeks
									48.7 (22-66.3)	98+	
					Delta specifically^				100 (-Inf -100)	14-35	~10 weeks
									92.9 (42.5-99.1)	42-63	
				37,628 adolescents aged 16-17 years	Omicron specifically ^				65.5 (56-73)	14-35	~27 weeks
									1.2 (-49.3-34.6)	98+	
					Delta specifically^				95.6 (77-99.1)	14-35	~17 weeks
									96.7 (51.3-99.8)	42-63	
326	Lin et al* (September 26, 2022) *Note: this study includes additional VE estimates for individuals vaccinated during different time periods.*	USA	Retrospective cohort	10,600,823 residents of North Carolina, 5+ years	Omicron^	Included	BNT162b2	Documented infection	37.5 (36.0-39.0)	~47 weeks	~60 weeks
									0.8 (-1.5-3)	~60 weeks	
								Hospitalization	58.8 (49.3-66.5)	~47 weeks	
									29.4 (10.3-44.4)	~60 weeks	
								Death	75.2 (67.7-81.0)	~47 weeks	
									59.1 (27.2-77)	~60 weeks	
							mRNA-1273	Documented infection	47.2 (45.8-48.5)	~46 weeks	~60 weeks
									30.3 (28.9-32.9)	~59 weeks	
								Hospitalization	64.7 (57.2-70.9)	~46 weeks	
									61.5 (49.6-70.6)	~59 weeks	
								Death	69.6 (62.3-75.5)	~46 weeks	
									48.3 (22.6-65.4)	~59 weeks	
							Ad26.COV2.S	Documented infection	48.8 (47.2-50.4)	~41 weeks	~54 weeks
									49 (46.4-51.4)	~54 weeks	
								Hospitalization	65.3 (58.3-71.1)	~41 weeks	
									53.3 (26.7-70.2)	~54 weeks	
								Death	76.1 (69.2-81.4)	~41 weeks	
									77.5 (19.6-93.7)	~54 weeks	
					Delta^		BNT162b2	Documented infection	54.3 (53.6-55)	~25 weeks	~38 weeks
									47.4 (46.6-48.2)	~38 weeks	
								Hospitalization	85.8 (83.4 -87.8)	~25 weeks	
									70.9 (65.3-75.6)	~38 weeks	
								Death	89.6 (87-91.6)	~25 weeks	
									77.4 (70.6-82.6)	~38 weeks	
							mRNA-1273	Documented infection	69.2 (68.5-69.9)	~24 weeks	~37 weeks
									48.4 (47.5-49.3)	~37 weeks	
								Hospitalization	89.8 (88.1-91.3)	~24 weeks	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
									72.7 (67.8-77)	~37 weeks	
								Death	93 (91.1-94.5)	~24 weeks	
									85.1 (80.1-88.8)	~37 weeks	
							Ad26.COV2.S	Documented infection	59.2 (57.7-60.7)	~20 weeks	~33 weeks
									60.5 (58.9-62.1)	~33 weeks	
								Hospitalization	77.9 (72.2-82.4)	~20 weeks	
									70.0 (64.8-74.5)	~33 weeks	
								Death	83.8 (76.1-89.0)	~20 weeks	
									79.2 (73.1-84.0)	~33 weeks	
					Alpha^		BNT162b2	Documented infection	67.6 (66.9-68.3)	~3 weeks	~21 weeks
									58.6 (58-59.2)	~21 weeks	
								Hospitalization	94.1 (92.2-95.5)	~3 weeks	
									87.1 (85-88.9)	~21 weeks	
								Death	97.1 (94.7-98.4)	~3 weeks	
									91.9 (89.4-93.8)	~21 weeks	
							mRNA-1273	Documented infection	90.1 (89.6-90.7)	~2 weeks	~20 weeks
									71.9 (71.3-72.6)	~20 weeks	
								Hospitalization	96.5 (95.1-97.6)	~2 weeks	
									90.4 (88.6-91.9)	~20 weeks	
								Death	97.2 (95.1-98.4)	~2 weeks	
									92.8 (90.3-94.6)	~20 weeks	
							Ad26.COV2.S	Documented infection	70.6 (68.8-72.3)	~2 weeks	~10 weeks
									63.0 (60.8-65.0)	~10 weeks	
								Hospitalization	67.9 (56.5-76.3)	~2 weeks	
									79.3 (71.7-84.8)	~10 weeks	
								Death	62.3 (38.2-77)	~2 weeks	
									85.7 (74.6- 91.9)	~10 weeks	
325	Grewal et al* (December 3,2022) *[Published version of September 30, 2022 preprint]*	Canada	Test-negative case control	21,275 cases and 273,466 controls amongst LTCF residents aged 60+ in Ontario	**Omicron BA.1, BA.2, BA.4,BA.5^**	Excluded	BNT162b2 or mRNA-1273	Documented infection	3 (-7-12)	0+	~80 weeks
								Symptomatic disease	21 (1-38)		
								Severe disease	43 (24-58)		
324	Link-Gelles et al* (March 15,2023)	USA	Test-negative case control	103,236 ED/UC encounters and	**Omicron BA.4/BA.5^**	Included	BNT162b2	ED/UC encounter for COVID-like illness	45 (27-59)	14-149	~82 weeks
									24 (19-27)	150+	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	[Published version of October 5, 2022, preprint]			hospitalizations in adults aged 18+				Hospitalization for COVID-like illness	17 (7-27)	150+	
							mRNA-1273	ED/UC encounter for COVID-like illness	51 (30-66)	14-149	
									30 (25-34)	150+	
								Hospitalization for COVID-like illness	28 (17-38)	150+	
							Heterologous mRNA vaccines	ED/UC encounter for COVID-like illness	70 (52-81)	14-149	
									38 (29-46)	150+	
323	Ferdinands et al * (October 3, 2022)	USA	Test-negative case control	893,461 adults (18+) admitted to a hospital or ED/UC center across 10 states	Omicron^	Excluded	BNT162b2, mRNA-1273	ED/UC encounter: All	63 (57-68)	<2 mos	~67 weeks
									22 (5-36	16-<18 mos	
								Hospitalization: All	73 (63-80)	<2 mos	
									19 (6-30)	14+ mos	
								Hospitalization: Immunocompromised	34 (13-51)	<4 mos	
									20 (1-36)	6+ mos	
					Delta^			ED/UC encounter	93 (92-94)	<2 mos	~47 weeks
									66 (60-72)	10-<12 mos	
								Hospitalization	96 (95-97)	<2 mos	
									68 (59-75)	10-<12 mos	
					Alpha††			ED/UC encounter	95 (94-96)	<2 mos	~19 weeks
									86 (78-91)	4-<6 mos	
								Hospitalization	94 (93-95)	<2 mos	
									87 (77-93)	4-<6 mos	
322	Schrag et al* (September 26, 2022)	USA	Test-negative case control	4517 ED/UC encounters and 975 hospitalizations among pregnant persons (aged 18-45) across 10 states	Omicron^	Included	BNT162b2 or mRNA-1273	Emergency Dept/Urgent Care encounter	16 (-22-42)	14+	~55 weeks
									3 (-49-37)	14-149	
									42 (-16-72)	150+	
								Hospitalization	77 (28-93)	14+	
									86 (41-97)	14-149	
									64 (-102-93)	150+	
					Delta^			Emergency Dept/Urgent Care encounter	83 (68-91)	14+	~45 weeks
									84 (69-92)	14-149	
									75 (5-93)	150+	
								Hospitalization	98 (96-99)	14+	
									99 (96-100)	14-149	
									96 (86-99)	150+	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
321	Copur et al* (September 28, 2022)	Turkey	Retrospective cohort	1,911 healthcare workers	Alpha^	Excluded	CoronaVac	Documented infection	65 (50-75)	14+	~15 weeks
320	Más-Bermejo et al* (September 23, 2022)	Cuba	Retrospective cohort	53,638 individuals aged ≥19 years	Delta^	Excluded	Abdala	Severe disease	98.2 (97.9-98.5)	14+	~20 weeks
								Death	98.7 (98.3-99)		
319	Xu et al* (December 5,2022) *[Published version of September 20, 2022 preprint]*	Sweden	Retrospective cohort	2,291,504 adults aged 65+	Non-VOC, Alpha, Delta, Omicron^	Included	BNT162b2	Documented infection	85.8 (83.8-88.2)	28+	~51 weeks
									18.2 (2.2-31.6)	350-371	
								Hospitalization	87.2 (83.6-90.0)	28+	
									68.5 (45.5-81.8)	350-371	
							mRNA-1273	Documented infection	94.6 (89.6-97.2)	28+	
									11.8 (-55.5-50.0)	350-371	
								Hospitalization	96.0 (89.5-98.5)	28+	
									21.5 (-89.2-67.4)	350-371	
							AZD1222	Documented infection	43.6 (1.9-67.6)	28+	~39 weeks
									-2.3 (-627.9-85.6)	266-287	
								Hospitalization	74.6 (-5.0-93.9)	28+	
									28.7 (-37.6-63.0)	238-259	
318	Chung et al* (September 7,2022)	Canada	Test-negative case control	1,387,462 individuals aged 16+	Non-VOC, Alpha^	Excluded	BNT162b2 or mRNA-1273	Documented infection	89 (88-90)	7-59	~15 weeks
									80 (75-85)	60-119	
								Symptomatic disease	94 (91-96)	7-59	
									93 (79-98)	60-119	
								Severe disease	95 (90-97)	7-59	
				881,270 individuals aged 16+	Alpha^			Documented infection	92 (91-93)	7-59	~24 weeks
									82 (79-85)	120-179	
								Symptomatic disease	92 (91-94)	7-59	
									86 (78-91)	120-179	
								Severe disease	94 (92-95)	7-59	
									97 (95-98)	60-119	
				1,426,940 individuals aged 16+	Delta^			Documented infection	90 (90-90)	7-59	~42 weeks
									78 (76-80)	≥240	
								Symptomatic disease	94 (94-95)	7-59	
									88 (86-90)	≥240	
								Severe disease	98 (98-99)	7-59	
									98 (95-99)	≥240	
317	Martin et al* (September 10, 2022)	UK	Prospective cohort	1105 patients with end-stage kidney disease undergoing hemodialysis in London	Non-VOC, Alpha, Delta††	Included	BNT162b2	Documented infection	62 (18-82)	14+	~46 weeks
							AZD1222		42 (-22-70)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
316	Collie et al* (September 14, 2022)	South Africa	Test-negative case control	32,883 hospitalized adults (18+)	Omicron BA.1 or BA.2^	Included	BNT162b2	Hospitalization	80.3 (62.8-89.5)	14-27	~36 weeks
									38.4 (16.9-54.4)	7-8 mos	
					Omicron BA.4 or BA.5^				47.4 (19.9-65.5)	3-4 mos	~53 weeks
									19.3 (6.3-30.5)	9+ mos	
315	Chatzilena et al* (December 7,2022) *[Published version of September 12, 2022 preprint]*	UK	Test-negative case control	8543 hospitalized adults (18+) in Bristol	Delta^	Excluded	BNT162b2	Hospitalization	82.5 (76.2-87.2)	7+	~56 weeks
									91.5 (83.1-96.2)	≤3 months	
									79.5 (71.5-85.3)	>3 months	
314	Mallah et al* (September 10, 2022)	Spain	Test-negative case control	909,636 persons aged 11+ y In Galicia	Alpha, Delta††	Excluded	BNT162b2 or mRNA-1273	Documented infection	72 (71-73)	7+	~42 weeks
								Hospitalization *Note: Includes some booster recipients*	74 (70-77)		
313	Chico-Sanchez et al* (August 31, 2022)	Spain	Test-negative case control	6364 HCW in the Valencian Autonomous Community	Non-VOC, Alpha^	Included	BNT162b2	Documented infection	91.6 (89.6-93.2)	12-120	~22 weeks
									71.5 (67-75.5)	>120	
							mRNA-1273	Documented infection	95.2 (88.3-98.1)	12-120	
									88.3 (75.7-94.4)	>120	
							BNT162b2 or mRNA-1273	Hospitalization	96.8 (76.1-99.6)	12+	
312	Huang et al* (October 20, 2022) *[Update to September 9, 2022 preprint]*	China	Matched case control	612,597 cases aged ≥3 years	Omicron^	Excluded	Ad5-nCoV	Documented infection	13.2 (10.9-15.5)	14+	~62 weeks
								Severe/critical illness	77.9 (15.6-94.2)		
311	Monge et al* (September 2 ,2022)	Spain	Case cohort	14,777 adults aged 50-59 years	Delta^	Included	BNT162b2	Documented infection	77 (76-77)	14+	~21 weeks
								Symptomatic infection	77 (76-78)		
								Hospitalization	97 (97-98)		
								Death	97 (93-99)		
							mRNA-1273	Documented infection	87 (86-87)		
								Symptomatic infection	89 (88-90)		
								Hospitalization	98 (97-99)		
								Death	94 (75-99)		
							AZD1222	Documented infection	59 (56-61)		
								Symptomatic infection	59 (55-62)		
								Hospitalization	96 (93-98)		
							Ad26.COV2.S	Documented infection	64 (62-66)		
								Symptomatic infection	56 (53-59)		
								Hospitalization	86 (83-89)		
								Death	89 (64-97)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
							AZD1222 + any mRNA	Documented infection	88 (85-91)		
								Symptomatic infection	82 (75-87)		
								Hospitalization	98 (84-100)		
310	Penayo et al* (June 2022)	Paraguay	Test-negative case control	2,458 cases and 2,054 controls 18+ years with severe acute respiratory illness (SARI)	Delta^	Included	BNT162b2	Hospitalization with severe acute respiratory infection (SARI)	91.9 (72.2-97.6)	14+	~37 weeks
							mRNA-1273		76.1 (-127.4-97.5)		
							AZD1222		83.0 (66.3-91.5)		
							Sputnik V		83.2 (48.9-94.5)		
							Hayat vax		31.8 (-41.2-67.1)		
							Covaxin		25.8 (-37.1-59.9)		
					Omicron^		BNT162b2		49.5 (9.9-71.7)	14+	~52 weeks
									78.0 (-97.0-97.5)	14-89	
							mRNA-1273		42.1 (-105.4-83.7)	14+	
							AZD1222		10.1 (-31.0-38.3)	14+	
							Sputnik V		25.7 (-29.9-57.5)	14+	
									64.4 (-44.6-92.2)	14-89	
							Hayat vax		40.4 (-5.1-66.2)	14+	
							Covaxin		13.0 (-45.8-48.0)	14+	
309	Barraza et al* (August 5, 2022)	Chile	Retrospective cohort	3282 cases and 3199 controls	Gamma, Delta and Omicron^	Included	BNT162b2	Hospitalization with severe acute respiratory infection (SARI)	80.3 (68.9-87.5)	14+	~77 weeks
							AZD1222		72.4 (32.8-88.6)		~71 weeks
							CoronaVac		54.5 (45.2 – 62.3)		~72 weeks
308	Suphanchaimat et al* (July 5,2022)	Thailand	Test-negative case control	558,865 cases and 1,139,723 controls aged 18+	Delta^	Included	BNT162b2	Documented infection	74.2 (71.8-76.3)	15-29	~2 weeks
									57 (43.6-57.2)	90+	~15 weeks
							AZD1222		61.4 (59.6-63.2)	15-29	~2 weeks
									25.8 (19.1- 31.9)	90+	~31 weeks
							CoronaVac		27.9 (0.3-47.9)	15-29	~2 weeks
									49.8 (47.8-51.6)	90+	~40 weeks
							AZD1222 + BNT162b2		79.9 (74-84.5)	15-29	~2 weeks
									77.4 (68.2-84)	90+	~19 weeks
							CoronaVac + AZD1222		57.8 (56.3-59.2)	15-29	~2 weeks
									36.6 (33.6-39.4)	90+	~39 weeks
							CoronaVac + BNT162b2		74.7 (62.8-82.8)	15-29	~2 weeks
									84.6 (64.9-89.3)	90+	~19 weeks
307	Lind et al* (November 21, 2022) [Update to August 26, 2022 preprint]	USA	Test-negative case control	241,654 individuals aged ≥16 years	Alpha^	Excluded	BNT162b2 or mRNA-1273	Documented infection	84.4 (75.5-90.0)	14-89	~29 weeks
									96.5 (75.1-99.5)	90-149	
								Symptomatic disease	86.6 (75.5-92.7)	14-89	
									93.8 (55.0-99.1)	90-149	
								Hospitalization	85.5 (65.5-93.9)	14-89	
									82.2 (-34.5-97.7)	90-149	
					Delta^			Documented infection	68.9 (58.0-77.1)	14-89	
									37.1 (24.0-48.1)	150+	
								Symptomatic disease	74.8 (62.9-82.9)	14-89	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
									48.4 (32.8-60.4)	150+	
								Hospitalization	85.4 (60.2-94.6)	14-89	
									66.2 (42.5-80.1)	150+	
306	Lim et al* (August 24,2022)	Malaysia	Test-negative case control	14,199 individuals aged ≥18 years	Alpha, Delta^	Excluded	BNT162b2	Documented infection	58.9 (40.7-71.9)	14-27	~28 weeks
									31.3 (10.8-47.2)	98-111	
								ICU admission	92.5 (72.3-98.8)	14+	
								Death	96.5 (82.3-99.8)		
			Retrospective cohort					Documented infection	87.9 (86.3-89.4)		
								ICU admission	97.5 (81.2-99.6)		
								Death	99.3 (96.3-100)		
305	Cocchio et al* (August 20, 2022)	Italy	Retrospective cohort	122,213 children aged 5-11 years	Omicron^	Excluded	BNT162b2	Documented infection	53 (51-55)	14-34	~16 weeks
									23 (20-26)	70+	
				96,072 adolescents aged 12-17 years					59 (55-62)	14-34	~53 weeks
									8 (5-11)	70+	
							mRNA-1273		55 (49-61)	14-34	~33 weeks
									20 (15-24)	70+	
				141,003 adolescents aged 12-17 years	Delta^		BNT162b2		88 (85-91)	14-34	~28 weeks
									82 (74-88)	70+	
							mRNA-1273		90 (68-97)	14-34	~7 weeks
									96 (86-99)	35-69	
304	Tsang et al* (December 12, 2022) *[Update to August 25, 2022 preprint]*	Hong Kong SAR	Prospective cohort	8636 individuals aged 5+ y	Omicron BA.2^	Excluded	BNT162b2	Documented infection	27.6 (-6.3-50.7)	14-89	~55 weeks
									1.1 (-22.4-20.1)	90+	
								Symptomatic disease	31.6 (-9.3-57.2)	14-89	
									4.7 (-23.5-26.6)	90+	
							CoronaVac	Documented infection	22.7 (-15.2-48.2)	14-89	
									5.4 (-25.6-28.8)	90+	
								Symptomatic disease	12.2 (-40-44.9)	14-89	
									6.4 (-32.1-33.7)	90+	
303	Wan et al* (August 17, 2022)	Hong Kong SAR	Case-Control	82,587 cases of COVID-19 infection, 10,241 cases of COVID-19 related hospital admission, 539 cases of ICU admission in patients with Diabetes	Omicron BA.2^	Excluded	BNT162b2	Documented infection	22.1 (20-24.2)	14+	~53 weeks
								Hospitalization	74.2 (71.7-76.4)		
								ICU admission	82.3 (72.1-88.8)		
							CoronaVac	Documented infection	-0.3 (-2.7 -2.1)		
								Hospitalization	64.2 (61.8-66.4)		
								ICU admission	58.1 (45-68.1)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				Mellitus (DM) aged ≥12 y							
302	Powell et al* (November 24,2022) *[Published version of August 22, 2022 preprint]*	UK	Test-negative case control	1,161,704 tests among adolescents (aged 11-17 y) in England	Omicron^	Excluded	BNT162b2	Symptomatic disease	64.5 (63.6-65.4)	14-104	~38 weeks
									25.7 (-4.2-47.0)	280-286	
					Delta^	Excluded	BNT162b2	Symptomatic disease	91.8 (91.2-92.3)	14-104	~37 weeks
									71.9 (67.9-75.4)	175-279	
301	Yan et al* (August 18, 2022)	Hong Kong, SAR	Case control	9021 cases and 89,440 controls among adults aged 18+ y	Omicron BA.2^	Excluded	BNT162b2	Severe disease (18-50 y)	73.7 (54.2-84.9)	14+	~52 weeks
								Severe disease (51-64 y)	84.5 (72.2-91.4)		
								Severe disease (65+ y)	81.9 (74.4-87.2)		
								Death (18-50 y)	84.2 (67.3-92.4)		
								Death (51-64 y)	86.9 (80.3-91.3)		
								Death (65+ y)	90.6 (88.5-92.4)		
							CoronaVac	Severe disease (18-50 y)	72.6 (40.1-87.5)		
								Severe disease (51-64 y)	67.8 (48.7-79.7)		
								Severe disease (65+ y)	56.7 (47.4-64.4)		
								Death (18-50 y)	83.7 (57.9-93.7)		
								Death (51-64 y)	78.1 (69.4-84.3)		
								Death (65+ y)	72.5 (69.9-74.9)		
300	Kim et al* (Augut 17, 2022)	South Korea	Retrospective cohort	3,203,985 adolescents aged 12-18	Delta, Omicron††	Excluded	BNT162b2	Documented infection (12-15 y)	76.6 (74.3-78.6)	14-29	~6 weeks
									49.6 (45.9-53.2)	30-59	
								Documented infection (16-17 y)	83.5 (81.3-85.4)	14-29	~11 weeks
									41.8 (35.3-47.6)	60-89	
								Documented infection (18 y)	82.8 75.1-88.1)	14-29	~22 weeks
									28.9 (20.6-36.4)	90+	
299	Risk et al* (August 16,2022)	USA	Retrospective cohort	162,805 immunocompetent and 5,609 immunosuppressed individuals aged ≥18 years	Omciron^	Included	BNT162b2	Documented infection (immunosuppressed)	13 (-23-39)	14+	~56 weeks
								Documented infection (immunocompetent)	-6 (-16-4)		
								Hospitalization (all)	67 (51-78)		
							mRNA-1273	Documented infection (immunosuppressed)	57 (29-74)		
								Documented infection (immunocompetent)	16 (5-26)		
								Hospitalization (all)	79 (63-88)		
							BNT162b2 or mRNA-1273	Hospitalization (immunosuppressed)	85 (62-94)		
								Hospitalization (immunocompetent)	68 (53-78)		
								ICU admission	92 (66-98)		
298	Cheng et al*					Excluded	BNT162b2	Documented infection	38 (34-41)	14+	~51 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	(August 11,2022)	Hong Kong, SAR	Retrospective cohort	103,143 patients with chronic kidney disease (CKD) in Hong Kong	Omicron††		*Note: Includes some 3-dose recipients*	Hospitalization	64 (57-69)		
								Death	86 (80-90)		
							CoronaVac *Note: Includes some 3-dose recipients*	Documented infection	4 (0-8)		
								Hospitalization	44 (37-91)		
								Death	70 (64-75)		
297	Lewis et al* (July 27, 2022)	USA	Retrospective cohort	94,516 individuals (aged 12+) with prior SARS-CoV-2 infection in Rhode Island	Non-VOC, Alpha, Delta^	Previously infected persons only	BNT162b2 or mRNA-1273	Documented infection	64 (58-69)	14+	~46 weeks
							Ad26.COV2.S		48 (26-63)		
				3124 LTCF residents (12+) with prior SARS-CoV-2 infection in Rhode Island			BNT162b2 or mRNA-1273		49 (26-65)		
							Ad26.COV2.S		57 (-211-94)		
				2877 LCTF employess (12+) with prior SARS-CoV-2 infection in Rhode Island			BNT162b2 or mRNA-1273		52 (26-68)		
							Ad26.COV2.S		-68 (-415-45)		
296	El Adam et al* (April 15, 2022)	Canada	Test-negative case control	8722 HCWs (aged 18+) in British Columbia	Alpha, Gamma, Delta^	Excluded	BNT162b2	Documented infection	89 (87-91)	14+	~34 weeks
							mRNA-1273		93 (90-95)		
							Heterologous mRNA		92 (86-95)		
							Any mRNA		90 (88-92)	14+	
									99 (90-100)	14-20	
									82 (75-87)	196+	
295	Zambrano et al* (August 4,2022)	USA	Test-negative case control	160 cases and 272 controls aged 12-18 years	Omicron^	Included	BNT162b2	Hospitalization with MIS-C	92 (71-98)	28+	~40 weeks
					Delta^				94 (83-98)		
					Delta and Omicron^				90 (75-96)	28-120	
									92 (78-97)	≥120	
				144 cases and 230 controls aged 5-11 years					78 (48-90)	28+	~16 weeks
294	Pinto-Álvarez* (October 13, 2022)	Colombia	Nested cohort	6963 solid organ transplant	Mu, Delta and Omicron^	Excluded	BNT162b2	Documented infection	73.4 (68.6-77.5)	15+	~56 weeks
								Hospitalization	85.4 (80.1-89.3)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	[Update to August 6,2022 preprint]			recipients aged ≥16 years				Death	93.4 (89.8-95.7)		
							mRNA-1273	Documented infection	28.1 (0-48.9)		
								Hospitalization	85.2 (64.6-93.8)		
								Death	96.9 (76.5-99.6)		
							AZD1222	Documented infection	67.9 (57.9-75.5)		
								Hospitalization	82.5 (70.9-89.5)		
								Death	93.8 (86.4-97.1)		
							CoronaVac	Documented infection	74.2 (68.3-79.1)		
								Hospitalization	83.3 (75.3-88.7)		
								Death	92.6 (87.5-95.6)		
							Ad26.COV2.S	Documented infection	73.7 (65.2-80.1)		
								Hospitalization	88.4 (77.4-94.0)		
								Death	97.1 (87.9-99.3)		
293	Tartof et al* (August 3, 2022)	USA	Test-negative case control	3168 adolescents aged 12 to 17 years	**Omicron specifically^**	Included	BNT162b2	ED or UC encounters	73 (54-84)	<60	~44 weeks
						Excluded			16 (-7-34)	≥180	
					Delta	Included			72 (52-84)	<60	
						Excluded			18 (-6-36)	≥180	
									89 (69-96)	<60	
									49 (27-65)	≥180	
									88 (68-96)	<60	
									47 (23-63)	≥180	
292	Arashiro et al* (August 3, 2022)	Japan	Case control	5975 individuals aged 20+	**Omicron^**	Included	BNT162b2 or mRNA-1273	Symptomatic disease	55 (34-69)	14-89	~54 weeks
					Delta				52 (37-63)	180+	
									88 (80-92)	14-89	
									86 (35-97)	90-180	
291	Piche-Renaud et al* (March 3, 2023) *[Update to August 1,2022 preprint]*	Canada	Test-negative case control	14,673 children aged 5-11 years	**Omicron BA.1/2, BA.4/5^**	Included	BNT162b2	Symptomatic disease	49 (43-54)	7+	~29 weeks
									66 (60-71)	7-29	
									-4 (-30-46)	120+	
								Hospitalization or death	79 (63-88)	7+	
									94 (57-99)	7-29	
									57 (-20-85)	120+	
290	Mayr et al* (June 22, 2022)	USA	Test-negative case control	4.8 million veterans	Non-VOC, Alpha, Delta††	Excluded	BNT162b2	Symptomatic disease (all ages)	76.1 (71.1-80.2)	14 d-1 mo	2 weeks
									0.1 (-10.9-10.1)	7 mos	~26 weeks
								Symptomatic disease (<65 y)	81.6 (75.9-85.9)	14 d-1 mo	2 weeks
									22.5 (7.2-35.2)	7 mos	~26 weeks
								Symptomatic disease (65+ y)	66.3 (55.7-74.4)	14 d-1 mo	2 weeks
									-23.3 (-40.5 to -8.2)	7 mos	~26 weeks
								Hospitalization (all ages)	72.9 (61.7-80.7)	14 d-1 mo	2 weeks
									19.8 (2.5-34.1)	7 mos	~26 weeks
								Hospitalization (<65 y)	85.6 (72.6-92.4)	14 d-1 mo	2 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
									57 (31.2-73.2)	7 mos	~26 weeks
								Hospitalization (65+ y)	61 (41.3-74.2)	14 d-1 mo	2 weeks
									1.7 (-22-20.8)	7 mos	~26 weeks
								ICU admission or death (all ages)	74.7 (54.2-86)	14 d-1 mo	2 weeks
									39.5 (17.6-55.6)	7 mos	~26 weeks
								ICU admission or death (<65 y)	87.6 (61-96.1)	14 d-1 mo	2 weeks
									66.4 (7.7-87.8)	7 mos	~26 weeks
								ICU admission or death (65+ y)	67.4 (32.6-84.3)	14 d-1 mo	2 weeks
									29.3 (2.3-48.9)	7 mos	~26 weeks
							mRNA-1273	Symptomatic disease (all ages)	84.6 (80.5-87.8)	14 d-1 mo	2 weeks
									46.6 (40.8-51.9)	7 mos	~26 weeks
								Symptomatic disease (<65 y)	89.7 (84.8-93)	14 d-1 mo	2 weeks
									57.3 (48.4-64.7)	7 mos	~26 weeks
								Symptomatic disease (65+ y)	78.4 (71.1-83.9)	14 d-1 mo	2 weeks
									36.2 (27.7-43.6)	7 mos	~26 weeks
								Hospitalization (all ages)	76.6 (63.9-84.8)	14 d-1 mo	2 weeks
									71.3 (64-77.1)	7 mos	~26 weeks
								Hospitalization (<65 y)	92 (76.1-97.3)	14 d-1 mo	2 weeks
									83.1 (66.8-91.4)	7 mos	~26 weeks
								Hospitalization (65+ y)	66.1 (45.3-79)	14 d-1 mo	2 weeks
									64.7 (55.2-72.3)	7 mos	~26 weeks
								ICU admission or death (all ages)	80.5 (64.1-89.4)	14 d-1 mo	2 weeks
									77.2 (68.4-83.5)	7 mos	~26 weeks
								ICU admission or death (<65 y)	89.2 (49.5-97.7)	14 d-1 mo	2 weeks
									84.4 (59-94.1)	7 mos	~26 weeks
								ICU admission or death (65+ y)	75.4 (51.7-87.5)	14 d-1 mo	2 weeks
									73.8 (62.9-81.5)	7 mos	~26 weeks
							Ad26.COV2.S	Symptomatic disease (all ages)	25.4 (2.9-42.6)	14 d-1 mo	2 weeks
									25.5 (-2.2-45.6)	7 mos	~26 weeks
								Hospitalization (all ages)	55.8 (20.6-75.4)	14 d-1 mo	2 weeks
									16.9 (-90.9-63.8)	7 mos	~26 weeks
								ICU admission or death (all ages)	61.1 (11.9-82.8)	14 d-1 mo	2 weeks
									63.3 (-15.5-88.3)	7 mos	~26 weeks
289	Chemaitelly et al* (November 2, 2022) *Published version of July 26, 2022 preprint*	Qatar	Retrospective cohort	35,806 children aged 12-17 years	Omicron^	Excluded	BNT162b2	Documented infection	51.3 (34.9-63.6)	14+	~25 weeks
									-1.7 (-20- 10)	172+	~73 weeks
				37,456 children aged 5-11 years			BNT162b2		49.6 (28.5-64.5)	14-43	~4 weeks
									-9.5 (-30- 35)	104+	~17 weeks
							BNT162b2		95.3 (92-97.2)	14-30	~4 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				46,634 children aged 12-17 years	Alpha and Delta^				70.6 (18-92)	134+	~41 weeks
288	Mazagatos et al* (July 26,2022)	Spain	Test-negative case control	1772 SARI patients aged 20 and older	Alpha and Delta^	Included	BNT162b2 or mRNA-1273	Hospitalization in 20-59 year olds	92 (78-97)	14+	~19 weeks
									95 (82-98)	<90	
									91 (50-98)	>152	
								Hospitalization in 60-69 year olds	97 (86-99)	14+	
									97 (87-99)	<90	
									96 (47-100)	>152	
								Hospitalization in 70-79 year olds	98 (90-100)	<90	~23 weeks
									91 (24-99)	>152	
								Hospitalization in 80+ year olds	86 (70-94)	<90	~33 weeks
									48 (-51-82)	>152	
							Ad26.COV2.S	Hospitalization in 20-59 year olds	71 (-3 – 92)	14+	~19 weeks
								Hospitalization in 60-69 year olds	82 (-78-98)		
							AZD1222	Hospitalization in 60-69 year olds	89 (25-98)		
287	Tan et al* (July 20,2022)	Singapore	Retrospective cohort	225,280 children aged 5-11 years	Omicron^	Excluded	BNT162b2	All confirmed infections (PCR or antigen)	48.8 (46.9-50.8)	7-14	~9 weeks
									25.6 (19.3-31.5)	>60	
								PCR-confirmed infection	70.6 (65.9-74.7)	7-14	
									42.7 (12-62.7)	>60	
								Hospitalization	87.8 (72.2-94.7)	7-14	
									80.4 (67-88.4)	30-59	
286	Hatfield et al* (July 20,2022)	USA	Retrospective cohort	4,315 nursing home residents	Non-VOC, Alpha^	Excluded	BNT162b2	Documented infection	67 (40-82)	7-157	~44 weeks
							mRNA-1273		75 (32-91)		
					Delta^		BNT162b2		33 (-2-56)	>157	
							mRNA-1273		77 (48-91)		
285	Cerqueira-Silva et al* (July 18,2022)	Brazil	Test-negative case control	2,471,576 individuals aged 18+	Omicron^	Included	CoronaVac	Symptomatic infection	-0.7 (-1.6-0.2)	14-180	~59 weeks
									3.2 (2.1-4.2)	>180	
								Hospitalization or death	64.5 (62.6-66.3)	14-180	
									61.8 (60.3-63.2)	>180	
								Death	67.8 (64-71.3)	14-180	
									63.1 (60.9-65.1)	>180	
284	Link-Gelles et al (July 15,2022)	USA	Test-negative case control	159,432 ED/UC encounters and hospitalizations in adults aged 18+	Omicron BA.1^	Excluded	BNT162b2 or mRNA-1273	ED/UC encounter for COVID-like illness	47 (44-50)	14-149	~44 weeks
									39 (37-41)	≥150	
								Hospitalization for COVID-like illness	68 (63-73)	14-149	
									61 (58-63)	≥150	
									51 (38-60)	14-149	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				113,837 ED/UC encounters and hospitalizations in adults aged 18+	**Omicron BA.2^**			ED/UC encounter for COVID-like illness	12 (7-17)	≥150	
								Hospitalization for COVID-like illness	57 (19-77)	14-149	
									24 (12-35)	≥150	
283	Guedalia et al* (November 15, 2022) *[Published version of July 11, 2022 prperint]*	Israel	Retrospective cohort	82,803 pregnant women aged 16+	**Omicron BA.1^**	Excluded	BNT162b2	Hospitalization	-12 (-36-8)	0+	~60 weeks
								Hospitalization with moderate disease	51 (-47-84)		
								Severe disease	83 (-47-98)		
					Delta^			Hospitalization	61 (51-69)		~44 weeks
								Hospitalization with moderate disease	97 (92-99)		
								Severe disease	96 (86-99)		
282	Stephenson et al* (July 11, 2022)	USA	Retrospective cohort	2315 hospitalized individuals aged 18+	Non-VOC, Alpha††	Included	BNT162b2 or mRNA-1273	Hospitalization	85 (81-89)	14+	~18 weeks
281	Kerr et al* (July 9,2022)	Scotland	Test-negative case control	269,712 individuals aged 18+	Delta and Delta plus (AY.4.2)^	Unknown	BNT162b2	Symptomatic infection	78.7 (69.9-85)	14+	~38 weeks
							mRNA-1273		93.7 (86.4-97.1)		
							AZD1222		54.5 (35.7-67.8)		
280	Tonnara et al* (July 4, 2022)	Republic of San Marino	Retrospective cohort	18,109 individuals aged ≥18 years	Alpha and Delta^	Excluded	Sputnik V	Documented infections	91.8 (86.3-95.1)	7-59	~27 weeks
									57.8 (42.2-69.2)	120+	
								Hospitalization	95.2 (79.1-98.9)	7-59	
									89.7 (52.7-97.7)	120+	
					Alpha^			Documented infections	97.3 (94.2-98.7)	7+	~15 weeks
								Hospitalization	96.9 (86.5-99.3)	7+	
279	Paternina-Caicedo et al* (July 1, 2022)	Colombia	Retrospective cohort	7,19,735 adults aged ≥40 years	Mu^	Excluded	BNT162b2	Symptomatic disease	13 (5.3-20)	14+	~25 weeks
								Hospitalization	45.5 (29.4-58)		
								Critical care admission	82.2 (60.1-92.1)		
								Death	94.1 (76.4-98.5)		
							CoronaVac	Symptomatic disease	-45.1 (-53.6- -37.1)		
								Hospitalization	-3 (-18-10.2)		
								Critical care admission	13.6 (-13.2-34)		
								Death	20.6 (-0.5-37.3)		
278	Tartof et al* (October 7, 2022) *Published version of June 30, 2022 preprint*	USA	Test-negative case control	29,507 hospital admissions and 36,306 ED admissions in individuals aged ≥18 years	**Omicron BA.1 specifically^**	Included	BNT162b2	Hospitalization	54 (38-65)	<6 months	~70 weeks
									32 (16-45)	≥6 months	
								ED admissions	42 (31-52)	<6 months	
									19 (6-31)	≥6 months	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
					Omicron BA.2 specifically^			Hospitalization	56 (-2-81)	<6 months	
									56 (28-73)	≥6 months	
								ED admissions	27 (-11-52)	<6 months	
									12 (-10-31)	≥6 months	
277	Ionescu et al* (January 16, 2023) *[Published version of June 28, 2022 preprint]*	Canada	Test-negative case control	193,899 tests among adolescents aged 12-17 in Quebec	**Omicron^**	Excluded	BNT162b2	Documented infection	41.9 (37.7-45.8)	14+	~26 weeks
									75.6 (65.8-82.6)	14-27	2 weeks
									33.9 (27.4-39.9)	168-195	~26 weeks
								Symptomatic disease	55.2 (49.5-60.3)	14+	
					Delta, **Omicron^**			Documented infection	82.8 (81-84.4)	14+	~22 weeks
									83.1 (68.9-90.8)	14-27	2 weeks
									75.4 (72.1-78.4)	140-167	~22 weeks
								Symptomatic disease	87.9 (86.1-89.5)	14+	
					Delta^			Documented infection	95.5 (95-96)	14+	~18 weeks
									97.7 (96.2-98.6)	14-27	2 weeks
									92.4 (90.4-94)	112-139	~18 weeks
								Symptomatic disease	97.3 (96.8-97.7)	14+	
				60,903 tests among adolescents aged 12-17 in British Columbia	**Omicron^**			Documented infection	33.9 (25.7-41.1)	14+	~26 weeks
									63.4 (21.4-83)	14-27	2 weeks
									22.2 (8.4-33.9)	168-195	~26 weeks
					Delta, **Omicron^**				88 (85.1-90.3)	14+	~22 weeks
									94.8 (83.7-98.4)	28-55	~6 weeks
									84.2 (77.8-88.8)	140-167	~22 weeks
					Delta^				95.7 (95.1-96.2)	14+	~18 weeks
									96.8 (94.4-98.2)	14-27	2 weeks
									90.9 (87.7-93.2)	112-139	~18 weeks
276	Cohen-Stavi et al* (June 29, 2022)	Israel	Retrospective cohort/ Target trial emulation	94,728 matched pairs of children aged 5-11 years	**Omicron^**	Excluded	BNT162b2	Documented infection	51 (39-61)	7-21	1 week
								Symptomatic disease	48 (29-63)		
275	Carazo et al* (September 21, 2022) *[Published version of June 27 preprint]*	Canada	Test-negative case control	37,732 cases and 73,507 controls amongst HCWs in Quebec aged 18-59 years	**Omicron BA.2 specifically^**	Excluded	BNT162b2 or mRNA-1273	Documented infection	35 (27-42)	14+	~70 weeks
								Symptomatic disease	61 (52-69)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
274	Moline et al* (June 27,2022)	USA	Outbreak investigation	91 residents of skilled nursing facility aged 50+	Beta^	Excluded	BNT162b2 or mRNA-1273	Documented infection	65 (25-84)	14+	~12 weeks
273	Magro et al (June 22, 2022)	USA	Matched case control	4,238 skilled nursing facility healthcare personel aged 18-54 in California	Non-VOC, Alpha††	Included	BNT162b2 or mRNA-1273	Documented infection	71.7 (55.9-81.8)	14+	~10 weeks
						Excluded			72.7 (54.3-83.7)		
272	Adams et al * (October 11,2022) *Published, updated analysis of June 14, 2022 preprint*	USA	Prospective test-negative case control	4,760 hospitalised patients aged ≥18 years	**Omicron BA.1, BA.2 and BA.5 specifically^**	Included	BNT162b2	Hospitalization	36 (21-48)	14+	~72 weeks
							mRNA-1273		41 (25-54)		
							Ad26.COV2.S		32 (1-54)		
271	Gray et al * (June 9,2022) *[Published version of December 29,2021 preprint; see reference #17 in Table 2]*	South Africa	Test-negative case control	93,854 HCWs	**Omicron^**	Excluded	BNT162b2	Hospitalization	88 (62-96)	14-27	~30 weeks
									67 (63-71)	148-207	
								ICU admission	69 (56-79)	14-27	
									71 (65-76)	148-207	
270	Al Kaabi et al* (June 9, 2022)	UAE	Retrospective cohort	1,153,515 vaccinated individuals matched with 1,153,515 unvaccinated individuals (18+ years)	Non-VOC^	Excluded	BBIBP-CorV	Hospitalization	97.3 (95.7-98.3)	14+	~39 weeks
								Critical care admission	98.8 (95.3-99.7)		
								Death	100 (100-100)		
					Alpha^			Hospitalization	73.3 (70.6-75.7)		
								Critical care admission	79.1 (73.1-83.7)		
								Death	81.9 (66.9-90.1)		
					Delta^			Hospitalization	34.6 (14.2-50.2)		
								Critical care admission	49.6 (0-76.4)		
								Death	62.5 (31.4-79.5)		
269	European Centre for Disease Prevention and Control (March 14, 2022)	11 EU countries	Test-negative case control	4,828 hospitalized adults aged 30+	Non-VOC, Alpha†† (pre-Delta^)	Included	BNT162b2	Hospitalization	94 (88-97)	14+	~45 weeks
					Delta^		BNT162b2		82 (76-87)		
							AZD1222		79 (69-86)		
268	European Centre for Disease Prevention and Control	10 EU countries	Test-negative case control	1456 hospitalized adults aged 65+	Non-VOC, Alpha†† (pre-Delta^)	Included	BNT162b2	Hospitalization	91 (80-96)	14+	~22 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	(October 8, 2021)										
267	Lewis et al* (June 8, 2022)	USA	Test-negative case control	6208 adults (18+ years) hospitalized in 21 facilities across the US	Alpha, Delta^	Included	Ad26.COV2.S	Hospitalization: All	70 (63-75)	14+	~39.5 weeks
									73 (60-82)	14-90	
									70 (54-81)	>180	
								Hospitalization: Immunocompromised	55 (31-72)	14+	
					Alpha^			Hospitalization: All	68 (43-83)		
					Delta^				72 (64-78)		
266	Lin et al* (June 8, 2022)	USA	RCT crossover	14,164 placebo and 14,287 vaccinated participants 18+ years	Original & Alpha††	Excluded	mRNA-1273	Symptomatic disease	92.6 (80.5-97.2)	12 days	~0 weeks
									89.6 (41.7-98.2)	172 days	~22.5 weeks
265	Richterman et al* (June 6, 2022)	USA	Test-negative case control	14,520 tests among healthcare workers	Omicron^	Excluded	BNT162b2	Symptomatic disease	41 (-17-87)	14+	~63 weeks
							mRNA-1273		5 (-69-47)		
					Delta^		BNT162b2		75 (52-87)		
							mRNA-1273		73 (56-84)		
264	Spicer et al* (May 26, 2022)	USA	Test-negative case control	89,736 adolescents (aged 12-17 y) in Kentucky	Delta^	Excluded	BNT162b2 or mRNA-1273	Documented infection	81 (79.7-82.3)	14+	~36.5 weeks
						Previously infected only			78.3 (66.7-86.5)		
263	Grewal et al* (July 6, 2022) *[Update to June 1, 2022 preprint]*	Canada	Test-negative case control	13,654 cases and 205,862 controls amongst LTCF residents aged 60+ in Ontario	Omicron specifically^	Included	BNT162b2 or mRNA-1273	Documented infection	6 (-5-15)	0+	~66 weeks
								Symptomatic disease	23 (1-40)		
								Hospitalization or death	52 (33-65)		
262	Carlsen et al* (June 1, 2022)	Norway	Retrospective cohort study	21, 643 newborns	Omicron^	Excluded	BNT162b2 or mRNA-1273 *(~4% of mothers received AZD1222 as first dose)*	Documented infection during an infant's first 4 months of life (born to unvaccinated mothers and mothers vaccinated in 2nd or 3rd trimester)	30 (17-41)	14+	~45 weeks
					Delta^			Documented infection during an infant's first 4 months of life (born to unvaccinated mothers	71 (56-81)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								and mothers vaccinated in 2nd or 3rd trimester)			
261	Chin et al * (October 26, 2022) *[Previous preprint version Chin et al (May 27,2022)]*	USA	Retrospective cohort	59,794 residents and 16,752 staff aged 18+	Omicron and Delta^	Excluded	BNT612b2 or mRNA-1273	Documented infection (Residents)	18.6 (7.7-28.1)	14+	~ 65 weeks
								Documented infection (Staff)	40.1 (34-45.6)		
						Included before July 01/2021		Documented infection (Residents)	51.2 (41.5-59.2)		
								Documented infection (Staff)	55.8 (49.6-61.2)		
						Included since July 01/2021		Documented infection (Residents)	68.7 (38.5-84.1)		
								Documented infection (Staff)	83.2 (77.7-87.4)		
			Retrospective test-negative case control	15,783 resident and 8,539 staff cases, matched with 180,169 resident and 90,409 staff controls aged 18+		Excluded		Documented infection	14.9 (12.3-19.7)		
						Included before July 01/2021			47.8 (46.6-52.8)		
						Included since July 01/2021			73.1 (69.8-80.1)		
260	Amir et al* (September 9, 2022) *[Update to May 25, 2022 preprint]*	Israel	Retrospective cohort	691,921 children 5-10 years	Omicron^	Excluded	BNT162b2	Documented infection	58.3 (54.6-61.5)	14-35	~2 weeks
259	Tsundue et al* (May 24, 2022)	India	Prospective cohort	1114 residents of congregate living facilities in Dharamshala (all ages)	Delta^	Included	Covishield	Documented infection	98 (85-99.8)	14+	13 weeks
								Shortness of breath/ use of supplemental oxygen, hospitalisation, or death	99 (90-99.8)		
258	Paranthaman et al* (May 20, 2022)	UK	Retrospective cohort	197,885 LTCF residents aged 65+ in England	Alpha, Delta^	Excluded	BNT162b2	Documented infection	62 (46-73)	7-34	~3 weeks
									47 (32-58)	147+	~37 weeks
								Death	86 (67-94)	7-34	~3 weeks
									69 (51-80)	147+	~37 weeks
							AZD1222	Documented infection	61 (40-74)	7-34	~3 weeks
									29 (10-43)	147+	~24.5 weeks
								Death	83 (58-94)	7-34	~3 weeks
									56 (33-70)	147+	~24.5 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
						Previously infected persons only	BNT162b2	Documented infection	79 (15-95)	7-34	~3 weeks
									80 (43-93)	147+	~37 weeks
							AZD1222	Documented infection	37 (-50-73)	7-34	~3 weeks
									65 (14-86)	147+	~24.5 weeks
257	Fano et al* (May 18,2022)	Italy	Retrospective cohort	946,156 individuals aged 12+	Alpha, Delta^	Excluded	BNT612b2 or mRNA-1273	Documented infection	70.9 (69.3-72.4)	40-44	~48 weeks
									22.7 (18.5-26.8)	200+	
							AZD1222		76.3 (71.9- 80)	40-44	
									3.8 (0.0-9.2)	125+	
							Ad26.COV2.S		39.4 (28.3-48.8)	40-44	
									2.5 (0.0-9.1)	150+	
							AZD1222+ BNT612b2 or mRNA-1273		81.6 (75.3-86.3)	40-44	
									3.1 (0.0-12.0)	125+	
256	Tenforde et al* (May 17, 2022)	USA	Case-control	10,078 adults (aged 18+) hospitalized at 21 hospitals across 18 states	Alpha, Delta††	Included	BNT162b2	Hospitalization (Overall)	88 (86-90)	14-179	~23.5 weeks
									79 (74-83)	180+	~47 weeks
							mRNA-1273		93 (91-94)	14-179	~23.5 weeks
									87 (83-90)	180+	~47 weeks
							BNT612b2 or mRNA-1273	Hospitalization: Immunocompetent persons	90 (88-91)	14-179	~23.5 weeks
									82 (79-85)	180+	~47 weeks
								Hospitalization: Immunocompromised persons	63 (55-69)	14+	~47 weeks
									65 (57-72)	14-179	~23.5 weeks
									53 (38-65)	180+	~47 weeks
					Delta^			Hospitalization (Overall)	90 (88-91)	14-179	~23.5 weeks
									83 (80-86)	180+	~47 weeks
255	Lan et al* (May 12, 2022)	USA	Retrospective cohort	4615 HCW in Massachusetts	Non-VOC, Alpha, Delta††	Excluded	BNT162b2 or mRNA-1273 *Note: A small proportion (~2.5%) received Ad26.COV2.S*	Documented infection	82.3 (75.1-87.4)	14+	~36 weeks
					Delta^				76.5 (40.9-90.6)		
254	Braeye et al* (May 11, 2022)	Belgium	Retrospective cohort	139,140 contacts of 123,409 index cases among women aged 45-64	Alpha^	Excluded	BNT162b2	Documented infection	72 (70-74)	7-57	~28.5 weeks
							mRNA-1273		82 (79-84)	14-64	
							Ad26.COV2.S		38 (34-44)	21-71	
							AZD1222		56 (51-59)	14-64	
					Delta^		BNT162b2		64 (63-66)	7-57	
									44 (43-44)	157-207	
							mRNA-1273		75 (71-77)	14-64	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
									56 (55-58)	164-214	
							Ad26.COV2.S		33 (28-38)	21-71	
									22 (19-25)	171-221	
							AZD1222		49 (45-52)	14-64	
									35 (33-37)	164-214	
						Previously infected persons only	BNT162b2	Documented infection	87 (84-88)	7-57	
									82 (81-83)	157-207	
							mRNA-1273		87 (83-92)	14-64	
									85 (80-89)	164-214	
							Ad26.COV2.S		88 (85-91)	21-71	
									87 (84-89)	171-221	
							AZD1222		88 (84-94)	14-64	
									83 (81-85)	164-214	
253	Martellucci et al* (April 22, 2022)	Italy	Retrospective cohort	1,279,694 residents of the Abruzzo region (all ages)	Alpha, Delta, Omicron††	Excluded	BNT162b2	Documented infection	24 (23-25)	14+	~53 weeks
								Hospitalization	86 (84-88)		
								Death	92 (90-94)		
							mRNA-1273	Documented infection	32 (31-34)		
								Hospitalization	90 (86-93)		
								Death	96 (92-98)		
							AZD1222	Documented infection	4 (1-6)		
								Hospitalization	93 (92-95)		
								Death	98 (96-99)		
							Ad26.COV2.S	Documented infection	12 (7-17)		
								Hospitalization	87 (73-94)		
252	Zahradka et al* (May 3, 2022)	Czech Republic	Retrospective cohort	2101 kidney transplant recipients	Alpha^	Excluded	BNT162b2 or mRNA-1273	Documented infection	45.6 (12.4 -67.6)	14+	~12.5 weeks
251	Simwanza et al* (September 12, 2022) *[Update to June 8, 2022 preprint]*	Zambia	Case-control	180 cases and 202 controls in a correctional facility 18+ y	Omicron^	Included	Ad26.COV2.S	Documented infection	63.6 (33.6-80.5)	14+	~13 weeks
								Symptomatic disease	73 (41.6-87.7)		
							AZD1222	Documented infection	89.4 (59.5-97.8)		
								Symptomatic disease	85.1 (19.5-98)		
250	Rennert et al* (January 10,2023) *[Published version of May 7, 2022 preprint]*	USA	Propensity matched case control	1,944 students aged 18-64	Omicron^	Included	BNT162b2	Documented infection	2.1 (-21.2-21)	14+	~23 weeks
				658 employees aged 18-65			mRNA-1273		17.3 (-10.8-38.3)		
							BNT162b2		30.1 (-24.5-60.8)		
							mRNA-1273		14.4 (-64.2-55.4)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
249	Ma et al* (May 3, 2022)	China	Retrospective cohort/Outbreak investigation	1058 close contacts 18+ years	Delta^	Included	BBIBP-CorV	Symptomatic disease	75.5 (63-93.6)	14+	~8 weeks
								Pneumonia	56.5 (-95.9-90.4)		
							CoronaVac	Symptomatic disease	73 (22.3-96)		
								Pneumonia	84.6 (18.8-97.1)		
							Ad5-nCoV	Symptomatic disease	61.5 (9.5-83.6)		
								Pneumonia	67.9 (1.7-89.9)		
								Severe disease	100 (CI omitted)		
248	Carazo et al* (October 14, 2022) *[Update from May 3, 2022 preprint]*	Canada	Test-negative case control	224,007 cases and 472,432 controls among individuals (12+ y) in Quebec	Omicron^	Excluded	BNT162b2 or mRNA-1273	Documented infection	42 (41-44)	7+	~51 weeks
								Hospitalization	76 (74-78)		
						Previously infected only		Documented infection	23.2 (21.2-27.4)		
								Hospitalization	68.4 (63.6-73.5)		
247	Kirsebom et al* (December 12, 2022) *[Update to May 1, 2022 preprint]*	UK	Test-negative case control	759,450 adults aged 40-64 y	Omicron specifically^	Included	AZD1222	Symptomatic disease	8.0 (6.0-9.9)	175+	~44.5 weeks
				166,720 adults aged 65+ y				Symptomatic disease	19.5 (11.7-26.6		
								Hospitalization	61 (49.8-69.7)		
					Delta specifically^			Hospitalization	73.4 (70.4-76.2)		
246	Florentino et al* (August 13, 2022) *[Update to April 29, 2022 preprint]*	Brazil	Test-negative case control	89,595 cases and 108,363 controls aged 6-11 years	Omicron^	Included	CoronaVac	Symptomatic disease	39.8 (33.7-45.4)	14+	~12 weeks
								Hospitalization	59.2 (11.3-84.5)		
244	Sharma et al* (April 27,2022)	USA	Matched case control	221,267 veterans	Omicron^	Excluded	BNT162b2	Documented infection	25.3 (21.8-28.7)	14+	~42 weeks
								Hospitalization	52.9 (47.8-57.6)		
								Death	50.7 (37.9-61.6)		
							mRNA-1273	Documented infection	39.5 (35.8-43)		
								Hospitalization	66.7 (61.4-71.6)		
								Death	65.6 (52.8-76.3)		
243	Castillo et al* (April 21, 2022)	France	Test-negative case control	761,744 cases 18+ years	Omicron specifically^	Included	BNT162b2 or mRNA-1273 *Note: A small proportion (~3%) received two doses of AZD1222*	Symptomatic infection	43 (41-45)	0-30	~48 weeks
									11 (10-13)	>180	
								Hospitalization	59 (49-70)	0-30	
									56 (51-62)	>180	
								ICU admission	70 (40-97)	0-30	
									72 (63-81)	>180	
								Death	60 (24-92)	0-30	
									54 (41-69)	>180	
				166,009 cases	Delta specifically^			Symptomatic infection	78 (77-80)	0-30	
									63 (62-64)	>180	
								Hospitalization	91 (87-95)	0-30	
									90 (89-91)	>180	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								ICU admission	93 (86-99)	0-30	
									95 (93-97)	>180	
								Death	90 (79-100)	0-30	
									87 (83-91)	>180	
242	Eick-Cost et al* (April 20, 2022)	USA	Case control	441,379 US military personnel	Pre-Delta^ (Non-VOC, Alpha††)	Excluded	BNT162b2	Documented infection	87.6 (86.2-88.9)	14+	~19 weeks
								Asymptomatic infection	80.3 (76.5-83.5)		
								Symptomatic infection	89.9 (88.4-91.2)		
								Hospitalization	88.0 (75.4-94.1)		
							mRNA-1273	Documented infection	93.5 (91.9-94.7)		
								Asymptomatic infection	94.7 (91.9-96.6)		
								Symptomatic infection	93.1 (91.2-94.6)		
								Hospitalization	89.6 (57.5-97.4)		
							Ad26.COV2.S	Documented infection	81.8 (74.2-87.1)		
								Asymptomatic infection	81.4 (62.6-90.8)		
								Symptomatic infection	82.4 (73.9-88.2)		
					Delta^		BNT162b2	Documented infection	69.3 (68.2-70.3)	14+	~35 weeks
								Asymptomatic infection	66.0 (64.0-67.8)		
								Symptomatic infection	71.0 (69.7-72.1)		
								Hospitalization	88.4 (82.1-92.5)		
							mRNA-1273	Documented infection	79.4 (78.3-80.4)		
								Asymptomatic infection	77.0 (75.1-78.8)		
								Symptomatic infection	80.6 (79.4-81.8)		
								Hospitalization	88.1 (75.7-94.2)		
							Ad26.COV2.S	Documented infection	38.3 (34.5-41.9)		
								Asymptomatic infection	19.6 (12.2-26.4)		
								Symptomatic infection	48.9 (45-52.7)		
								Hospitalization	57.7 (2.6-81.6)		
241	Gonzalez et al* (July 16, 2022) *[Published version of April 19 preprint]*	Argentina	Retrospective cohort	1,536,435 children aged 3-17 years in Buenos Aires Province	Delta, **Omicron^**	Included	BNT162b2 or mRNA-1273 (ages 12-17)	Hospitalization	81 (59.9-90.1)	14+	~17 weeks
							BBIBP-CorV (ages 3-11)		83.4 (70.9-90.2)		~9 weeks
					Omicron^		BNT162b2 or mRNA-1273 (ages 12-17)		78.2 (42-90.3)		~25 weeks
							BBIBP-CorV (ages 3-11)		58.6 (4.1-79.7)		16 weeks
240	Cerqueira-Silva et al* (January 11, 2023)	Brazil	Test-negative case control	5,281,586 adults (aged 18+)	**Omicron^**	Included	BNT162b2	Symptomatic disease	49.2 (48.5-49.9)	14-59	~7 weeks
									9.6 (8.1-11)	150+	~33 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	[Update to April 14, 2022 preprint]							Severe disease	82.9 (80.6-85)	14-59	~7 weeks
									82.6 (80.7-84.3)	150+	~33 weeks
							AZD1222	Symptomatic disease	26.7 (25.2-28.2)	14-59	~7 weeks
									0.9 (0-1.9)	150+	~36 weeks
								Severe disease	77.1 (72.9-80.6)	14-59	~7 weeks
									67.8 (66.7-69)	150+	~36 weeks
		Scotland		555,825 adults (aged 18+)			BNT162b2	Symptomatic disease	57.7 (54.5-60.6)	14-59	~7 weeks
									17.8 (15.1-20.5)	150+	~38.5 weeks
								Severe disease	90.4 (30.4-98.7)	14-59	~7 weeks
									72.9 (57.9-82.5)	150+	~38.5 weeks
							AZD1222	Symptomatic infection	40.7 (26.6-52.1)	14-59	~7 weeks
									9.6 (6.3-12.9)	150+	~35.5 weeks
								Severe disease	78.8 (31.8-93.4)	60-149	~19 weeks
									52.8 (33.3-66.7)	150+	~35.5 weeks
239	Widdifield et al* (April 14, 2022)	Canada	Test-negative case control	36,145 individuals with rheumatoid arthritis	Alpha, Delta^	Included	BNT162b2	Documented infection	82 (78-85)	7+	~44 weeks
							mRNA-1273		86 (80-90)		
							BNT162b2 or mRNA-1273	Documented infection	83 (80-86)		
								Severe outcomes	92 (88-95)		
				7863 individuals with ankylosing spondylitis			BNT162b2	Documented infection	88 (82-93)		
							mRNA-1273		93 (83-97)		
							BNT162b2 or mRNA-1273	Documented infection	89 (83-93)		
								Severe outcomes	97 (83-99)		
				47,199 individuals with psoriasis			BNT162b2	Documented infection	82 (79-85)		
							mRNA-1273		87 (82-91)		
							BNT162b2 or mRNA-1273	Documented infection	84 (81-86)		
								Severe outcomes	92 (86-95)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				31,311 individuals with inflammatory bowel disease			BNT162b2	Documented infection	82 (79-85)		
							mRNA-1273		87 (82-91)		
							BNT162b2 or mRNA-1273	Documented infection	79 (74-82)		
								Severe outcomes	94 (88-97)		
238	Sanchez Ruiz et al* (April 2022)	France	Retrospective cohort	72 LTCF residents in southern France	Delta specifically^	Excluded	BNT162b2	Documented infection	11.2 (0-61.1)	14+	
								Symptomatic disease	88.4 (59.9-96.7)		
								Severe disease	93.5 (67.2-98.7)		
237	Lind et al* (December 1,2022) *[Update to April 25, 2022 preprint]*	USA	Test-negative case control	11,307 cases and 130,041 controls aged ≥5 years	Omicron BA.1 specifically^	Excluded	BNT162b2 or mRNA-1273	Documented infection	27.1 (18.7-34.6)	14-149	~67 weeks
						Included			13.6 (8.7-18.2)	≥150	
			1:1 Matched case control			Excluded			41 (14.1-59.4)	14-149	
						Included			32.1 (16.6-44.7)	≥150	
									30.7 (20.6-39.6)	14-140	
									20 (14-25.6)	≥150	
									14.3 (-43.1-48.7)	14-140	
									18.8 (-9- 39.5)	≥150	
236	Gram et al* (September 1,2022) *[Published verson of April 20, 2022 preprint]*	Denmark	Retrospective cohort	4,056,935 individuals aged 12-59 years	Omicron^	Excluded	BNT162b2 or mRNA-1273	Documented infection	40 (38.6-41.3)	14-30	~56 weeks
									12.6 (12-13.3)	>120	
								Hospitalization	96.2 (72.9-99.5)	14-30	
									77.6 (72.6-81.6)	>120	
					Delta^			Documented infection	92.2 (91.8-92.6)	14-30	
									64.8 (64-65.8)	>120	
								Hospitalization	99.5 (98.4-99.8)	14-30	
									93.5 (91.6-95)	>120	
				1,688,168 adults aged ≥60 years	Omicron^			Documented infection	39.9 (26.3-50.9)	14-30	
									4.4 (-0.1-8.7)	>120	
					Delta^			Documented infection	82.3 (75.5-87.2)	14-30	
									50 (46.7-53)	>120	
								Hospitalization	97.5 (94.8-98.8)	31-60	
									87.5 (85.6-89.2)	>120	
					Alpha^			Documented infection	90.7 (88.2-92.7)	14-30	
									73.2 (57.1-83.3)	>120	
								Hospitalization	98.1 (94.7-99.3)	14-30	
									96.5 (73.4-99.5)	>120	
235	Vokó et al* (July 22,2022)	Hungary	Retrospective cohort	*6,193,552 individuals aged 18-64 years*	Delta^	Included	BNT162b2	Documented infection	70.3 (69.2-71.3)	14-120	~47 weeks
									0.6 (-2.3-3.4)	>240	
								Hospitalization	82.6 (80.1-84.7)	14-120	
									69.6 (64.9-73.6)	>240	
								Death	87.4 (81.5-91.5)	14-120	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	[Published version of April 18, 2022 preprint]			*Note: VE for persons aged 65-100 years are also aavailable from publication; estimates are relatively similar across age groups.*					73.6 (61.1-82.1)	>240	
							mRNA-1273	Documented infection	76.9 (73.3-80.0)	14-120	
									22.6 (6.1-36.2)	>240	
								Hospitalization	84.9 (75.4-90.8)	14-120	
									42.5 (-4.0, 68.2)	>240	
								Death	77.7 (30.7-92.8)	14-120	
									100 (CI omitted)	>240	
							AZD1222	Documented infection	39.2(36.4-41.9)	14-120	
									-14 (-20.5- -7.9)	>240	
								Hospitalization	76.2 (70.6-80.7)	14-120	
									48.8 (38.2-57.6)	>240	
								Death	90.1 (73.5-96.3)	14-120	
									57.1 (35.2-71.6)	>240	
							Sputnik V	Documented infection	38.3 (31.8-44.3)	14-120	
									-4.6 (-12.5-2.9)	>240	
								Hospitalization	90.4 (78.5-95.7)	14-120	
									78.7 (69.1-85.4)	>240	
								Death	89.3 (79.9-94.3)	121-180	
									79.1 (59.8-89.2)	>240	
							Ad26.COV2.S	Documented infection	39.3 (36.1-42.4)	14-120	
									35.9 (32.5-39.2)	181-240	
								Hospitalization	43.2 (32.9-52)	14-120	
									59.4 (50.1-67.0)	181-240	
								Death	59.8 (35.2-75.1)	14-120	
									76.1 (56.7-86.8)	181-240	
							BBIBP-CorV	Documented infection	10.9 (6.7-15)	14-120	
									-19.9 (-31.9- -9)	>240	
								Hospitalization	53.8 (43.9-61.9)	14-120	
									40.9 (24.4-53.8)	>240	
								Death	67.4 (39.2-82.5)	14-120	
									50.7 (21.4-69.1)	>240	
234	Richardson et al* (June 19, 2022) *[Update to April 17, 2022 preprint]*	Mexico	Prospective cohort	43,925 childcare workers	Non-VOC, Alpha, Gamma and Delta††	Excluded	CanSino	Documented infection	48 (32-61)	14-60	~33 weeks
									-3 (-26-16)	>120	
								Hospitalization	92 (23-99)	14-60	
									24 (-263-84)	>120	
								Death	95 (53-100)	61-120	
									93 (22-99)	>120	
					Alpha and Gamma††			Documented infection	53 (23-71)	14+	
					Delta^			Documented infection	18 (8-28)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								Hospitalization	74 (38-89)		
								Death	94 (67-99)		
233	Nasreen et al* (August 17,2022) *[Published version of April 13, 2022 preprint]*	Canada	Test-negative case control	31,776 hospitalizations and 5,842 deaths 18+ years	Non-VOC, Alpha, Beta, Gamma, Delta^	Excluded	BNT162b2 or mRNA-1273	Hospitalization or death	98 (95-99)	7-55	~32 weeks
									98 (95-99)	≥112	
							AZD1222		96 (88-96)	7-55	~7 weeks
									97 (91-99)	≥56	
							AZD1222+any mRNA		99 (98-100)	14+	
232	Cerqueira-Silva et al* (July 1, 2022) *[Update to April 13, 2022 preprint]*	Brazil	Test-negative case control	468,804 cases and 430,246 controls 18+ years	**Omicron ^**	Previously infected only	BNT162b2	Symptomatic infection	51.9 (50.0-53.8)	14-69	~59 weeks
									26.2 (22.8-29.4)	140+	
								Hospitalization	59.6 (36.6-74.2)	14-69	
									53.6 (30.2-69.1)	140+	
							AZD1222	Symptomatic infection	25.5 (1.0-29.7)	14-69	
									17 (14.4-19.6)	140+	
								Hospitalization	41 (-8.1-67.8)	14-69	
									55.4 (44.6-64.1)	140+	
							Ad26.COV2.S	Symptomatic infection	16.2 (12.4-19.8)	14+	
								Hospitalization	39.5 (8.3-69)		
							CoronaVac	Symptomatic infection	23.4 (18.2-28.3)	14-69	
									12.3 (9.4-15.1)	140+	
								Hospitalization	34.1 (-28.9-66.3)	14-69	
									34.4 (18.3-47.3)	140+	
			Matched case control			Previously infected only	BNT162b2	Symptomatic infection	54.1 (52.1-55.9)	14-69	
									30.6 (27.3-33.7)	140+	
								Hospitalization	53.6 (-6.4- 79.8)	14-69	
									55.1 (-1.9-80.2)	140+	
							AZD1222	Symptomatic infection	27.2 (22.9-31.3)	14-69	
									15.9 (13.2-18.5)	140+	
								Hospitalization	67.5 (-7.9-90.2)	14-69	
									63.2 (39.0-77.8)	140+	
							Ad26.COV2.S	Symptomatic infection	16.9 (13.2-20.5)	14+	
								Hospitalization	45.4 (-19.6-75.1)		
							CoronaVac	Symptomatic infection	27.3 22.3-31.9)	14-69	
									14.3 (11.4-17.0)	140+	
								Hospitalization	21.4 (-148.4-75.1)	14-69	
									66.4 (37.6-81.9)	140+	
231	Dale et al* (April 12, 2022)	USA	Outbreak investigation	40 cases and 69 controls, 27+ years	Delta specifically^	Excluded	BNT162b2 or mRNA-1273	Documented infection	51(-27-81)	14+	~25 weeks
								Symptomatic infection	67(-7-90)		
								Hospitalization	61(-59-90)		
								Death	80(-10-96)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
230	Plumb et al (April 12,2022)	USA	Test-negative case control	11,283 hospitalized adults	Omicron ^	Included	BNT162b2	Hospitalization	37.3 (25.8–46.9)	14+	~55 weeks
							mRNA-1273		35.9 (21.7–47.4)		
					Delta^		BNT162b2		50.0 (39.0–59.0)		
							mRNA-1273		44.0 (29.9–55.2)		
229	Institute of public health (April 12,2022)	Chile	Test-negative case control	2,181 cases and 979 controls	Lambda, Gamma and Delta^	Included	BNT162b2	Hospitalization with SARI	85.3 (73.5-91.8)	14+	~53 weeks
							CoronaVac		59.5 (49-67.9)		
228	Kildegaard et al* (April 11, 2022)	Denmark	Retrospective cohort	404,975 adolescents aged 12-17 years	Delta^	Excluded	BNT162b2	Documented infection	93 (93-94)	0-59	~13 weeks
227	Kim et al* (July 29, 2022) *[Update to April 10, 2022 preprint*	USA	Test-negative case control	2,208 cases and 1639 controls 18+ years	Omicron specifically^	Included	BNT162b2 or mRNA-1273	Symptomatic disease	45 (14-66)	14-149	~58 weeks
									11 (-21-35)	150+	
					Delta specifically^				89 (78-94)	14-149	~48 weeks
									58 (44-68)	150+	
226#	Buchan et al (April 7,2022)	Canada	Test-negative case control	9,202 cases and 19,953 controls 12-17 years old	Omicron specifically^	Included	BNT162b2	Symptomatic disease	51 (38-61)	7-59	~41 weeks
									29 (17-38)	180+	
								Severe disease	76 (-10-95)	7-59	
									88 (77-94)	180+	~32 weeks
				502 cases and 19,930 controls aged 12-17 years	Delta specifically^			Symptomatic disease	97 (94-99)	7-59	
									90 (79-95)	180+	
225	Paraguay Ministry of Health and Social Welfare (March 22, 2022)	Paraguay	Test-negative case-control	2953 patients ≥ 16 years with severe acute respiratory infection	Gamma and Delta^	Excluded	BBV152	Hospitalization with SARI	27.7 (-10.2-52.6)	14+	~38 weeks
							AZD1222		85.8 (70.6-93.1)		
							Hayat vax		56.4 (15.5-77.6)		
							Sputnik v		77.0 (30.8-92.3)		
							BNT162b2		95.4 (65.7-99.4)		
224	Kwon et al* (April 6,2022)	USA	Test-negative case control	440 solid organ transplant recipients; 1684 patients with other immunocompromising conditions; 8301	Alpha and Delta^	Included	BNT162b2 or mRNA-1273	Hospitalization in solid organ transplant recipient (SOTR)	29 (-19-58)	14+	~37 weeks
								Hospitalization in immunocompromised adults	72 (64-79)		
								Hospitalization in immunocompetent adults	88 (87-90)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				immunocompetent individuals				Supplemental oxygen/ oxygen support in SOTR	31 (-27-63)		
								Supplemental oxygen/ oxygen support in immunocompromised	73 (64-80)		
								Supplemental oxygen/ oxygen support in immunocompetent	90 (89-92)		
223	Yoon et al* (April 6,2022)	USA	Prospective cohort	3241 HCWs	Omicron specifically^	Excluded	BNT162b2 or mRNA-1273	Documented infection	46 (25-61)	14+	~21 weeks
					Delta specifically^				65 (49-76)		
222	Florentino et al* (August 8, 2022) *[Update to April 5, 2022 preprint]*	Brazil	Test-negative case control	503,776 tests among adolescents aged 12-17	Omicron^	Included	BNT162b2	Symptomatic disease	64.7 (63-66.3)	14-27	2 weeks
									5.9 (2.2-9.4)	98+	~21 weeks
								Severe disease	75.6 (58.1-85.8)	14-27	2 weeks
									82.7 (68.8-90.4)	98+	~21 weeks
					Delta^			Symptomatic disease	80.7 (77.8-83.3)	14-27	2 weeks
									26.6 (4.1-43.9)	56-69	~8 weeks
		Scotland		127,168 tests among adolescents aged 12-17	Omicron^			Symptomatic disease	82.6 (80.6-84.5)	14-27	2 weeks
									50.6 (42.7-57.4)	98+	~15.5 weeks
					Delta^			Symptomatic disease	92.8 (85.7-96.4)	14-27	2 weeks
									86.5 (72.2-93.4)	56-69	~8 weeks
221	Ranzani et al* (September 28,2022) *Published version of August 16, 2022 preprint*	Brazil	Test-negative case control	2,107,696 matched pairs of adults aged ≥18 years	Omicron^	Included	CoronaVac	Symptomatic disease	28.1 (26.5-29.6)	14-59	~10 weeks
									6.3 (5.3-7.3)	180+	~59 weeks
								Hospitalization or death	56.1 (40.6-67.5)	14-59	~10 weeks
									57.6 (54.4-60.6)	180+	~59 weeks
					Delta^			Symptomatic disease	51.3 (49.9-52.7)	14-59	~10 weeks
									34 (32.3-35.7)	180+	~59 weeks
								Hospitalization or death	86.5 (83.4-88.9)	14-59	~10 weeks
									60.9 (57.3-64.2)	180+	~59 weeks
220	Nordstrom et al* (March 31, 2022)	Sweden	Retrospective cohort	6,530,128 individuals	Non-VOC, Alpha, Delta^	Previously infected only	BNT162b2 or mRNA-1273	Documented infection	68 (63-72)	14+	~38 weeks
							AZD1222		25 (-37-59)		
219	Pardo-Seco et al* (March 29, 2022)	Spain	Test-negative case control	2,280,288 adults (18+ y) in Galicia	Non-VOC, Alpha††	Excluded	BNT162b2	Documented infection	90.8 (88.6-92.7)	14+	~7.5 weeks
218	Starrfelt et al *(September 2, 2022)	Norway	Retrospective cohort	4,301,995 adults (18+ y)	Delta^	Excluded	BNT162b2	Documented infection	77.7 (76.8-78.5)	2-9 weeks	~7 weeks
									8.2 (3.4-12.8)	>33 weeks	~43 weeks
								Hospitalization	97.5 (95.6-98.6)	2-9 weeks	~7 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	[Published version of March 30, 2022 preprint]								63.9 (54.3-71.5)	>33 weeks	~43 weeks
							mRNA-1273	Documented infection	86.6 (85.6-87.6)	2-9 weeks	~7 weeks
									28.6 (9.6-43.6)	>33 weeks	~43 weeks
								Hospitalization	95.3 (91.5-97.4)	18-25 weeks	~23 weeks
									91.1 (84.9-94.8)	26-33 weeks	~31 weeks
							Heterologous mRNA	Documented infection	84.1 (83.2-85)	2-9 weeks	~7 weeks
									40.7 (23.9-53.8)	18-25 weeks	~23 weeks
217	Marra et al* (March 30, 2022)	Brazil	Retrospective cohort	13,813 HCWs (aged 18+)	Gamma^	Excluded	CoronaVac	Documented infection	51.3 (34.6-63.7)	14+	~23 weeks
							AZD1222		88.1 (82.8-91.7)		~15 weeks
216	Price et al* (March 30, 2022)	USA	Test-negative case control	2812 children aged 5-18	Omicron^	Included	BNT162b2	Hospitalization (12-18 years)	40 (9-60)	14+	~42 weeks
									43 (-1-68)	14-160	~20 weeks
									38 (-3-62)	161-314	~42 weeks
								Hospitalization (5-11 years)	68 (42-82)	14+	~11 weeks
					Delta^			Hospitalization (12-18 years)	92 (89-95)	14+	~42 weeks
									93 (89-95)	14-160	~20 weeks
									92 (80-97_	161-314	~42 weeks
215	Hansen et al (March 30, 2022)	Denmark	Retrospective cohort	3,090,833 participants aged 12+	Omicron^	Excluded	BNT162b2	Documented infection	37 (35.6-38.3)	14-44	~2 weeks
									9.8 (9.2-10.4)	121+	~30 weeks
								Hospitalization	50.5 (33.9-63)	14-44	~2 weeks
									51.6 (47.2-55.6)	121+	~30 weeks
							mRNA-1273	Documented infection	37.9 (34.4-41.2)	14-44	~2 weeks
									13.2 (12.3-14.2)	121+	~30 weeks
214	Natarajan et al (March 29, 2022)	USA	Test-negative case control	80,287 ED/UC encounters and	Omicron^	Included	Ad26.COV2.S	Emergency Dept/ Urgent Care Visits	24 (18-29)	14+	40 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				25,244 hospitalizations among adults with COVID-19 like illness				Hospitalization	31 (21-40)		
213	Wang et al* (November 23, 2022) *[Published version of March 25, 2022 preprint]*	USA	Test-negative case control	295,691 patients hospitalized	Omicron^	Included	Any mRNA vaccine	Documented infection	23 (19-26)	14-179	~23.5 weeks
									-3 (-6-0)	180+	54 weeks
					Delta^				72 (71-74)	14-179	~23.5 weeks
									55 (53-56)	180+	54 weeks
212	Veneti et al* (March 7, 2023) *[Update to March 25, 2022 preprint]*	Norway	Retrospective cohort	117,681 children aged 16-17 years	Omicron^	Excluded	BNT162b2	Documented infections	53.1 (42·6-61.7)	7-34	~12 weeks
									23.3 (2·7–39.5)	≥63	
					Delta^				90.8 (89.1-92.3)	7-34	
									83.7 (75.9-89.0)	≥63	
211	Tenforde et al (March 25,2022)	USA	Case-control	7,544 hospitalised patients	Omicron^	Included	BNT162b2 & mRNA-1273	Invasive mechanical ventilation or in-hospital death	79 (66-87)	14+	~45 weeks
					Delta^				88 (86-90)		
					Alpha, Delta, Omicron^				92 (90-94)	14-150	
									84 (80-87)	>150	
210	Stowe et al* (September 30, 2022) *[Update to April 1, 2022 preprint]*	UK	Test-negative case control	115,720 cases and 294,265 controls	Omicron^	Included	BNT162b2	Hospitalisation with ARI in 18-64 year olds	73.8 (62.5-81.7)	14-174	~43 weeks
									65.1 (51.3-74.9)	175+	
								Hospitalisation with ARI in 65+ year olds	87.6 (79.4-92.5)	14-174	
									65.4 (56.6-72.5)	175+	
							AZD1222	Hospitalisation with ARI in 18-64 year olds	59 (31.9-75.3)	14-174	
									53 (41.7-62)	175+	
								Hospitalisation with ARI in 65+ year olds	71.2 (50-83.4)	14-174	
									53.1 (43.4-61.2)	175+	
209	Horne et al* (July 20, 2022) *[Published version of March 23, 2022 preprint]*	UK	Retrospective cohort	2,041,550 aged 18-39 years	Alpha, Delta, Omicron^	Excluded	BNT162b2	Documented infection	76 (75-77)	21-42	~30 weeks
									-53 (-118- -7)	161-182	
								Hospitalization	96 (94-98)	21-42	
									82 (71-90)	133-154	
				1,161,649 aged 40-64 years			BNT162b2	Documented infection	73 (69-77)	21-42	
									-3 (-15-7)	161-182	
							AZD1222	Documented infection	21 (18-24)	21-42	
									-99 (-105- -94)	161-182	
								Hospitalization	95 (93-96)	21-42	
									86 (83-88)	161-182	
								Death	55 (-5-81)	105-126	
									41 (-7-68)	161-182	
				1,318,688 aged 18-64 years and			BNT162b2	Documented infection	34 (30-39)	21-42	
									4 (-1-8)	161-182	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				clinically vulnerable				Hospitalization	95 (94-97)	49-70	
									91 (88-93)	161-182	
								Death	96 (91-98)	77-98	
									92 (86-96)	161-182	
							AZD1222	Documented infection	34 (30-39)	21-42	
									-45 (-50- -40)	161-182	
								Hospitalization	92 (88-95)	21-42	
									75 (71-78)	161-182	
								Death	92 (88-95)	77-98	
									87 (81-92)	161-182	
				2,072,308 aged 65+ years			BNT162b2	Documented infection	81 (74-86)	21-42	
									15 (8-22)	161-182	
								Hospitalization	91 (86-95)	21-42	
									80 (76-82)	161-182	
								Death	98 (93-99)	21-42	
									88 (84-91)	161-182	
							AZD1222	Documented infection	53 (41-62)	21-42	
									-21 (-30- -13)	161-182	
								Hospitalization	88 (85-90)	21-42	
									75 (71-79)	161-182	
								Death	90 (84-94)	21-42	
									83 (77-88)	161-182	
207	Altarawneh et al* (June 15, 2022) *[Update to March 31, 2022 study]*	Qatar	Test-negative case control	158,484 individuals, all ages	**Omicron BA.1 specifically^**	Previously infected only	BNT162b2	Symptomatic infection	51.7 (43.5-58.7)	14+	44 weeks
								Hospitalization and death	96.2 (37.7-99.8)		
							mRNA-1273	Symptomatic infection	44.3 (30.4-55.4)		
								Hospitalization and death	100 (-51.5-100)		
						Excluded	BNT162b2	Symptomatic infection	-4.9 (-16.4-5.4)		
								Hospitalization and death	96.8 (71.1-99.6)		
							mRNA-1273	Symptomatic infection	-2.7 (-16.8-9.7)		
								Hospitalization and death	88.8 (-1.7-98.8)		
					Omicron BA.2 specifically^	Previously infected only	BNT162b2	Symptomatic infection	55.1 (50.9-58.9)		
								Hospitalization and death	97.8 (82.6-99.7)		
							mRNA-1273	Symptomatic infection	47.9 (40.8-54.1)		
								Hospitalization and death	100 (55.4-100)		
						Excluded	BNT162b2	Symptomatic infection	-1.1 (-7.1-4.6)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								Hospitalization and death	76.8 (58-87.1)		
							mRNA-1273	Symptomatic infection	-7.3 (-15.6-0.3)		
								Hospitalization and death	84.8 (47.9-95.6)		
					Omicron specifically	Previously infected only	BNT162b2	Symptomatic infection	55.5 (51.8-59)		
								Hospitalization and death	94.3 (81.3-98.3)		
							mRNA-1273	Symptomatic infection	52 (45.8-57.4)		
								Hospitalization and death	100 (CI omiited)		
						Excluded	BNT162b2	Symptomatic infection	-0.2 (-5.5-4.9)		
								Hospitalization and death	73.5 (60.5-82.2)		
							mRNA-1273	Symptomatic infection	2.2 (-4.6-8.5)		
								Hospitalization and death	66.3 (38.3-81.6)		
206	Can et al* (March 19, 2022)	Turkey	Retrospective cohort	4067 HCWs	Alpha^	Excluded	CoronaVac	Documented infection	39 (20-64)	14+	13 weeks
205	Rearte et al* (March 15, 2022)	Argentina	Test-negative case control	95,519 cases and 141,811 controls	Alpha, Gamma and Delta††	Excluded	AZD1222	Documented infection	68.5 (67-69)	21+	~26 weeks
								Death	93.7 (93.2-94.3)		
							BBIBP-CorV	Documented infection	43.6 (42-45)		
								Death	85 (84-86)		
							Sputnik-V	Documented infection	64 (63-65)		
								Death	93.1 (92.6-93.5)		
204	Jara et al* (May 23, 2022) *[Published version of March 15, 2022 preprint]*	Chile	Retrospective cohort	490,064 children aged 3-5 years	Omicron specifically^	Excluded	CoronaVac	Documented infection	37.9 (36.1-39.6)	14+	~12 weeks
								Hospitalization	65.2 (50.4-75.6)		
								ICU admission	68.8 (18-88.1)		
203	Baum et al* (November 5, 2022) *[Update to July 6, 2022 preprint*	Finland	Retrospecitve cohort	896,220 older adults (aged 70+)	Non-VOC, Alpha, Delta, Omicron^	Excluded	BNT162b2	Hospitalization	93 (89-95)	14-90	~56 weeks
									69 (63-74)	181+	
								ICU admission	98 (92-99)	14-90	
									79 (65-87)	181+	
							mRNA-1273	Hospitalization	93 (82-97)	14-90	
									73 (59-83)	181+	
								ICU admission	100 (CI omitted)	14-90	
									93 (46-99)	181+	
							AZD1222	Hospitalization	81 (49-93)	14-90	
									48 (17-68)	181+	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								ICU admission	78 (2-95)	14-90	
									64 (-14-89)	181+	
					Delta^		BNT162b2	Hospitalization	90 (78-96)	14-90	~48.5 weeks
									79 (71-84)	181+	
							mRNA-1273		92 (42-99)	14-90	
									87 (70-94)	181+	
							AZD1222		79 (67-87)	91-180	
									23 (-76-67)	181+	
					Omicron^		BNT162b2	Hospitalization	91 (83-95)	14-90	~56 weeks
									58 (48-66)	181+	
							mRNA-1273		79 (43-92)	14-90	
									60 (34-75)	181+	
							AZD1222		37 (-154-85)	91-180	
									51 (12-73)	181+	
202	Shrotri et al (March 12, 2022)	UK	Prospective cohort	15,518 long-term care facility residents	Alpha and Delta^	Excluded	BNT162b2 & mRNA-1273	Documented infection	25.5 (-57.5-64.7)	14-83	45 weeks
									26.3 (-21.7-55.4)	84+	
								Hospitalization	88.8 (16.8-98.5)	14-83	
									65.1 (33.6-81.6)	84+	
								Deaths	100	14-83	
									66.1 (26-84.4)	84+	
							AZD1222	Documented infection	62.1 (12.1-83.6)	14-83	
									13.6 (-33.2-43.9)	84+	
								Hospitalization	82.7 (46.4-94.4)	14-83	
									48.7 (12.5-70)	84+	
								Deaths	91.7 (65.1-98)	14-83	
									61.1 (26.2-79.5)	84+	
				19,515 staff			BNT162b2 & mRNA-1273	Documented infection	60.7 (44.2-72.4)	14-83	
									45.1 (31.3-56.2)	84+	
								Hospitalization	100	14-83	
									92.1 (69.3-97.9)	84+	
							AZD1222	Documented infection	29 (-10.3-54.3)	14-83	
									36.9 (20.6-49.9)	84+	
								Hospitalization	100 (CIs omitted)	14-83	
									89.6 (64.4-96.9)	84+	
201#	Fowlkes et al (March 11,2022)	USA	Prospective cohort	1052 children aged 5-11 years, 312 children aged 12-15 years	Omicron specifically ^	Excluded	BNT162b2	Documented infection 5-11 years	31 (9-48)	14-82	~29 weeks
								Documented infection, 12-15 years	59 (24-78)	14+	
									59(22-79)	14-149	
									62 (-28-89)	≥150	
									81 (51-93)	14+	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
					Delta specifically ^			Documented infection, 12-15 years	87(49-97) 60 (-35-88)	14-149 ≥150	
200	Ashmawy et al* (April 24, 2023) *[Update to March 11, 2022 preprint)*	Egypt	Ambispective cohort	1,228 HCWs	Delta^	Included	BBIBP-CorV	Symptomatic infection Infection Hospitalization	67 (43-80) 46 (24-62) 65 (-8-88)	14+	~29 weeks
199	Oliveira et al* (March 3,2022)	USA	Matched-case control	186 case participants and 356 matched control participants aged 12 to 18 years	Delta^	Excluded	BNT162b2	Documented infection Symptomatic infection Asymptomatic infections	91 (33-99) 83 (34-95) 93 (81-97) 85 (57-95)	1-4 wk 13-17 wk 14+ 14+	~11 weeks
198	Oliver et al* (March 9,2022)	Canada	Retrospective cohort	13,579 individuals in hemodialysis	Alpha^	Excluded	BNT162b2 & mRNA-1273	Documented infection Severe disease Hospitalization Deaths	69 (58-78) 83 (70-90) 82 (69-90) 85 (59-95)	7+	~22 weeks
197	Perry et al* (March 3, 2022)	UK	Retrospective cohort	1,262,689 adults aged 50 or older in Wales	Alpha, Delta^	Included	BNT162b2 AZD1222	Documented infection Hospitalization Documented infection Hospitalization	50 (44-55) 88 (81-93) 25 (15-33) 81 (71-88)	>6	~26.5 weeks ~18 weeks
196	Wright et al* (February 25, 2022)	USA	Case control	9667 cases and 38,668 controls (18 years or older)	Alpha,†† Delta^	Included	BNT162b2 mRNA-1273 Ad26.COV2.S	Severe disease	87.9 (86.7-89) 92.9 (92-93.7) 73 (68.8-76.6)	14+	~40 weeks
195	Klein et al (March 1,2022)	USA	Test-negative case control	39,217 ED and UC encounters and 1,699 hospitalizations among persons aged 5–17 years	**Omicron^**	Unknown	BNT162b2	ED or UC encounters in 5-11 years ED or UC encounters in 12-15 years ED or UC encounters in 16-17 years 	51 (30–65) 45 (30-57) -2 (-25-17) 34 (8-53) -3 (-30-18)	14-67 14-149 150+ 14-149 150+	~33 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
					Delta^	Unknown	BNT162b2	ED or UC encounters in 12-15 years	92 (89-94)	14-149	~33 weeks
									79 (68-86)	150+	
								ED or UC encounters in 16-17 years	85 (81-89)	14-149	
									77 (67-84)	150+	
					Omicron or Delta^			Hospitalizations in 5-11 years	74 (-35-95)	14-67	
								Hospitalizations 12-15 years	92 (79-97)	14-149	
									73 (43-88)	150+	
								Hospitalizations 16-17 years	94 (87-97)	14-149	
									88 (72-95)	150+	
194	Šmíd et al* (October 15, 2022) Correction published Dec 8, 2022 *[Published version of Feb 25, 2022 preprint]*	Czech Republic	Retrospective cohort	10,701,777 individuals, all ages	**Omicron^**	Included	BNT162b2	Documented infection	49 (48-50)	14-74	~54 weeks
									11 (10-12)	135+	
								Hospitalisation	46 (28-60)	14-74	
									34 (24-42)	135+	
							mRNA-1273	Documented infection	48 (44-52)	14-74	
									20 (17-22)	135+	
								Hospitalisation	51 (-20-80)	14-74	
									31 (9-49)	135+	
							AZD1222	Documented infection	51 (23-69)	75-135	
									5 (1-9)	135+	
								Hospitalisation	-139 (-861-41)	75-135	
									13 (-8-30)	135+	
							Ad26.COV2.S	Documented infection	47 (45-49)	14-74	
									35 (33-38)	135+	
								Hospitalisation	28 (-21-56)	14-74	
									37 (8-58)	135+	
					Delta^	Included	BNT162b2	Documented infection	82 (81-83)	14-74	~54 weeks
									54 (53-55)	135+	
								Hospitalisation	80 (72-85)	14-74	
									81 (79-82)	135+	
							mRNA-1273	Documented infection	71 (65-76)	14-74	
									68 (66-69)	135+	
								Hospitalisation	80 (55-91)	75-135	
									82 (78-85)	135+	
							AZD1222	Documented infection	65 (57-72)	75-135	
									45 (43-48)	135+	
								Hospitalisation	80 (62-89)	75-135	
									68 (64-71)	135+	
							Ad26.COV2.S	Documented infection	60 (57-63)	14-74	
									54 (50-57)	135+	
								Hospitalisation	54 (39-65)	14-74	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
									61 (51-69)	135+	
193	Cura-Bilbao et al* (February 2, 2022)	Spain	Prospective cohort	925,915 residents of Aragon, Spain	Non-VOC, Alpha††	Excluded	BNT162b2	Documented infection	70 (65.3-74.1)	7+	~16 weeks
							mRNA-1273		70.3 (52.2-81.5)	14+	
192	Shen et al* (February 23, 2022)	USA	Retrospective cohort	5,536 immuno-suppressed individuals	Non-VOC, Alpha,†† Delta^	Excluded	BNT162b2	Documented infection	41 (9-62)	14+	~36 weeks
							mRNA-1273		48 (18-67)		
							Ad26.COV2.S		66 (-30-91)		
191	Mallow et al* (February 9, 2022)	USA	Test-negative case control	13,203 emergency department patients (aged 18+)	Non-VOC, Alpha,†† Delta^	Unknown	BNT162b2	Emergency department visit	73.9 (66.3-79.8)	14+	~31 weeks
							mRNA-1273		78 (68.1-84.9)		
190	Wu et al (January 10,2022)	China	Retrospective cohort	1,462 close contacts	Delta^	Excluded	BBIBP-CorV	Symptomatic disease	50.5 (3.8-74.6)	14+	~24 weeks
									39.3 (-20.4-69.4)	≤3 mos.	
									82 (-25.7-97.4)	4-6 mos.	
								Pneumonia	54.7 (-3.4-80.2)	14+	
									39.6 (-35.4-73.1)	≤3 mos.	
							CoronaVac	Symptomatic disease	39.1 (-0.9-63.3)	14+	
									45.5 (-5.9-71.9)	≤3 mos.	
									29.8 (-41.1-65.1)	4-6 mos.	
								Pneumonia	64.9 (22.8-84.0)	14+	
									73.8 (17.9-91.6)	≤3 mos.	
									47.4 (-44.3-80.8)	4-6 mos.	
189	Filon et al* (February 15, 2022)	Italy	Retrospective cohort	4251 HCWs	Non-VOC and Alpha††	Excluded	BNT162b2	Documented infection (March)	95 (92-98)	7+	~16 weeks
								Documented infection (April)	95 (92-98)		
								Documented infection (May)	80 (70-84)		
187	Halasa et al* (June 22, 2022) *[Update to February 15, 2022 preprint]*	USA	Test-negative case control	537 case-infants and 512 control-infants< 6 months hospitalized in 20 pediatric hospitals	Delta, **Omicron^**	Included	BNT162b2 & mRNA-1273	Hospitalization in infants with maternal vaccination anytime during pregnancy up to 14 days before delivery	52 (33-65)	14+	~33 weeks
								Hospitalization in infants with maternal vaccination in first 20 weeks of pregnancy	38 (3-60)		
								Hospitalization in infants with maternal	69 (50-80)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								vaccination from 21 weeks up to 14 days before delivery			
					Omicron^			Hospitalization in infants with maternal vaccination anytime during pregnancy up to 14 days before delivery	38 (8-58)		
								Hospitalization in infants with maternal vaccination in first 20 weeks of pregnancy	25 (-26-56)		
								Hospitalization in infants with maternal vaccination from 21 weeks up to 14 days before delivery	57 (25-75)		
					Delta^			Hospitalization in infants with maternal vaccination anytime during pregnancy up to 14 days before delivery	80 (60-90)		
								Hospitalization in infants with maternal vaccination in first 20 weeks of pregnancy	68 (19-87)		
								Hospitalization in infants with maternal vaccination from 21 weeks up to 14 days before delivery	88 (68-96)		
186	Jara et al* (April 20, 2023) *[Update to February 15, 2022 preprint]*	Chile	Prospective cohort	1,976,344 children aged 6-16 years	Delta^	Excluded	CoronaVac	Documented infection (6-16 years)	74.8 (74.1-75.5)	14+	~28 weeks
								Documented infection (6-11 years)	75.8 (74.8-76.8)		
								Documented infection (12-16 years)	73.6 (72.5-74.6)		
								Hospitalization (6-16 years)	91.3 (88.1-93.6)		
								Hospitalization (6-11 years)	78.5 (62.8-87.6)		
								Hospitalization	93.4 (90.4-95.5)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								(12-16 years)			
								ICU admission (6-16 years)	93.8 (85.7-97.3)		
							BNT162b2	Documented infection (12-16 years)	84.4 (83.7-85.0)		~30 weeks
								Hospitalization (12-16 years)	93.5 (90.4-95.6)		
								ICU admission (12-16 years)	98.0 (89.9-99.6)		
185	Ferdinands et al (February 11, 2022)	USA	Test-negative case control	241,204 ED/UC encounters and 93,408 hospitalizations	Omicron^	Included	BNT162b2 & mRNA-1273	ED or UC encounters	69 (62–75)	< 2 mos	~53 weeks
									37 (34–40)	≥5 mos	
								Hospitalization	71 (51–83)	< 2 mos	
									54 (48–59)	≥5 mos	
					Delta^			ED or UC encounters	92 (91–94)	< 2 mos	~25 weeks
									77 (76–78)	≥5 mos	
								Hospitalization	94 (92–96)	< 2 mos	
									82 (82–83)	≥5 mos	
184	Goldin et al* (February 8, 2022)	Israel	Retrospective cohort	43,596 residents of long-term care facilities (65+ years)	Non-VOC, Alpha††	Excluded	BNT162b2	Documented infection	81.2 (78.6-83.5)	7+	~16.5 weeks
								Death	85.3 (80.4-88.9)	7+	
183	Hayek et al* (January 27, 2022)	Israel	Retrospective cohort	155,305 households with 400,733 children	Alpha^	Excluded	BNT162b2	Documented infection	94.4 (93.2-95.4)	7+	~12 weeks
182	ECDC (January 20, 2022)	Belgium, Croatia, Czechia, France, Greece, Malta, Portugal and Spain	Test-negative case control	1893 hospitalised patients	Alpha^	Excluded	BNT162b2	Hospitalization	94 (88-97)	14+	~28 weeks
181	Butt et al* (February 9, 2022)	USA	Test-negative case control	4,229 cases and controls on haemodialysis	Delta^	Excluded	BNT162b2	Documented infection	68.9 (61.9-74.7)	14+	~31 weeks
							mRNA-1273		66.7 (58.9-73.0)		
180	Cerqueira-Silva et al* (February 9,2022)	Brazil	Test-negative case control	7,747,121 individuals	Gamma and Delta^	Excluded	CoronaVac	Documented infection	55 (54.3-55.7)	14-30	~30 weeks
									34.7 (33.1-36.3)	>180	
								Severe disease	82.1 (81.4-82.8)	14-30	
									72.6 (71.0-74.2)	>180	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								Hospitalization	82.1 (81.4-82.8)	14-30	
									72.4 (70.7-73.9)	>180	
								Death	82.7 (81.7-83.6)	14-30	
									74.8 (72.2-77.2)	>180	
179#	Chemaitelly et al* (June 2, 2022) *[Published version of March 13,2022 preprint]*	Qatar	Test-negative case control	2,706,008 individuals	**Omicron BA.1 specifically^**	Included	BNT162b2	Symptomatic disease	46.6(33.4-57.2)	1-3 mo	~58 weeks
									-17.8(-28.2- -8.2)	7+ mo.	
							mRNA-1273		71.0 (24.0- 89.0)	1-3 mo	
									-10.2 (-23.1-1.3)	7+ mo.	
					Omicron BA.2 specifically^		BNT162b2		51.7 (43.2-58.9)	1-3 mo	
									-12.1 (-19.1-5.5)	7+ mo.	
							mRNA-1273		35.9 (-5.9-61.2)	1-3 mo	
									-20.4 (-30.2-1.2)	7+ mo.	
					Omicron specifically^		BNT162b2	Symptomatic disease	51.7(43.2-58.9)	1-3 mo	
									-9.0 (-14.5- -3.7)	7+ mo.	
							mRNA-1273		43.2(15-62.1)	1-3 mo	
									-13.7(-21.3- -6.6)	7+ mo.	
							BNT162b2	Severe, critical or fatal	70.4 (45.0-84.0))	1-6 mo	
									77.5 (67.8-84.3)	7+ mo.	
							mRNA-1273		87.1 (40.2-97.2)	1-6 mo	
									68.4 (46.1-81.5)	7+ mo.	
178	Lauring et al* (March 9, 2022) [February 7,2022]	USA	Test-negative case control	5582 COVID-19 cases and 5962 test-negative and syndrome negative controls	**Omicron specifically^**	Excluded	BNT162b2 & mRNA-1273	Hospitalization	65 (51-75)	14+	~3 weeks
					Delta specifically^		BNT162b2 & mRNA-1273		85 (83-87)	≤150	~27 weeks
									90 (85-93)	>150	
							BNT162b2		82 (80-84)	14+-	
							mRNA-1273		88 (86-90)		
					Alpha specifically^		BNT162b2		82 (77-86)		~44 weeks
							mRNA-1273		90 (85-93)		
177	Suryatma et al (March 11,2022) *[Update to February 3 preprint]*	Indonesia	Test-negative case control	14,168 adults aged ≥18	Non-VOC, Alpha††	Excluded	CoronaVac	Documented infection	66.7 (58.1-73.5)	14+	~24 weeks
								Hospitalization	71.1 (62.9-77.6)		
								Death	87.4 (65.1-95.4)		
176	Sritipsukho et al* (February 3,2022)	Thailand	Test-negative case control	1,118 cases and 2,235 controls	Delta^	Excluded	AZD1222	Documented infection	83 (70-90)	14+	~13 weeks
							CoronaVac		60 (49-69)		
							CoronaVac + AZD1222		74 (43-88)		
175	Roberts et al (July 26, 2022)	USA	Test-negative case control	74,060 adults	Non-VOC, Alpha, Delta††	Included	BNT162b2	Documented infection (Overall)	83 (81-84)	<3 mos.	~48 weeks
									60 (58-62)	≥3 mos.	
								Documented infection (Jan-March)	80 (74-85)	<3 mos.	
									80.5 (74-86)	≥3 mos.	
									75 (64-81)	<3 mos.	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	[Published version of January 31, 2022 preprint]							Documented infection (Oct-Dec)	60 (55-62)	≥3 mos.	
								Severe disease (Overall)	88 (80-91)	<3 mos.	
									75 (70-80)	≥3 mos.	
								Severe disease (Jan-March)	90 (49-99)	<3 mos.	
									90 (50-99)	≥3 mos.	
								Severe disease (Oct-Dec)	69 (22-88)	<3 mos.	
									78 (70-82)	≥3 mos.	
							mRNA-1273	Documented infection (Overall)	88 (85-90)	<3 mos.	
									65 (62-68)	≥3 mos.	
								Documented infection (Jan-March)	89 (73-95)	<3 mos.	
									89 (74-93)	≥3 mos.	
								Documented infection (Oct-Dec)	82 (69-91)	<3 mos.	
									68 (64-69)	≥3 mos.	
								Severe disease (Overall)	85 (75-90)	<3 mos.	
									72 (65-78)	≥3 mos.	
								Severe disease (Jan-March)	70 (0-95)	<3 mos.	
									70 (0-93)	≥3 mos.	
								Severe disease (Oct-Dec)	91 (5-99)	<3 mos.	
									80 (72-88)	≥3 mos.	
174	Lytras et al* (June 14, 2022) *[Published version of January 29,2022 preprint]*	Greece	Retrospective cohort	9100 COVID-19 intubations and 14755 COVID-19 deaths in Greece aged ≥15 years	Delta^	Included	BNT162b2	Intubation (age 15-59)	98.1 (97.5-98.6)	14+	~ 48 weeks
									95.5 (94.3–96.5)	6 mos	
								Intubation (age 60-79)	96.7 (95.9–97.4)	14+	
									92 (91.0–92.9)	6 mos	
								Intubation (age 80+)	94.2 (92.0–95.7)	14+	
									85.9 (83.5–88.0)	6 mos	
								Death (age 15-59)	96.5 (94.8–97.6)	14+	
									93.8 (91.0–95.7)	6 mos	
								Death (age 60-79)	94.1 (92.7–95.2)	14+	
									89.4 (87.9–90.8)	6 mos	
								Death (age 80+)	91 (88.4–93.0)	14+	
									84 (82.2–85.6)	6 mos	
							mRNA-1273	Intubation (age 15-59)	99.4 (98.2-99.8)	14+	
									97.3 (93.1-98.9)	6 mos	
								Intubation (age 60-79)	98.9 (97.3–99.5)	14+	
									95.1 (93-96.5)	6 mos	
								Intubation (age 80+)	97.9 (90.2–99.5)	14+	
									90.6 (67-97.3)	6 mos	
								Death (age 15-59)	99.3 (94.7-99.9)	14+	
									98.3 (88.3-99.8)	6 mos	
								Death	98.4 (95.5–99.5)	14+	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								(age 60-79)	96.2 (93.6–97.7)	6 mos	
								Death (age 80+)	96.7 (87.9–99.1)	14+	
									92 (80–96.8)	6 mos	
							AZD1222	Intubation (age 15-59)	97.8 (95.3-99)	14+	
									92.4 (84-96.4)	6 mos	
								Intubation (age 60-79)	97.2 (95.3–98.3)	14+	
									90.3 (87.4-92.5)	6 mos	
								Intubation (age 80+)	97.8 (91.7–99.4)	14+	
									92.4 (72.7–97.9)	6 mos	
								Death (age 15-59)	97.5 (89.7-99.4)	14+	
									94.5 (77.2-98.7)	6 mos	
								Death (age 60-79)	95.4 (91.2–97.6)	14+	
									89.8 (85.2–93.0)	6 mos	
								Death (age 80+)	92.6 (84.2–96.5)	14+	
									83.4 (69.6–90.9)	6 mos	
							Ad26.COV2.S	Intubation (age 15-59)	85.0 (73.9–91.4)	14+	
									91.7 (84.4-95.6)	6 mos	
								Intubation (age 60-79)	79.6 (65.2–88.0)	14+	
									88.7 (78.7-94)	6 mos	
								Intubation (age 80+)	85.0 (62.3–94.0)	14+	
									91.7 (75.5-97.2)	6 mos	
								Death (age 15-59)	81.7 (57.5–92.1)	14+	
									90.7 (77.2-96.2)	6 mos	
								Death (age 60-79)	69.1 (43.2–83.2)	14+	
									84.3 (67.9-92.3)	6 mos	
								Death (age 80+)	61.9 (43.2–74.4)	14+	
									80.6 (59.7–90.7)	6 mos	
173	Tenforde et al* (January 28, 2022)	USA	Test-negative case control	2952 hospitalized adults (18+ y)	Delta^	Included	BNT162b2 or mRNA-1273	Hospitalization: Immunocompromised	69 (57-78)	14+ up to <7 days pose dose 3	~47 weeks
								Hospitalization: Non-immunocompromised	82 (77-86)		
172	Belayachi et al* (December 7, 2022) *[Update to January 27, 2021 preprint]*	Morocco	Test-negative case control	25,768 matched pairs of patients aged 18+	Non-VOC, Alpha, Delta††	Included	BBIBP-CorV	Severe hospitalisation	73 (71-76)	1-273	~39 weeks
									88 (84-91)	1-30	
									64 (59-69)	150+	
171#	Willet et al (January 26,2021)	Scotland	Test-negative case control	6166 Omicron cases and 4911 Delta cases	**Omicron specifically^**	Included	BNT162b2	Documented infection	26.0 (13.9-36.4)	14+	~11 weeks
							mRNA-1273		23.7 (4.4-39.4)		
							AZD1222		11.4 (-18.8-34.6)		
					Delta specifically^		BNT162b2		83.5 (78.6-87.3)		
							mRNA-1273		87.8 (79.8-92.7)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
							AZD1222		78.9 (66.6-86.7)		
170	Spensley et al* (January 26, 2022)	UK	Prospective cohort	1121 end stage kidney disease patients receiving in-center haemodialysis	**Omicron specifically^**	Included	BNT162b2	Documented infection	17 (-62-57)	14+	~52.5 weeks
							AZD1222		-4 (-97-43)		
169	Botton et al* (January 24, 2022)	France	Retrospective cohort	4,053,569 elderly adults (aged 75+)	Non-VOC, Alpha††	Unknown	BNT162b2 & mRNA-1273	Hospitalization	86 (83-89)	7+	~7 weeks
168	Bedston et al* (January 21, 2022)	UK	Prospective cohort	93,292 HCWs	Alpha^	Excluded	BNT162b2	Documented infection	86 (74-91)	2-5 weeks	~37 weeks
									45 (39-51)	26+ weeks	
167	Thompson et al (January 21,2022)	USA	Test-negative case control	222,772 ED encounters and 87,904 hospitalization	**Omicron^**	Unknown	BNT162b2 & mRNA-1273	ED or UC encounters	52 (46-58)	14-179	~50 weeks
									38 (32-43)	≥180	
								Hospitalisation	81 (65-90)	14-179	
									57 (39-70)	≥180	
					Delta^			ED or UC encounters	86 (85-87)	14-179	~32 weeks
									76 (75-77)	≥180	
								Hospitalisation	90 (89-90)	14-179	
									81(80-82)	≥180	
166	Amodio et al* (March 11,2022) [Published version od January 13,2022 preprint]	Italy	Retrospective cohort	3,966,976 adults aged≥ 18 years	Alpha, Delta††	Excluded	BNT162b2 & mRNA-1273	Documented infection	81.3 (80.3-82.3)	2 months	~37 weeks
									57.8 (55.4-60.2)	8 months	
								Severe disease	96.1 (94.5-97.7)	2 months	
									90.3 (86.2-94.4)	8 months	
								Death or intubation	93.4 (91.2-95.6)	2 months	
									83.7 (75.1-92.3)	8 months	
165#	Tartof et al* (April 22, 2022) *[Update to January 18, 2022 preprint]*	USA	Test-negative case control	11,123 patients with ED or hospital encounter in Southern California	**Omicron specifically^**	Included	BNT162b2	ED admission	47 (40-54)	7+	~47 weeks
									64 (51-73)	7 to <3 mos	
									31 (16-43)	≥9 mos	
								Hospitalisation	62 (53-69)	7+	
									68 (48-80)	7 to <3 mos	
									41 (21-55)	≥9 mos	
					Delta specifically^			ED admission	61 (55-66)	7+	
									78 (69-85)	7 to <3 mos	
									57 (45-66)	≥9 mos	
								Hospitalisation	76 (69-82)	7+	
									78 (55-89)	7 to <3 mos	
									73 (58-83)	≥9 mos	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
164	Young-Xu et al* (August 3, 2022) *[Update to March 13, 2022 preprint]*	USA	Matched test-negative case control	37,117 veterans 18 years or older as cases and 434,096 as controls	Omicron specifically^	Excluded	BNT162b2 & mRNA-1273	Documented infection	12 (10-15)	14+	~~48 weeks
								Hospitalization	63 (58-67)		
								Death	77 (67-83)		
					Delta specifically^			Documented infection	54 (50-57)		
								Hospitalization	75 (69-80)		
								Death	92 (83-96)		
163	Suah et al* (March 21, 2022) *[Update to (January 16,2022 preprint]*	Malaysia	Retrospective cohort	9,926,361 vaccinated individuals aged ≥15, and unvaccinated controls	Delta^	Excluded	BNT162b2	Documented infection: Vaccinated April to June	79.3 (76.1-82.1)	9-26 weeks	~26 weeks
								Documented infection: Vaccinated July to August	90.8 (89.4-92.1)	2-13 weeks	
							CoronaVac	Documented infection: Vaccinated April to June	30.4 (18.8-40.3)	9-26 weeks	
								Documented infection: Vaccinated July to August	74.5 (70.6-78)	2-13 weeks	
162	Gazit et al* (November 24, 2021)	Israel	Retrospective cohort	4024 adult household members of SARS-CoV-2 index cases	Alpha^	Excluded	BNT162b2	Documented infection	80.3 (73.5-85.4)	7+	~7.5 weeks
161	Olson et al* (January 12,2022)	USA	Case control	445 case patients and 777 control patients aged 12-18 years	Delta^	Unknown	BNT162b2	Hospitalization	94 (90-96)	14+	~18 weeks
								ICU admission	98 (93-99)		
			Test-negative case control					Hospitalization	95 (91-97)		
								ICU admission	98 (94-100)		
160	Chiew et al* (September 28, 2022) *[Update to January 8, 2022 preprint]*	Singapore	Retrospective cohort	249,763 adolescents aged 12-17	Omicron^	Excluded	BNT162b2	Documented infection	25 (21-29)	8+	~44 weeks
									38 (32-43)	8-59	
									40 (34-46)	240+	
								Hospitalization	75 (56-86)	8+	
									74 (26-91)	8-59	
									77 (54-89)	210-239	
					Delta^			Documented infection	66 (63-69)	8+	~24 weeks
									71 (67-74)	8-59	
									57 (27-75)	150-179	
								Hospitalization	83 (74-89)	8+	
									76 (62-85)	8-59	
									89 (64-94)	120-149	
159#		USA				Included	mRNA-1273	Documented infection	13.9 (10.5-17.1)	14+	~47.5 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	Tseng et al* (February 21, 2022) *[update from January 21 preprint]*		Test-negative case control	26,683 cases and 109,662 controls among Kaiser Permanente Southern California members aged 18+	**Omicron specifically^**				44 (35.1-51.6)	14-90	~11 weeks
									5.9 (0.4-11.0)	>270	~47.5 weeks
								Hospitalization	84.5 (23-96.9)	14+	
					Delta specifically^			Documented infection	63.6 (59.9-66.9)	14+	
									80.2 (68.2-87.7)	14-90	~11 weeks
									61.3 (55-66.7)	>270	~47.5 weeks
								Hospitalization	99 (93.3-99.9)	14+	
158	Zambrano et al (January 7,2022)	USA	Test-negative case control	102 MIS-C case-patients and 181 hospitalized controls aged 12-18 years	Delta^	Included	BNT162b2	MIS-C	86 (70-93)	14+	~23 weeks
									91 (78-97)	28+	
						Excluded			90 (75-96)		
157	Prunas et al* December 9, 2022 *[Update to January 5, 2022 preprint]*	Israel	Matched Case-control	11,822 cases and 226,201 controls aged 12-16 years	Delta^	Excluded	BNT162b2	Documented infection	85 (84-86)	14-89	~25 weeks
									53 (46-60)	150-180	
								Symptomatic disease	90 (89-91)	14-89	
									66 (59-72)	150-180	
			Test negative case control					Documented infection	84 (82-85)	14-89	
									50 (43-57)	150-180	
156	Petráš et al* (December 22, 2021)	Czech Republic	Retrospective cohort	11,016 staff of three hospitals in Prague	Alpha, Delta††	Excluded	BNT162b2	Documented infection: Overall	88.3 (83.2-91.8)	>14	~30 weeks
								Symptomatic disease: Overall	91.7 (85.7-95.2)		
					Alpha††			Documented infection: February 2021	96.2 (91.6-98.7)		4 weeks
					Delta††			Documented infection: June-Aug 2021	65 (<0-96.6)		~30 weeks
155	Cerqueira-Silva et al* (March 31, 2022) *(Update to December 27, 2021 preprint]*	Brazil	Test negative case control	22,566 cases and 68,426 test-negative individuals aged 18+ with prior SARS-CoV-2 infection	Non-VOC, Gamma, Delta^	All participants had confirmed prior infection	CoronaVac	Symptomatic reinfection	39.4 (36.1-42.6)	14+	~37 weeks
									40.5 (36.4-44.3)	14-90	~11 weeks
									38 (33.1-42.5)	>90	~37 weeks
								Hospitalization or death	81.3 (75.3-85.8)	14+	
									86.6 (79.8-90.3)	14-90	~11 weeks
									74.4 (63.3-82.2)	>90	~37 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
							AZD1222	Symptomatic reinfection	56 (51.4-60.2)	14+	
									55.5 (50.5-60.1)	14-90	~11 weeks
									56.8 (46.6-65.1)	>90	~37 weeks
								Hospitalization or death	89.9 (83.5-93.8)	14+	
									86.6 (77.6-92.0)	14-90	~11 weeks
									95.1 (84.8-98.4)	>90	~37 weeks
							BNT162b2	Symptomatic reinfection	64.8 (54.9-72.4)	14+	
									64.2 (54.2-72)	14-90	~11 weeks
									100 (CI omitted)	>90	~37 weeks
								Hospitalization or death	89.7 (54.3-97.7)	14+	
									88.8 (50-97.5)	14-90	~11 weeks
									100 (CI omitted)	>90	~37 weeks
							Ad26.COV2.S	Symptomatic reinfection	44 (31.5-54.2)	14+	
									46.1 (32.7-56.7)	14-90	~11 weeks
									30.6 (-12.4-57.1)	>90	~37 weeks
								Hospitalization or death	57.7 (-2.6-82.5)	14+	
									60.2 (-10.8-85.7)	14-90	~11 weeks
									41 (-240.9-89.9)	>90	~37 weeks
153	Chung et al* (January 1,2022)	USA	Test negative case control	3,384 individuals aged ≥12 years	Non-VOC, Alpha, Delta^	Included	BNT162b2	Symptomatic disease	66(56-73)	14+	~34 weeks
							mRNA-1273		81(73-86)		
152	Lutrick et al (December 31,2021)	USA	Prospective cohort	243 individuals aged 12-17 years	Delta^	Excluded	BNT162b2	Documented infection	92(79-97)	14+	~17 weeks
151#	Collie et al* (December 29, 2021)	South Africa	Test negative case control	211,610 PCR tests of individuals In Gauteng Province	**Omicron specifically^**	Included	BNT162b2	Hospitalization	69 (48-81)	14+	~24 weeks
					Delta^				93 (90-94)		~19 weeks
150	Mendola et al* (December 23, 2021)	Italy	Retrospective cohort	2,478 HCWs 18+ years at a public hospital	Alpha††	Excluded	BNT162b2	Documented infection	89 (78-95)	8-98	~12 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
149	Alali et al* (December 7, 2021)	Kuwait	Retrospective cohort	3,246 HCWs 20+ years at a secondary hospital	Alpha††	Excluded	AZD1222	Symptomatic disease	94.5 (89.4 – 97.2)	14+	~20 weeks
148	Ostropolets et al* (August 23, 2022) *[Update to December 25, 2021 preprint]*	USA	Retrospective cohort	179,666 patients of Columbia University Medical Center	Non-VOC, Alpha, Delta††	Excluded	BNT162b2	Documented infection	94 (91-95)	14+	52 weeks
								Hospitalization	95 (92-97)		
							mRNA-1273	Documented infection	97 (94-98)		
								Hospitalization	96 (92-99)		
							Ad26.COV2.S	Documented infection	81 (50-94)		
								Hospitalization	92 (58-100)		
147	Amir et al (December 21, 2021)	Israel	Quasi-experimental	348,468 individuals aged 16-18 and 361,050 individuals aged 12-14	Delta^	Excluded	BNT162b2	Documented infection: 12-14 years	92 (91.1-92.8)	14-60	~6.5 weeks
								Documented infection: 16-18 years	89.8 (80-93.8)		
146	Katikireddi et al* (December 20, 2021)	Scotland	Retrospective cohort	2,534,527 adults (aged 18+)	Delta^	Excluded	AZD1222	Hospitalization or death	83.7 (79.7-87.0)	14-27	~20 weeks
									53.6 (48.4-58.3)	140-153	
145	Kissling et al* (May 26,2022) *[Published version of December 23,2021 preprint]*	Croatia, France, Ireland, Netherlands, Portugal, Romania, Spain, and the UK	Test negative case control	2,725 cases and 11,557 controls aged 30+	Delta^	Included	BNT162b2	Symptomatic disease (30-59 years)	87 (83–89)	14-29	~30 weeks
									65 (56–71)	90+	
								Symptomatic disease (60+ years)	65 (37-80)	30-59	
									64 (44-77)	90+	
							mRNA-1273	Symptomatic disease (30-59 years)	98 (93–100)	14-29	
									90 (76–96)	60-89	
							AZD1222		72 (52–83)	14-29	
									65 (48–76)	60-89	
							Ad26.COV2.S		50 (36–62)	30–59	
									52 (33–66)	60-89	
144#	Hansen et al (December 23,2021)	Denmark	Retrospective cohort	41,684 Danish residents aged ≥12 years	**Omicron specifically^**	Excluded	BNT162b2	Documented infection	55.2 (23.5-73.7)	15-44	21 weeks
									-76.5 (-95.3, -59.5)	105-164	
							mRNA-1273		36.7 (-69.9-76.4)	15-44	
									-39.3 (-61.6, -20)	105-164	
					Delta specifically^		BNT162b2		86.7 (84.6-88.6)	15-44	
									53.8 (52.9-54.6)	105-164	
							mRNA-1273		88.2 (83.1–91.8)	15-44	
									65.0 (63.6- 66.3)	105-164	
143	Ioannou et al (December 21,2021)	USA	Retrospective cohort/ Target trial emulation	4,199,742 individuals	Non-VOC and Alpha ††	Excluded	BNT162b2 & mRNA-1273	Documented infection (March 31st 2021)	65 (63–68)	7+	~28 weeks
								Documented infection (June 30tht 2021)	69 (67–70)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								Death (March 31st 2021)	89 (84–92)		
								Death (June 30tht 2021)	86 (82–89)		
142	Lewis et al* (December 21,2021)	USA	Test negative case control	3,619 adults	Alpha and Delta††	Included	BNT162b2 & mRNA-1273	Hospitalization with no underlying conditions	96 (93-98)	14+	~30 weeks
								Hospitalization with one underlying conditions	93 (89-95)		
								Hospitalization with 2 underlying conditions	87 (92-91)		
								Hospitalization with 3+ underlying conditions	83 (72-88)		
141	Tartof et al* (February 14, 2021) *[Updated version of previous December 21st preprint]*	USA	Retrospective matched cohort	3,133,075 adults ≥ 18 years	Non-VOC, Alpha and Delta††	Included	BNT162b2	Documented infection	85 (83-86)	7-36	~48 weeks
									49 (46-51)	217+	
								Hospitalization	90 (86-92)	7-36	
									88 (85-90)	217+	
140#	Bekker et al*(March 19,2022) *[Published version of December 20,2021]*	South Africa	Retrospective matched cohort	477,234 HCWs	Beta, Delta, Kappa^	Included	Ad26.COV2.S	Hospitalization	67 (62-71)	28+	16 weeks
								ICU/CCU admission	75 (69-82)		
								Death	83 (75-89)		
					Beta^			Hospitalization	62 (42-76)		
								ICU/CCU admission	49 (8-77)		
								Death	86 (57-100)		
					Delta^			Hospitalization	67 (62-71)		
								ICU/CCU admission	78 (71-88)		
								Death	82 (74-89)		
139	Abu-Raddad et al* (January 21, 2022) Published version of December 16,2021	Qatar	Test negative case control	107,099 test-positive cases and 658,564 test-negative controls	Beta and Delta^	Excluded	mRNA-1273	Documented infection	85.3 (83.5-86.9)	30+	~35 weeks
									-29.5 (-84-8.8)	240+	
								Symptomatic disease	94.4 (92.8-95.6)	30+	
									20 (-29-59.3)	240+	
								Asymptomatic disease	79.9 (75.5-83.4)	30+	
									-28.4 (-129.3-28.1)	240+	
								Hospitalization and death	97.2 (92.4-99)	30+	
									61 (-225.5-95.3)	180+	
138	McLean et al* (February 18,2022)	USA	Prospective cohort	1,518 individuals aged ≥12 years	Non-VOC, Alpha and Delta††	Included	BNT162b2	Symptomatic and asymptomatic infections	50 (21-69)	14+	~52 weeks
							mRNA-1273		65 (37-81)		
							BNT162b2	Symptomatic infections	54 (26-71)		
							mRNA-1273		65 (38-81)		
						Excluded	BNT162b2	Symptomatic and asymptomatic infections	51 (22-70)		
							mRNA-1273		66 (38-82)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	Published version of pre-print from December 16,2021				Delta specifically^	Excluded	BNT162b2	Symptomatic and asymptomatic infections	52 (20-71)		
							mRNA-1273		59 (24-78)		
137	Castillo-Arregoces et al (December 16,2021)	Colombia	Retrospective matched cohort	2,828,294 individuals aged 60+	Mu^	Excluded	BNT162b2	Hospitalization without death	83 (78.4-86.6)	14+	32 weeks
								Post-hospitalization death	94.8 (93.3 – 96)		
								Death	88.3 (84.1-91.4)		
							AZD1222	Hospitalization without death	90.8 (85.5-94.2)		
								Post-hospitalization death	97.5 (95.8-98.5)		
								Death	93.9 (89.3-96.6)		
							Ad26.COV2.S	Hospitalization without death	60.9 (36.8-75.8)		
								Post-hospitalization death	85.8 (77.1-91.2)		
								Death	95.5 (82.0- 98.9)		
							CoronaVac	Hospitalization without death	47.3 (41.9-52.3)		
								Post-hospitalization death	72.1 (70.1-73.9)		
								Death	64.9 (61.2-68.9)		
136	Young-Xu et al* (December 15, 2021) *Updated analysis of reference #45*	USA	Test negative case control	71,190 male veterans aged 65+ in the Veterans Health Administration	Non-VOC and Alpha †† (pre-Delta)^	Excluded	BNT162b2 & mRNA-1273	Documented infection	94.5 (90.7-96.7)	14-43	4 weeks
									87.9 (85.9-89.5)	74-103	12 weeks
					Alpha, Delta†† (rising Delta)^				92.1 (87.2-95.1)	14-43	4 weeks
									67.3 (63.2-70.9)	134-163	20 weeks
					Delta^				62.0 (45.6-73.5)	14-43	4 weeks
									24.8 (18.8-30.4)	224-253	32 weeks
135	Florea et al* (April 28, 2022) *Updated interim analysis of reference #86*	USA	Prospective cohort	927,004 matched pairs of adult (18+) Kaiser Permanente members in	Non-VOC, Alpha, Delta††	Included	mRNA-1273	Documented infection	82.8 (82.2-83.3)	14+	~35 weeks
									88.0 (86.8-89.1)	14-60	~6.5 weeks
									75.5 (70.4-79.7)	180-240	~35 weeks
								Hospitalization	96.1 (95.5-96.6)	14+	
									95.9 (93.5-97.4)	14-60	~6.5 weeks
									94.5 (90.9-96.7)	180-240	~35 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				Southern California				Death in hospital	97.2 (94.8-98.4)	14+	
					Delta^			Documented infection	86.5 (84.8-88.0)	14+	~15 weeks
134	Machado et al* (September 13, 2022) [Update to December 14,2021 preprint]	Portugal	Retrospective cohort	1,884,932 adults aged 65+	Alpha and Delta^	Excluded	BNT162b2 and mRNA-1273	Symptomatic infection in 65-79 years old	79 (76-83)	14-41	~29 weeks
									39 (29-48)	98+	
								Symptomatic infection in 80+ years old	72 (61-79)	14-41	
									34 (29-48)	124+	
								Hospitalization in 65-79 years old	95 (90-97)	14-41	
									93 (86-96)	70+	
								Hospitalization in 80+ years old	83 (68-91)	14-41	
									63 (37-78)	124+	
								Death in 65-79 years old	95 (88-98)	14-41	
									93 (87-96)	70+	
								Death in 80+ years old	87 (71-93)	14-41	
									75 (64-82)	124+	
							AZD1222	Symptomatic infection in 65-79 years old	95 (90-97)	14-41	
									93 (86-96)	70+	
								Hospitalization in 65-79 years old	89 (52-94)	14+	
								Death in 65-79 years old	95 (90-97)		
133	Berec et al* (July 8,2022) *[Published version of December 12th preprint]*	Czech Republic	Retrospective cohort	6,287,356 individuals ≥ 12 years	Alpha and Delta^	Included	BNT162b2	Documented infection	87 (86-87)	0-2 mos.	~35 weeks
									53 (52-54)	7-8 mos.	
								Hospitalization	90 (89-91)	0-2 mos.	
									75 (73-76)	7-8 mos.	
								Death	92 (90-93)	0-2 mos.	
									83 (81-86)	7-8 mos.	
							mRNA-1273	Documented infection	90 (89-91)	0-2 mos.	
									65 (63-67)	7-8 mos.	
								Hospitalization	94 (92-96)	0-2 mos.	
									81 (78-84)	7-8 mos.	
								Death	96 (91-98)	0-2 mos.	
									88 (82-92)	7-8 mos.	
							AZD1222	Documented infection	83 (80-85)	0-2 mos.	
									55 (54-56)	5-6 mos.	
								Hospitalization	87 (81-91)	0-2 mos.	
									70 (68-72)	5-6 mos.	
								Death	93 (77-98)	0-2 mos.	
									82 (78-85)	5-6 mos.	
							Ad26.COV2.S	Documented infection	68 (66-70)	0-2 mos.	
									67 (65-69)	5-6 mos.	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								Hospitalization	68 (60-75)	2 months	
									67 (62-72)	5-6 mos.	
								Death	68 (42-82)	2 months	
									68 (53-78)	5-6 mos.	
132	Powell et al* (March 21, 2022) *[Update to February 18, 2022 preprint]*	UK	Test-negative case control	617,259 eligible tests for 12-15-year-olds and 225,670 for 16-17-year-olds	**Omicron specifically^**	Excluded	BNT162b2	Symptomatic disease(12-15 years)	73(66.4-78.3)	14+	~33 weeks
								Symptomatic disease(16-17 years)	71.3(69.3-73.1)	14-34	
									22.6(14.5-29.9)	70+	
					Delta specifically^			Symptomatic disease(12-15 years)	87.2(73.7-93.8)	14+	
								Symptomatic disease(16-17 years)	93.1 (91.6-94.4)	14-34	
									83.7(72-90.5)	70+	
131	Bajema et al* (December 10,2021) *Updated analysis of reference #94*	USA	Test-negative case control	755 cases and 1,141 controls	Non-VOC, Alpha, Delta††	Excluded	BNT162b2	Hospitalization	86 (77.6-91.3)	14-119	~36 weeks
									75.1 (64.6-82.4)	120+	
							mRNA-1273		89.6 (80.1-94.5)	14-119	
									86.1 (77.7-91.3)	120+	
130#	UKHSA (January 27 2022) *[Update to Jan 14, 2022 briefing]* *[March 2, 2022 publication by Andrews et al with VE estimated till January 12, 2022 can be accessed here]*	England	Test-negative case control	760,647 Omicron cases, 236,023 Delta cases, and test negative controls aged 18+	**Omicron specifically^**	Excluded	BNT162b2	Symptomatic Infection	65.8 (64.4-67.2)	2-4 weeks	~32 weeks
									9.4 (7.8-11.1)	25+ weeks	
							AZD1222		49.8 (40.7-57.5)	2-4 weeks	
									-1 (-2.4-0.3)	25+ weeks	
							mRNA-1273		76 (72-79)	2-4 weeks	
									13 (3-22)	25+ weeks	
					Delta specifically^		BNT162b2		90.9 (89.6-92)	2-4 weeks	
									62.7 (61.6-63.7)	25+ weeks	
							AZD1222		82.8 (74.5-88.4)	2-4 weeks	
									43.5 (42.4-44.5)	25+ weeks	
							mRNA-1273		94.5 (90.5-96.9)	2-4 weeks	
									80.4 (67.3-88.2)	25+ weeks	
					Omicron specifically^		BNT162b2	Hospitalization	73.6 (40.7-88.3)	2-4 weeks	
									34.9 (17.7-48.4)	25+ weeks	
							AZD1222		55.8 (34.1-70.3)	20-24 weeks	
									s32.7 (19.7-43.6)	25+ weeks	
					Delta specifically^		BNT162b2		94.1 (81.6-98.1)	2-4 weeks	
									95.3 (93.9-96.5)	25+ weeks	
							AZD1222		92.9 (91.3-94.2)	20-24 weeks	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
									90.6 (89.3-91.8)	25+ weeks	
129	Yassi et al (December 6, 2021)	Canada	Retrospective cohort	21,242 HCWs in Vancouver, BC	Non-VOC, Alpha, Delta††	Unknown	BNT162b2 & mRNA-1273	Documented infection	74.1 (62.5-82.1)	7+	~40.5 weeks
			Test-negative case control						82.8 (74.0-88.6)		
128	Muhsen et al* (October 28, 2021)	Israel	Prospective cohort	9162 HCWs (aged 16-65 y) working in long-term care facilities	Alpha^	Excluded	BNT162b2	Documented infection	89 (83-93)	>14	~11 weeks
127	Wu et al* (December 2, 2021)	USA	Retrospective cohort	29,152 matched pairs of cancer patients in the Veterans Affairs health system	Non-VOC, Alpha††	Excluded	BNT162b2 & mRNA-1273	Documented infection	58 (39-73)	14+	15 weeks
126	Vokó et al* (November 24, 2021)	Hungary	Retrospective cohort	3.7 million Hungarian residents aged 16+	Alpha^	Included	BNT162b2	Documented infection	84.0 (83.3-84.7)	14+	~19 weeks
								Death	90.3 (88.9-91.5)		
							Sinopharm	Documented infection	72.8 (71.2-74.4)		~10.5 weeks
								Death	86.0 (83.7-87.9)		
							Sputnik V	Documented infection	88.1 (86.5-84.9)		~11 weeks
								Death	97.8 (95.5-98.9)		
							AZD1222	Documented infection	73.7 (71.1-76.0)		~11.5 weeks
								Death	85.8 (73.5-92.4)		
							mRNA-1273	Documented infection	88.2 (85.8-90.3)		~15 weeks
								Death	93.8 (90.3-96.1)		
125	Hall et al* (February 16, 2022) *[Update to December 1, 2021 preprint]*	United Kingdom	Prospective cohort	35,768 HCWs (18+ years) undergoing routine asymptomatic testing	Non-VOC, Alpha, Delta^	Excluded	BNT162b2	Documented infection	Dose interval <6 weeks: 89 (78-94)	14-73	~8 weeks
									Dose interval <6 weeks: 53 (28-69)	194-265	~36 weeks
									Dose interval 6+ weeks: 85 (72-92)	14-73	~8 weeks
									Dose interval 6+ weeks: 51 (22-69)	194-239	~32 weeks
							AZD1222	Documented infection	58 (23-77)	14-73	~8 weeks
									72 (39-87)	134-220	~29 weeks
124	Thiruvengadam et al (November 25,2021)	India	Test-negative case control	2766 cases and 2377 controls	Delta^	Excluded	AZD1222	Documented infection	63.1 (51.5-72.1)	14+	~10 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
123	Desai et al (November 23,2021)*	India	Test-negative case control	1068 matched case-control HCW pairs	Delta^	Included	BBV152	Symptomatic disease	50 (33-62)	14+	~4 weeks
									46 (22-62)	28+	
									57 (21-76)	42+	
						Excluded			47 (29-61)	14+	
122	Paixao et al* (April 5, 2022) *[Update to November 12 preprint]*	Brazil	Test-negative case control	Pregnant women aged 18-49	Gamma and Delta††	Included	CoronaVac	Symptomatic disease	41.0 (27.0-52.2)	14+	~25 weeks
								Severe disease	85.4 (59.4-94.8)		
121	Ng et al* (November 1, 2021)	Singapore	Retrospective cohort	1204 household contacts of 301 index cases	Delta index cases, specifically	Unknown	BNT162b2 & mRNA-1273	Documented infection	61.6 (37.5-80.4)	15+	~16.5 weeks
								Symptomatic infection	67.9 (41.3-87.8)		
								Severe disease	100 (CI omitted, no events among vaccinated)		
120	Al Hosani et al*(March 18,2022) *[Published version of October 27,2021 preprint]*	United Arab Emirates	Retrospective cohort	176,640 individuals aged 15+	Non-VOC and Alpha^	Included	BBIBP-CorV	Hospitalization	79.8(78-81.4)	14+	~34 weeks
								ICU admissions	92.2(89.7-94.1)		
								Deaths	97.1(83-99.9)		
119	Poukka et al* (January 31, 2022) *[Published version of November 8, 2021]*	Finland	Retrospective cohort	427,905 HCWs aged 16-69 years	Non-VOC, Alpha, Delta^	Excluded	BNT162b2	Documented infection	83 (80-85)	14-90	~11 weeks
									55 (45-64)	181+	~29.5 weeks
								Hospitalization	99 (97-100)	14-90	~11 weeks
									98 (89-100)	181+	~38 weeks
							mRNA-1273	Documented infection	84 (68-92)	14-90	~11 weeks
									69 (-124-96)	91-180	~24 weeks
								Hospitalization	100 (CI omitted)	14-90	~11 weeks
									100 (CI omitted)	181+	~34 weeks
							Heterologous mRNA	Documented infection	100 (CI omitted)	14-90	~11 weeks
									100 (CI omitted)	181+	~29.5 weeks
								Hospitalization	100 (CI omitted)	14-90	~11 weeks
									100 (CI omitted)	181+	~38 weeks
							AZD1222	Documented infection	89 (73-95)	14-90	~11 weeks
									63 (-166-95)	91-180	~24 weeks
								Hospitalization	100 (CI omitted)	14-90	~11 weeks
									100 (CI omitted)	181+	~25 weeks
							Heterologous AZD1222 + mRNA	Documented infection	80 (72-86)	14-90	~11 weeks
									62 (30-79)	91-180	~24 weeks
								Hospitalization	100 (CI omitted)	14-90	~11 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
									100 (CI omitted)	181+	~25 weeks
					Non-VOC, Alpha^		BNT162b2 & mRNA-1273 (homologous or heterologous)	Documented infection	77 (71-82)	14-90	~11 weeks
									55 (34-69)	91-180	~24 weeks
								Hospitalization	95 (64-99)	14-90	~11 weeks
									100 (CI omitted)	91-180	~24 weeks
							AZD1222	Documented infection	100 (CI omitted)	14-90	~11 weeks
									100 (CI omitted)	91-180	~24 weeks
								Hospitalization	100 (CI omitted)	14-90	~11 weeks
							Heterologous AZD1222 + mRNA	Documented infection	100 (CI omitted)	14-90	~11 weeks
									100 (CI omitted)	91-180	~24 weeks
								Hospitalization	100 (CI omitted)	14-90	~11 weeks
					Delta^		BNT162b2 & mRNA-1273 (homologous or heterologous)	Documented infection	85 (81-88)	14-90	~11 weeks
									56 (46-65)	181+	~29.5 weeks
								Hospitalization	100 (97-100)	14-90	~11 weeks
									98 (88-100)	181+	~38 weeks
							AZD1222	Documented infection	88 (71-95)	14-90	~11 weeks
									62 (-177-95)	91-180	~24 weeks
								Hospitalization	100 (CI omitted)	14-90	~11 weeks
									100 (CI omitted))	181+	~25 weeks
							Heterologous AZD1222 + mRNA	Documented infection	80 (72-86)	14-90	~11 weeks
									63 (33-80)	91-180	~24 weeks
								Hospitalization	100 (CI omitted)	14-90	~11 weeks
									100 (CI omitted)	181+	~25 weeks
118	Embi et al* (December 30, 2021) *[Updated version of Embi et al November 5, 2021]*	USA	Test-negative case control	20,101 immunocompromised and 69,116 immunocompetent adults (18+) in nine states	Non-VOC, †† Alpha, †† Delta^	Included	BNT162b2	Hospitalization: immunocompromised	71 (65-76)	14+	~33 weeks
								Hospitalization: immunocompetent	88 (86-89)		
							mRNA-1273	Hospitalization: immunocompromised	81 (76-85)		
								Hospitalization: immunocompetent	93 (92-94)		
					Non-VOC, Alpha††		BNT162b2 & mRNA-1273	Hospitalization: immunocompromised	76 (69-81)		
								Hospitalization: immunocompetent	91 (90-93)		
					Delta^			Hospitalization: immunocompromised	79 (74-83)		
								Hospitalization: immunocompetent	90 (89-91)		
117		Scotland				Unknown	BNT162b2	Death in 40-59 years	95 (79-99)	14+	~25 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	Sheikh et al* (October 20,2021)		Retrospective cohort	1,563,818 adults	Alpha and Delta^			Death in ≥ 60 years	87 (77-93)		
							AZD1222	Death in 40-59 years	88 (76-93)		
								Death in ≥ 60 years	90 (84-94)		
					Delta specifically^		BNT162b2	Death	90 (83-94)		
							AZD1222		91 (86-94)		
116	Reis et al* (October 20,2021)	Israel	Retrospective cohort	94,354 vaccinated adolescents aged 12-18 matched with 94,354 controls	Delta^	Excluded	BNT162b2	Documented infection	90 (88-92)	7-21	~12 weeks
								Symptomatic disease	93 (88-97)		
115	Nordström et al* (October 18, 2021)	Sweden	Retrospective cohort	541,071 vaccinated individuals and 180,716 unvaccinated matched individuals	Delta^	Excluded	BNT162b2	Symptomatic disease	78 (78-79)	14+	~11 weeks
							mRNA-1273		87 (84-88)		
							AZD1222		50 (41-58)		
							AZD1222/ BNT162b2		67 (59-73)		
							AZD1222/ mRNA-1273		79 (62-88)		
114#	Skowronski et al* (April 19, 2022) *[Update to Oct 26,2021 preprint]*	Canada	Test-negative case control	707,566 specimens in British Columbia including 44,964 cases (estimates also available for Quebec, but not included here)	Non-VOC, Alpha, Delta, Gamma^	Excluded	BNT162b2	Documented infection	89 (89-89)	14+	~38 weeks
									93 (92-94)	14-27	
									80 (75-83)	252-279	
								Hospitalization	97 (97-98)	14+	
									98 (96-99)	14-27	
									96 (86-99)	252-279	
							mRNA-1273	Documented infection	90 (89-90)	14+	
									95 (94-96)	14-27	
									55 (40-66)	252-279	
								Hospitalization	97 (97-98)	14+	
									99 (95-100)	14-27	
									95 (65-99)	252-279	
							AZD1222	Documented infection	74 (72-76)	14+	
									77 (57-87)	14-27	
									67 (48-80)	168-195	
								Hospitalization	95 (94-97)	14+	
									97 (71-97)	28-55	
									91 (35-99)	168-195	
							Heterologous mRNA	Documented infection	90 (89-90)	14+	
									95 (91-97)	14-27	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
									96 (73-99)	168-195	
								Hospitalization	98 (97-98)	14+	
									96 (75-100)	14-27	
									96 (92-98)	140-167	
							Heterologous AZD1222 + mRNA	Documented infection	89 (88-89)	14+	
									94 (89-97)	14-27	
									82 (78-85)	140-167	
								Hospitalization	99 (99-100)	14+	
									93 (48-99)	14-27	
									98 (91-99)	140-167	
					Delta specifically^		BNT162b2	Documented infection	89 (89-89)	14+	
									93 (93-94)	14-27	
									79 (75-83)	252-279	
								Hospitalization	98 (97-98)	14+	
									98 (95-99)	14-27	
									94 (87-97)	196-223	
							mRNA-1273	Documented infection	90 (89-90)	14+	
									95 (94-96)	14-27	
									55 (41-66)	196-223	
								Hospitalization	97 (97-98)	14+	
									98 (94-100)	14-27	
									95 (80-99)	196-223	
							AZD1222	Documented infection	73 (72-75)	14+	
									70 (39-86)	14-27	
									67 (48-80)	168-195	
								Hospitalization	95 (93-97)	14+	
									89 (67-97)	28-55	
									91 (34-99)	168-195	
							Heterologous mRNA	Documented infection	90 (89-90)	14+	
									94 (90-97)	14-27	
									96 (73-99)	168-195	
								Hospitalization	98 (97-98)	14+	
									97 (93-99)	28-55	
									96 (92-98)	140-167	
							Heterologous AZD1222 + mRNA	Documented infection	88 (88-89)	14+	
									94 (88-97)	14-27	
									82 (77-85)	140-167	
								Hospitalization	99 (99-100)	14+	
									91 (33-99)	14-27	
									98 (91-99)	140-167	
							BNT162b2	Documented infection	96 (92-98)	14+	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
					Alpha specifically^			Hospitalization	96 (83-99)		
							mRNA-1273	Documented infection	95 (84-98)		
							AZD1222	Documented infection	75 (33-91)		
							Heterologous mRNA	Documented infection	96 (73-99)		
					Gamma specifically^		BNT162b2	Documented infection	92 (88-95)		
								Hospitalization	95 (82-98)		
							mRNA-1273	Documented infection	95 (85, 98)		
							AZD1222	Documented infection	91 (63-98)		
							Heterologous mRNA	Documented infection	94 (76-99)		
							Heterologous AZD1222 + mRNA	Documented infection	96 (69-99)		
113	Lin et al* (March 10, 2022) *[Update to October 26,2021 preprint]*	USA	Retrospective cohort	10,600,823 cases registered in North Carolina	Alpha and Delta^	Unknown	BNT162b2	Symptomatic disease	94.5 (94.1-94.9)	1.25 months	~27 weeks
									67.8 (65.9-69.7)	7.25 months	
								Hospitalization	96.4 (95.1-97.4)	1.25 months	
									92.4 (89.7-94.4)	7.25 months	
								Death	98 (95.5-99.1)	1.25 months	
									95.5 (92.2-97.4)	7.25 months	~32 weeks
							mRNA-1273	Symptomatic disease	95.9 (95.5-96.2)	1 month	
									77.8 (75.9-79.6)	7 months	
								Hospitalization	97.2 (96.1-98)	1 months	
									94.9 (92.4-96.6)	7 months	
								Death	98.6 (97.3-99.3)	1 months	
									96.0 (92.8-97.8)	7 months	~22 weeks
							Ad26.COV2.S	Symptomatic disease	71.4 (68.3-74.2)	2 mo	
									64.0 (60.3-67.4)	6 mo	
								Hospitalization	85.8 (74.9-91.9)	2 mo	
									81.7 (68.6-89.3)	6 mo	
								Death	82.2 (46.3-94.1	2 mo	
									71.2 (40.8-86)	6 mo	
112	Nordstrom et al* (February 4,2022)	Sweden	Retrospective cohort	842,974 pairs of vaccinated and unvaccinated Swedish individuals	Delta^	Excluded	BNT162b2	Symptomatic disease	92 (92-93)	15-30	~30 weeks
									23 (-2 – 41)	210+	
							mRNA-1273		96 (94-97)	15-30	
									59 (18-79)	180+	
							AZD1222		68 (52-79)	15-30	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	[Published version of October 25 preprint]								-19 (-97 – 28)	120+	
							AZD1222 and any mRNA vaccine		89 (79-94)	15-30	
									66 (41-80)	120+	
111	Ranzani et al* (February 9, 2022) *[Update to (October 20,2021 preprint]*	Brazil	Test-negative case control	10,077 individuals residing in a favela in Rio De Janeiro	Gamma and Delta^	Excluded	AZD1222	Documented infection	59 (33.1-74.8)	14+	~31 weeks
								Symptomatic disease	65.1 (40.9-79.4)		
110	Chin et al* (October 20, 2021)	USA	Retrospective cohort	827 propensity matched incarcerated men	Delta^	Included	mRNA-1273	Documented infection	56.6 (42.0-67.5)	14+	~27 weeks
								Symptomatic disease	84.2 (56.4-94.3)		
						Previously infected only		Documented infection	80.5 (52.8-92.0)		
						Excluded		Documented infection	49.5 (31.5-62.7)		
109	Irizarry et al (November 17, 2021) *[Updated version of Robles-Fontan et al (October 20,2021)]*	Puerto Rico	Retrospective cohort	87,704 PCR confirmed infections for individuals 12 years or older	Non-VOC, Alpha, Beta and Delta^^	Unknown	BNT162b2	Hospitalization (45-74y)	92 (90.8-93)	14+	~20 weeks
								Hospitalization (75-84y)	93.3 (91.3-95)		
								Hospitalization (85+y)	97.1 (95.8-98)		
								Death (45-74y)	86 (81-89)		
								Death (75-84y)	87 (80-92)		
								Death (85+y)	95.2 (91.5-97)		
							mRNA-1273	Hospitalization (45-74y)	82 (78-85)		
								Hospitalization (75-84y)	91.5 (89-94)		
								Hospitalization (85+y)	97.2 (96-98)		
								Death (45-74y)	69 (52-79)		
								Death (75-84y)	87 (79-92)		
								Death (85+y)	96.2 (93.9-98)		
							Ad26.COV2.S	Hospitalization (45-74y)	96.1 (95-97)		
								Hospitalization (75-84y)	98 (96.7-99)		
								Hospitalization (85+y)	99.2 (98.6-99.5)		
								Death (45-74y)	93.8 (90-96)		
								Death (75-84y)	96.6 (91.7-98)		
								Death (85+y)	99.3 (98.6-99.6)		
							BNT162b2	Documented infection[xx]	87 (85-89)	14+	
									57 (53-60)	144+	
								Hospitalisation	92 (85-95)	14+	
									80 (73-85)	144+	
								Death	97 (86-100)	14+	
									86 (75-92)	144+	
							mRNA-1273	Documented infection[xx]	90 (88-91)	14+	~18 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
									73 (70-76)	144+	
								Hospitalisation	95 (89-97)	14+	
									90 (84-94)	144+	
								Death	99 (89-100)	14+	
									93 (81-97)	144+	
							Ad26.COV2.S	Documented infection[XX]	62 (54-68)	14+	~22 weeks
									36 (30-42)	144+	
								Hospitalisation	81 (60-91)	14+	
									67 (53-76)	144+	
								Death	78 (16-94)	14+	
									72 (49-85)	144+	
							BNT162b2	Documented infection[XX]	56 (53-59)	at day 137	~20 weeks
							mRNA-1273		71 (68-74)	at day 139	~18 weeks
							Ad26.COV2.S		27 (17-37)	at day 158	~22 weeks
108	Olson et al* (October 19, 2021)	USA	Test-negative case control	179 case patients and 285 controls aged 12-18 years	Delta^	Unknown	BNT162b2	Hospitalization (12-15y)	91 (74-97)	14+	~12 weeks
								Hospitalization (16-18y)	94 (78-99)		
107	Arregoces et al (October 19, 2021)	Colombia	Matched-pair cohort study	3,346,826 adults aged 60+ in Colombia	Mu^	Excluded	BNT162b2	Hospitalization	90.3 (87.1-92.7)	14+	~9 weeks
								Post-hospitalization death	98.5 (97.8-98.9)		
								Death without prior hospitalization	89.2 (85.6-91.9)		
							CoronaVac	Hospitalization	67.2 (63.7-70.4)		~11 weeks
								Post-hospitalization death	77.1 (75.5-78.6)		
								Death without prior hospitalization	69.8 (66.7-72.6)		
							AZD1222	Hospitalization	75.4 (48.2-88.3)		~7 weeks
								Post-hospitalization death	96.3 (88.4-98.8)		
								Death without prior hospitalization	88.7 (64.8-96.4)		
							Ad26.COV2.S	Hospitalization	80(19.9-95.0)		~4 weeks
								Death without prior hospitalization	75(0.0-93.8)		
106	Ranzani et al (October 18, 2021)	Brazil	Test-negative case control	11,817 adults In Mato-Grosso do Sul	Gamma^	Excluded	Ad26.COV2.S	Symptomatic disease	50.9 (35.5-63.0)	28+	~10 weeks
								Hospitalization	72.9 (35.1-91.1)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								ICU Admission	92.5 (54.9-99.6)		
								Death	90.5 (31.5-99.6)		
105	Liu et al* (May 24, 2022) *[Published version of October 7, 2021 preprint]*	USA	Test-negative case control	10,283 matched adult residents (18+) of New York City	Alpha, Delta^	Excluded	BNT162b2 & mRNA-1273	Overall: Documented infection	59 (52-65)	14+	~35 weeks
								Immunocompromised: Documented infection	57 (45-66)		
104	Bruxvoort et al* (December 15,2021) *[Update to October 1, 2021 preprint]*	USA	Test-negative case control	8,153 cases and matched controls among Kaiser Permanente patients (aged 18+) in Southern California	Delta specifically^	Excluded	mRNA-1273	Documented infection	86.7 (84.3-88.7)	14+	~25 weeks
									94.1 (90.5-96.3)	14-60	~6.5 weeks
									80.0 (70.2-86.6)	151-180	~23.5 weeks
								Hospitalization	97.5 (92.7-99.2)	14+	~25 weeks
					Non-Delta specifically^			Documented infection	98.6 (97.3-99.3)	14-60	~6.5 weeks
									88.7 (73.2-95.2)	121-150	~19.5 weeks
					Alpha specifically^			Documented infection	98.4 (96.9-99.1)	14+	~25 weeks
					Gamma specifically^			Documented infection	95.5 (90.9-97.8)	14+	
103	Martinez-Baz et al (September 30,2021)	Spain	Prospective cohort	30,240 close contacts of 12,263 index cases	Non-VOC, Alpha and Delta^	Excluded	BNT162b2	Documented infection	69 (66-72)	14+	~31 weeks
									70 (67-73)	<90	~11 weeks
									63 (58-68)	≥ 90	~18 weeks
								Symptomatic disease	72 (69-75)	14+	~31 weeks
								Hospitalization	93 (88-96)		
							mRNA-1273	Documented infection	82 (78-86)	14+	~28 weeks
									67 (50-78)	≥ 90	~15 weeks
								Symptomatic disease	85 (80-89)	14+	~28 weeks
								Hospitalization	98 (82-100)		
							AZD1222	Documented infection	54 (48-60)	14+	~16 weeks
									54 (47-60)	<90	~11 weeks
								Symptomatic disease	56 (48-63)	14+	16 weeks
								Hospitalization	95 (79-99)		
							Ad26.COV2.S	Documented infection	50 (42-57)	14+	~23 weeks
									52 (44-59)	<90	~11 weeks
									28 (-8–53)	≥ 90	~10 weeks
								Symptomatic disease	54 (45-62)	14+	~23 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								Hospitalization	74 (43-88)		
							1 dose of AZD1222+ 1 dose of BNT162b2	Documented infection	86 (70-93)	14+	~21 weeks
									85 (69-93)	<90	~11 weeks
								Symptomatic disease	91 (71-97)	14+	~21 weeks
								Hospitalization	95 (79-99)		
					Alpha^ specifically		BNT162b2	Documented infection	71 (61-78)	14+	~31 weeks
							mRNA-1273		86 (56-95)		~28 weeks
							AZD1222		38 (-42–73)		16 weeks
							Ad26.COV2.S		77 (27-93)		~23 weeks
					Delta^ specifically		BNT162b2	Documented infection	67 (59-74)	14+	~31 weeks
							mRNA-1273		77 (64-85)		~28 weeks
							AZD1222		55 (39-67)		16 weeks
							Ad26.COV2.S		42 (18-59)		~23 weeks
							1 dose of AZD1222+ 1 dose of BNT162b2		86 (45-97)		~21 weeks
102#	Eyre et al* (January 5, 2022) *[Update to Sept 29, 2021 preprint]*	England	Retrospective cohort	146,243 household contacts of 108,498 index cases	Alpha^ specifically	Included	BNT162b2	Documented infection	85 (79-89)	14+	~20.5 weeks
							AZD1222		60 (41-73)		~8 weeks
					Delta^ specifically	Included	BNT162b2	Documented infection	81 (77-84)		~29 weeks
							AZD1222		58 (55-62)		~16 weeks
101	Glatman-Freedman et al (September 27, 2021)	Israel	Retrospective cohort	Adolescents aged 12-15 y	Delta^	Excluded	BNT162b2	Documented infection	91.5 (88.2-93.9)	8-28	2 weeks
100	Meyer et al* (September 9, 2022) *[Update to September 23,2021 preprint]*	Germany	Retrospective cohort	252 residents and staff of a nursing home Non-household close contacts	Alpha^	Unknown	BNT162b2	Documented infection	56 (15-77)	7+	~11 weeks
99	Pilishvili et al* (September 22, 2021)	USA	Test-negative case control	1482 HCPs as cases and 3449 HCPs as control	Alpha††	Excluded	BNT162b2 & mRNA-1273	Symptomatic disease	88.9 (84.7-92.0)	14+	~14 weeks
									96.3 (92.5-98.2)	15-28	
									80.7 (61.0-90.4)	85-98	
							BNT162b2	Symptomatic disease	88.8 (84.6-91.8)	7+	
							mRNA-1273		96.3 (91.3-98.4)		
97	Self et al* (September 17, 2021)	USA	Test-negative case control	1,682 case-patients and		Excluded	BNT162b2	Hospitalization	88 (85-91)	14+	~20 weeks
									91 (88–93)	14-120	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				2,007 control-patients ≥18 years without immunocompromising conditions	Alpha and Delta††				77 (67–84)	>120	
							mRNA-1273		93 (91-95)	14+	
									93 (90–95)	14-120	
									92 (87–96)	>120	
							Ad26.COV2.S		71 (56–81)	14+	
									68 (49–80)	>28	
96	Glatman-Freedman et al* (September 16, 2021)	Israel	Retrospective longitudinal cohort	All Israeli residents aged 16+	Alpha^	Excluded	BNT162b2	Documented infection	97.3 (96.7-97.8)	22-28	2 weeks
								Symptomatic disease	97.9 (97.4-98.3)		
								Hospitalization	99.0 (98.4-99.3)		
								Severe/critical disease	99.2 (98.6-99.5)		
								Death	98.6 (97.0-99.3)		
95#	Andrews et al* (January 12,2022) *[Update to September 14, 2021 preprint]*	England	Test-negative case control	1,706,743 symptomatic cases and 3,763,690 test-negative control patients among adults (16+)	Alpha specifically^	Excluded	BNT162b2	Symptomatic disease	94.9 (93.6-95.9)	14-63	~33.5 weeks
									94.8 (88.4-97.7)	70+	~33.5 weeks
								Hospitalization	97.7 (90.8-99.4)	14-63	~33.5 weeks
								Death	96.6 (94.4.-96.5)	14+	~33.5 weeks
							AZD1222	Symptomatic disease	82.1 (79.4-84.5)	14+	~20.5 weeks
									82.4 (79.6-84.7)	14-63	~8 weeks
									76.2 (49.8-88.7)	70+	~20.5 weeks
								Hospitalization	95.1 (86.7-98.2)	14-63	~20.5 weeks
									100 (CI omitted, no deaths among vaccinated)	70+	~20.5 weeks
								Death	100 (CI omitted, no deaths among vaccinated)	14+	~20.5 weeks
					Delta specifically^		BNT162b2	Symptomatic disease	83.3 (83.1-83.5)	14+	~33.5 weeks
									89.8 (89.6-90)	14-63	~8 weeks
									69.7 (68.7-70.5)	140+	~33.5 weeks
								Hospitalization	96.6 (96.2-96.9)	14+	~33.5 weeks
									98.4 (97.9-98.8)	14-63	~8 weeks
									92.7 (90.3-94.6)	140+	~33.5 weeks
								Death	95.6 (94.4-96.6)	14+	~33.5 weeks
									98.2 (95.9-99.2)	14-63	~8 weeks
									90.4 (85.1-93.8)	140+	~33.5 weeks
							AZD1222	Symptomatic disease	64.2 (63.9-64.5)	14+	~20.5 weeks
									66.7 (66.3-67)	14-63	~8 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
									47.3 (45-49.6)	140+	~20.5 weeks
								Hospitalization	92.5 (92-93)	14+	~20.5 weeks
									95.2 (94.6-95.6)	14-63	~8 weeks
									77 (70.3-82.3)	140+	~20.5 weeks
								Death	93.2(91.7-94.5)	14+	~20.5 weeks
									94.1 (91.8-95.8)	14-63	~8 weeks
									78.7 (52.7-90.4)	140+	~20.5 weeks
							mRNA-1273	Symptomatic disease	94.8 (94.4-95.2)	14+	~7 weeks
									93.8(93.4-94.1)	14-63	
									85.6(83.8-87.2)	70-104	
								Hospitalization	100 (CI omitted, no events among vaccinated)	14-63	~7 weeks
94	Bajema et al (September 10,2021)	USA	Test-negative case control	388 case-patients and 787 controls from 5 Veterans Affair Medicals Centers	Alpha, Delta, Non-VOC††	Excluded	BNT162b2 & mRNA-1273	Hospitalization	86.1 (76.5-91.8)	<104 days	~13 weeks
								Hospitalization	87.2 (78.2-92.5)	≥104 days	~28.5 weeks
							BNT162b2	Hospitalization	83.4 (74.0-89.4)	14+	~28.5 weeks
							mRNA-1273	Hospitalization	91.6 (83.5-95.7)		~26.5 weeks
					Alpha^		BNT162b2 & mRNA-1273	February-June: Hospitalization	84.1 (74.1-90.2)		~23 weeks
					Delta^			July-August: Hospitalization	89.3 (80.1-94.3)		~28.5 weeks
93	Polinski et al* (March 17,2022) *[Published version of previous September 10,2021 preprint]*	USA	Retrospective Cohort	2,076,065 individuals ≥18 years	Alpha††	Excluded	Ad26.COV2.S	Documented infection	76(75-77)	14+	~14 weeks
								Hospitalization	81(78-82)		
								Immunocompromised: Documented infection	64 (59-68)		
								Immunocompromised: Hospitalization	67 (57-74)		
					Delta^			June-August: Documented infection	74(71-77)		
								June-August: Hospitalization	81(75-86)		
92	Grannis et al (September 10,2021)	USA	Test-negative	32,867 events from 187 hospitals and 221 emergency departments/urgent care visits	Delta^	Included	BNT162b2	Hospitalization	80 (73-85)	14+	4 weeks
								Emergency/Urgent care visit	77 (74–80)		
							mRNA-1273	Hospitalization	95 (92-97)		
								Emergency/Urgent care visit	92 (89-93)		
							Ad26.COV2.S	Hospitalization	60 (31-77)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								Emergency/Urgent care visit	65 (56-72)		
91	Dagan et al* (September 7,2021)	Israel	Prospective Cohort	10,861 vaccinated pregnant females matched with 10,861 controls	Alpha^	Excluded	BNT162b2 & mRNA-1273	Documented infection	96 (89-100)	7-56	~11 weeks
								Symptomatic infection	97 (91-100)		
								Hospitalization	89 (43-100)		
90	Thompson et al* (September 8, 2021)	USA	Test-negative case control	58,904 adults aged 50+ with Covid-like illness who were hospitalized or visited emergency/ urgent care facilities	Non-VOC, Alpha^††	Excluded	BNT162b2	Hospitalization	87 (85-90)	14+	~22 weeks
								Emergency department or urgent care visit	89 (85-91)		
							mRNA-1273	Hospitalization	91 (89-93)		20 weeks
								Emergency department or urgent care visit	92 (89-94)		
							Ad26.COV2.S	Hospitalization	68 (50-79)		14 weeks
								Emergency department or urgent care visit	73 (59-82)		
							BNT162b2 & mRNA-1273	Hospitalization, patients with ≥ 1 chronic respiratory condition	90 (88-92)	14+	~22 weeks
								Hospitalization, patients with ≥ 1 chronic non-respiratory condition	88 (86-90)		
								Hospitalization, overall	88 (84-92)	14-27	~2 weeks
									86 (74-93)	112+	~22 weeks
								Emergency department or urgent care visit	92 (88-95)	14-27	~2 weeks
									86 (74-93)	112+	~22 weeks
89	Iliaki et al* (October 18, 2021) *[Update to September 6 preprint]*	USA	Retrospective Cohort	4,317 HCWs	Alpha††	Excluded	BNT162b2 & mRNA-1273	Documented infection	95.2(80.0-98.8)	14+	~10 weeks
88	Tande et al* (September 6,2021)	USA – Mayo Clinic, Minnesota	Retrospective Cohort	Asymptomatic screening of 46,008 patients: pre-surgical, pre-op PCR tests	Non-VOC^††	Included	BNT162b2 & mRNA-1273	Asymptomatic infection (January-March)	91 (72-98)	14+	~10 weeks
					Alpha^††			Asymptomatic infection (April-May)	71 (53-83)		~19 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
					Delta^††			Asymptomatic infection (June-August)	63 (44-76)		~32 weeks
87	Barlow et al (September 3,2021)	USA	Test-negative case control	500 matched pairs aged 15 years and above	Delta^	Excluded	BNT162b2 and mRNA-1273	Documented infection	74(65-82)	14+	~4 weeks
							Ad26.COV2.S		51(-2 – 76)		
86	Bruxvoort et al* (November 24, 2021) *[Update to September 2,2021 Preprint]*	USA	Matched prospective cohort	352,878 vaccinated 352,878 unvaccinated individuals	Delta and Alpha^	Included	mRNA-1273	Documented infection	87.4 (85.6-89.1)	14+	~20 weeks
								Asymptomatic infection	72.7 (57.6-82.4)		
								Symptomatic infection	88.3 (86.5-89.9)		
								Hospitalization	95.8 (92.5-97.6)		
								Death	97.9 (84.5-99.7)		
85	Giansante et al* (September 2, 2021)	Italy	Retrospective cohort	9839 staff and HCWs	Delta and Alpha^	Excluded	BNT162b2 and mRNA-1273	Documented infection	84.8 (73.2-91.4)	14+	~16 weeks
								Symptomatic infection	87.1 (69.3-94.6)		
				Only 7190 HCWs				Documented infection	84.4 (69.7-92.0)		
								Symptomatic infection	86.5 (62.9-95.1)		
84	Katz et al* (December 10,2021) *[Published version of September 2 pre-print]*	Israel	Prospective cohort	1,250 HCWs from six Israeli hospitals	Alpha^	Included	BNT162b2	Documented infection	94.5(82.5-98.2)	14+	~18 weeks
								Symptomatic infection	97 (72-99.7)	7+	
83	Nunes et al* (September 23, 2021)	Portugal	Retrospective cohort	1,880,351 older adults (65+) in Portugal	Alpha^ (Feb-Mar) then Delta^ (May-onward)	Excluded	BNT162b2 and mRNA-1273	Hospitalization, 65-79 y	94 (88-97)	14+	~14.5 weeks
								Death, 65-79 y	96 (92-98)		
								Hospitalization, 80+ y	82 (72-89)	14+	~22.5 weeks
								Death, 80+ y	81 (74-87)	14+	
82#	Chemaitelly et al* (October 6, 2021) *[Update to Aug 27 preprint]* *Note: See Duration of Protection Table for further context*	Qatar	Test-negative case control	142,300 cases and 848,240 controls among residents of Qatar (12+)	Alpha^ then Beta^ (Jan-Jun), then Delta^ (Jul-Sep)	Included	BNT162b2	Documented infection	73.2 (71.3-75.0)	28-63	7 weeks
									22.3 (-1.7-40.7)	175+	~32 weeks
								Symptomatic infection	72.5 (69.6-75.1)	28-63	7 weeks
									27.8 (-1.4-48.7)	175+	~32 weeks
								Asymptomatic infection	66.9 (61.9-71.3)	28-63	7 weeks
									-33.3 (-181.8-36.9)	175+	~32 weeks
								Severe, critical, or fatal disease	96.8 (93.9-98.3)	28-63	7 weeks
									55.6 (-44.3-86.3)	175+	~32 weeks
							BNT162b2	Documented infection	88.6 (79.2-93.7)	28-63	7 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
					Alpha specifically^				80.0 (-71.2-97.7)	147+	~32 weeks
					Beta specifically^		BNT162b2	Documented infection	63.9 (52.6-72.5)	28-63	7 weeks
									40.0 (-151.1-85.7)	147+	~32 weeks
					Delta specifically^		BNT162b2	Documented infection	73.3 (63.6-80.4)	28-63	7 weeks
									17.9 (-12.9-40.3)	147+	~32 weeks
81	Goldberg et al (October 27, 2021) *[Update to Aug 25 preprint]* *Note: See Duration of Protection Table for further context*	Israel	Retrospective cohort	9,395,923 adults (16+) in Israel	Delta^	Excluded	BNT162b2	Documented infection, 16-39 y fully vaccinated May 2021 (~2 mos prior)	80 (75-84)	55-98	13 weeks
								Documented infection, 16-39 y fully vaccinated Jan 2021 (~6 mos prior)	55 (50-60)	168-203	28 weeks
								Documented infection, 40-59 y fully vaccinated May 2021 (~2 mos prior)	83 (75-88)	55-98	13 weeks
								Documented infection, 40-59 y fully vaccinated Jan 2021 (~6 mos prior)	57 (53-61)	168-203	28 weeks
								Documented infection, 60+ y fully vaccinated May 2021 (~2 mos prior)	82 (70-89)	55-98	13 weeks
								Documented infection, 60+ y fully vaccinated Jan 2021 (~6 mos prior)	57 (52-62)	168-203	28 weeks
								Severe disease, 40-59 y fully vaccinated Mar 2021 (~4 mos prior)	98(94-99)	109-159	22 weeks
								Severe disease, 40-59 y fully vaccinated Jan 2021 (~6 mos prior)	93 (86-97)	168-203	28 weeks
								Severe disease, 60+ y fully vaccinated Mar 2021 (~4 mos prior)	92 (87-95)	109-159	22 weeks
								Severe disease, 60+ y fully vaccinated Jan 2021 (~6 mos prior)	85(81-88)	168-203	28 weeks
	Tartof et al*	USA				Included	BNT162b2	Documented infection	73 (72-74)	7+	~29 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
80#	(October 16, 2021) *[Update to Aug 23 preprint]*		Retrospective cohort	3,436,957 members (12+) of Kaiser Permanente Southern California healthcare system	Epsilon (Jan-Mar), Alpha (Apr-May), Delta (Jun-Jul)^				88 (86-89)	7-36	~3 weeks
									47 (43-51)	157+	~29 weeks
								Hospitalization	90 (89-92)	7+	~29 weeks
									87 (82-91)	7-36	~3 weeks
									88 (82-92)	157+	~29 weeks
					Delta specifically^			Documented infection	75 (71-78)	7+	~29 weeks
									93 (85-97)	7-36	~3 weeks
									53 (39-65)	127+	~29 weeks
								Hospitalization	93 (84-96)	7+	~29 weeks
					Non-Delta variants specifically^			Documented infection	91 (88-92)	7+	~29 weeks
									97 (95-99)	7-36	~3 weeks
									67 (45-80)	127+	~29 weeks
								Hospitalization	95 (90-98)		~29 weeks
79	Prasad et al (August 19,2021)	USA	Retrospective cohort	3,104 surgery patients and 7,438 propensity-matched controls	Non-VOC††	Included	BNT162b2 or mRNA-1273	Post-operative documented infection	91 (56-99)	14+	~8 weeks
78	Pouwels et al* (October 14, 2021) *[Update to Aug 18 preprint]*	UK	Prospective cohort	384,543 individuals aged 18 years or older	Alpha^ (December - May)	Included	BNT162b2	Documented infection	78 (68-84)	14+	~28 weeks
								Ct<30	94 (91-96)		
							AZD1222	Documented infection	79 (56-90)		
								Ct<30	86 (71-93)		
				358,983 individuals	Delta^ (May -August)		BNT162b2	Documented infection	80 (77-83)		
								Ct<30	84 (82-86)		
							AZD1222	Documented infection	67 (62-71)		
								Ct<30	70 (65-73)		
77	Tenforde et al* (November 4, 2021) *[Update to Aug 18 MMWR)*	USA	Test-negative case control	4513 hospitalized adults (18+)	Alpha and Delta^	Included	BNT162b2	Hospitalization, all	81 (77-84)	14+	~30 weeks
									85 (82-88)	14-120	~15 weeks
									64 (51-73)	120+	~30 weeks
							mRNA-1273	Hospitalization, all	89 (86-92)	14+	~28 weeks
									91 (87-93)	14-120	~15 weeks
									85 (77-91)	120+	~28 weeks
							BNT162b2 or mRNA-1273	Hospitalization, Immunocompetent	90 (87-91)	14+	~30 weeks
								Hospitalization, Immunocompromised	51 (31-65)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
					Alpha specifically^		BNT162b2 or mRNA-1273	Hospitalization, all	90 (84-94)		
					Delta specifically^			Hospitalization, all	86 (79-90)		
76	Chin et al* (January 27, 2022) *[Published version of August 18, 2021 preprint]*	USA	Retrospective cohort	60,707 incarcerated people in California prisons	Non-VOC^	Excluded	BNT162b2 or mRNA-1273	Documented infection, all	97 (88-99)	14+	~5 weeks
								Documented infection, cohort at moderate/high risk for severe COVID-19	92 (74-98)		
							mRNA-1273	Documented infection, all	96 (67-99)		
75	Nanduri et al (August 18,2021)	USA	Retrospective cohort	10,428,783 residents of skilled nursing facilities	Non-VOC and Alpha†† (Pre-Delta circulation) ^	Unknown	BNT162b2	Documented infection	74.2 (69–78.7)	14+	~16 weeks
							mRNA-1273		74.7(66.2-81.1)		
					Alpha†† (Delta circulating but not dominant) ^		BNT162b2	Documented infection	66.5 (58.3-73.1)		~22 weeks
							mRNA-1273		70.4 (60.1-78.0)		
					Delta^		BNT162b2	Documented infection	52.4 (48–56.4)		~28 weeks
							mRNA-1273		50.6 (45–55.7)		
74#	Tang et al* (November 2, 2021) *[Update to Aug 11 preprint]*	Qatar	Test-negative case control	Cases with confirmed Delta (~2800 per analysis) or Beta infection and matched controls (~11,200) among residents of Qatar of all ages	Delta specifically^	Included	BNT162b2	Documented infection	50.6 (45.4-55.3)	14+	~25 weeks
							mRNA-1273		72.0 (66.1-76.9)		
							BNT162b2	Severe, critical, or fatal disease	94.1 (85.9-97.6)		
							mRNA-1273		96.1 (71.4-99.5)		
							BNT162b2	Symptomatic COVID-19	44.4 (37.0-50.9)		
							mRNA-1273		73.9 (65.9-79.9)		
							BNT162b2	Asymptomatic COVID-19	46.0 (32.3-56.9)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
							mRNA-1273		53.6 (33.4-67.6)		
					Beta specifically^		BNT162b2	Documented infection	74.3 (70.3-77.7)		
							mRNA-1273		80.8 (69.0-88.2)		
							BNT162b2	Severe, critical, or fatal disease	92.7 (81.5-97.1)		
							mRNA-1273		100.0 (CI omitted due to zero events among vaccinated)		
73	Chemaitelly et al (August 9, 2021)	Qatar	Retrospective cohort	782 kidney transplant recipients	Alpha and Beta^	Excluded	BNT162b2 and mRNA-1273	Documented infection	46.6 (0.0-73.7)	14+	~17 weeks
									66.0 (21.3-85.3)	42+	
									73.9 (33-89.9)	56+	
								Severe infection	72.3 (0.0-90.9)	14+	
									85.0 (35.7-96.5)	42+	
									83.8 (31.3-96.2)	56+	
72	Puranik et al (August 9, 2021)	USA	Retrospective cohort	77,607 adults	Alpha and Delta ^	Excluded	BNT162b2	Documented infection	76 (69-81)	14+	~ 26 weeks
								Hospitalization	85 (73-93)		
								ICU admission	87 (46-98.6)		
							mRNA-1273	Documented infection	86 (81-90.6)		
								Hospitalization	91.6 (81-97)		
								ICU admission	93.3 (57-99.8)		
71	de Gier et al* (August 5, 2021)	Netherlands	Retrospective cohort	184,672 household and other close contacts (aged 18+) of 113,582 index cases (aged 18+)	Alpha^	Unknown	AZD1222	Documented infection among household contacts (adj. for vaccination status of index case)	87 (77-93)	7+	~15 weeks
							BNT162b2		65 (60-70)		
							mRNA-1273		91 (79-97)		
							Ad26.COV2.S		12 (-71-54)	14+	
70	Lefèvre et al (July 31,2021)	France	Retrospective cohort	378 LTCF residents	Beta specifically^	Included	BNT162b2	Documented infection	49 (14-69)	7+	~16 weeks
								Hospitalization and death	86 (67-94)		
69	Alali et al (July 29,2021)	Kuwait	Retrospective cohort	3,246 HCWs	Alpha^	Excluded	BNT162b2	Documented infection	94.5 (89.4-97.2)	7+	~18 weeks
68	Gram et al* (December 17, 2021) *[Published version of July 28 pre-print]*	Denmark	Retrospective cohort	5,542,079 adults	Alpha^	Excluded	Heterologous: AZD1222 (1st dose)	Documented infection	88 (83-92)	14+	~20 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
							BNT162b2 or mRNA-1273(2nd dose)				
67	Amirthalingam et al (December 10,2021) *[Published version of July 28 pre-print]*	UK	Test-negative case control	750 participants aged 50-89 years	Alpha^	Excluded	BNT162b2	Documented infection, 80 y+	77 (56-88)	14+, dose interval 19-29 days	~16 weeks
									90 (83-94)	14+, dose interval 65-84 days	
								Documented infection, 65-79 y	77 (66-85)	14+, dose interval 19-29 days	
									89 (86-92)	14+, dose interval 65-84 days	
								Documented infection, 50-64 y	88 (67-96)	14+, dose interval 19-29 days	
									92 (91-94)	14+, dose interval 65-84 days	
							AZD1222	Documented infection, 80 y+	96(68-99)	14+, dose interval 45-64 days	
									82 (68-89)	14+, dose interval 65-84 days	
								Documented infection, 65-79 y	73 (25-90)	14+, dose interval 30-44 days	
									74 (69-79)	14+, dose interval 65-84 days:	
								Documented infection, 50-64 y	55 (34-69)	14+, dose interval 30-44 days	
									77 (74-79)	14+, dose interval 65-84 days	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
66	Kissling et al (July 22,2021)	UK, France, Ireland, Netherlands, Portugal, Scotland, Spain, Sweden	Test-negative	592 cases and 4,372 controls aged 65+	Alpha^	Excluded	BNT162b2	Symptomatic COVID-19	87(74-93)	14+	~16 weeks
65#	Carazo et al* (August 30, 2021) *[Update to July 22 preprint]*	Canada	Test-negative case control	5316 cases and 53,160 test negative controls among HCWs	Non-VOC and Alpha^	Excluded	BNT162b2	Documented infection	85.5 (80.4-89.3)	7+	~20 weeks
								Symptomatic COVID-19	92.2 (87.8-95.1)		
							mRNA-1273	Documented infection	84.1 (34.9-96.1)	7+	
					Alpha specifically^	Excluded	BNT162b2 and mRNA-1273	Documented infection	92.6 (87.1-95.8)	7+	
					Non-VOC specifically^	Excluded	BNT162b2 and mRNA-1273	Documented infection	86.5 (56.8-95.8)		
64	Hitchings et al (October 28, 2021) *[Update to July 22 preprint]*	Brazil	Test-negative case control	30,680 matched pairs of adults aged 60+ in Sao Paolo, Brazil	Gamma^	Included (except in previous 90 days)	AZD1222	Symptomatic COVID-19	77.9 (69.2-84.2)	14+	~9.5 weeks
								Hospitalization	87.6 (78.2-92.9)		
								Death	93.6 (81.9-97.7)		
63	Kim et al* (September 8, 2021) *[Update to July 22 preprint]*	USA	Test-negative case control	812 US adults aged 16+ with COVID-19-like illness	Non-VOC and Alpha††	Unknown	BNT162b2 and mRNA-1273	Symptomatic COVID-19	91 (83-95)	14+	~18.5 weeks
62#	Lopez Bernal et al* (July 21, 2021)	UK	Test-negative case control	19,109 cases and 171,834 test negative controls aged 16+	Alpha specifically^	Excluded	BNT162b2	Symptomatic COVID-19	93.7 (91.6–95.3)	14+	~17 weeks
							AZD1222	Symptomatic COVID-19	74.5 (68.4–79.4)		
					Delta specifically^		BNT162b2	Symptomatic COVID-19	88.0 (85.3–90.1)		
							AZD1222	Symptomatic COVID-19	67.0 (61.3–71.8)		
61	Butt et al* (July 20, 2021)	USA	Test-negative case control	54,360 propensity-matched pairs of veterans	Original and Alpha ††	Excluded	BNT162b2 and mRNA-1273	Documented infection	97.1 (96.6-97.5)	7+	~6.5 weeks
							BNT162b2	Documented infection	96.2 (95.5-96.9)		
							mRNA-1273	Documented infection	98.2 (97.5-98.6)		
60	Layan et al* (March 03, 2022) *[Published version of*	Israel	Prospective cohort	215 index cases and 687 household	Original and Alpha¶	Included	BNT162b2	Documented infection among HHCs vaccinated and not isolated	79 (56-92)	7+	~12 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	July 16,2021 preprint]			contacts (HHCs) from 210 Israeli households				(relative to HHCs not vaccinated and not isolated)			
59	Balicer et al* (September 7,2021) *[Update to July 12 preprint]*	Israel	Prospective Cohort	21722 pregnant women	Original and Alpha^	Excluded	BNT162b2	Documented infection	96 (89-100)	7-56	~18 weeks
								Symptomatic COVID-19	97 (91-100)		
								Hospitalization	89 (43-100)		
58	Butt et al* (October 7, 2021) *[Update to June 22 preprint]*	Qatar	Retrospective cohort	814pregnant women	Alpha and Beta^	Excluded	BNT162b2	Documented infection	87.7 (43.5-97.3)	14+	~17 weeks
							mRNA-1273		100.0 (0-100.0)		
57	Prunas et al* (January 27, 2022) *[Update to July 16, 2021 preprint]*	Israel	Retrospective cohort	2,472,502 Israeli individuals from 1,327,647 households	Original and Alpha¶ (pre-Delta^)	Excluded	BNT162b2	Documented infection among household contacts	89.4 (88.7-90)	10-90	~11 weeks
									58.3 (45.8-67.9)	90+	~26.5 weeks
					Delta^				72 (65.9-77)	10-90	~11 weeks
									40.2 (37.6-42.6)	90+	~26.5 weeks
56	Whitaker et al* (January 2, 2022) [*Update to July 9,2021 preprint*]	UK	Prospective cohort	5,591,142 patients reporting to 718 English general practices	Alpha^	Included	BNT162b2	Symptomatic COVID-19: Ages 16-64	48.6 (-61.5-83.7)	14-69	~8 weeks
								Symptomatic COVID-19: Ages 65+	84.7 (77.7-89.5)		
								Immunosuppressed	59.6 (-35.5-86.3)		
							AZD1222	Symptomatic COVID-19: Ages 16-64	67.9 (-1.1-89.8)		
								Symptomatic COVID-19: Ages 65+	81.7 (59.6-91.7)		
								Symptomatic COVID-19: Immunosuppressed	60.0 (-63.6-90.2)		
55	John et al* (July 13,2021)	USA	Retrospective cohort	40,074 patients with cirrhosis within Veterans Health Administration,	Original and Alpha ††	Excluded	BNT162b2 and mRNA-1273	Documented infection	78.6 (25.5-93.8)	7+	~10 weeks
								Hospitalization	100.0 (99-100)		
								COVID-19 related death	100.0 (99-100)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
				propensity matched							
54	Bertollini et al (July 13, 2021)	Qatar	Prospective cohort	10,092 matched pairs of Qatari adults arriving at an international airport.	Original, Alpha and Beta^	Included	BNT162b2 and mRNA-1273	Documented infection	78 (72-83)	14+	~4 weeks
52#	Chemaitelly et al* (July 9, 2021)	Qatar	Test-negative case-control	25,034 matched pairs of adults	Alpha specifically^	Unknown	mRNA-1273	Documented infection	100.0 (CI omitted since there were no events among vaccinated persons)	14+	13 weeks
				52,442 matched pairs of adults	Beta specifically^	Unknown	mRNA-1273	Documented infection	96.0 (90.9-98.2)		
				4,497 matched pairs of adults	Alpha and Beta^	Unknown	mRNA-1273	Severe, critical or fatal disease	89.5 (18.8-98.7)		
								Symptomatic infection	98.6 (92.0-100)		
								Asymptomatic infection	92.5 (84.8-96.9)		
			Retrospective cohort	2520 vaccinated and 73,853 unvaccinated, antibody-negative controls	Alpha specifically^	Excluded	mRNA-1273	Documented infection	100.0 (82.5-100.)	14+	13 weeks
					Beta specifically ^	Excluded	mRNA-1273	Documented infection	87.8 (73.4-95.5)		
51#	Tenforde et al* (August 6, 2021) *[Update to July 8 preprint]*	USA	Test-negative case-control	1212 hospitalized adults from 18 hospitals	Original and Alpha^	Included	BNT162b2/ mRNA-1273	Hospitalization	86.6 (79.0-91.4)	14+	~2 weeks
							BNT162b2		84.7 (74.1-91.0)		
							mRNA-1273		88.9 (78.7-94.)		
					Alpha^	Included	BNT162b2/ mRNA-1273		92.1 (82.3-96.5)		
50	Jara et al (July 7,2021)	Chile	Prospective cohort	10,187,720 adults	Alpha and Gamma^	Excluded	CoronaVac	Documented infection	65.9 (65.2-66.6)	14+	8 weeks
								Hospitalization	87.5 (86.7-88.2)		
								ICU admission	90.3 (89.1-91.4)		

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								Death	86.3 (84.5-87.9)		
49#	Nasreen et al* (February 7,2022) *[Published version of September 30 preprint]*	Canada	Test-negative Case Control	682,071 symptomatic community-dwelling individuals (age 16+) in Ontario	Non-VOC specifically^	Excluded Unknown	BNT162b2	Symptomatic infection	92 (87-95)	14+	~28 weeks
								Hospitalization or death	97 (88-99)		
							mRNA-1273	Symptomatic infection	98 (83-100)		~25 weeks
								Hospitalization or death	100 (no CI provided)		
							AZD1222	Symptomatic infection	100 (no CI provided)		~3 weeks
								Hospitalization or death	100 (no CI provided)		
					Alpha specifically^		BNT162b2	Symptomatic infection	88 (86-90)		~28 weeks
								Hospitalization or death	96 (94-97)		
							mRNA-1273	Symptomatic infection	92 (87-95)		~25 weeks
								Hospitalization or death	95 (92-97)		
							AZD1222	Symptomatic infection	87 (47-97)		~3 weeks
								Hospitalization or death	92 (41-99)		
					Beta specifically^		BNT162b2	Symptomatic infection	86 (0-98)		~28 weeks
								Hospitalization or death	92 (39-99)		
							mRNA-1273	Symptomatic infection	100 (no CI provided)		~25 weeks
								Hospitalization or death	100 (no CI provided)		
							AZD1222	Symptomatic infection	100 (no CI provided)		~3 weeks
					Gamma specifically^		BNT162b2	Symptomatic infection	90 (76-96)		~28 weeks
								Hospitalization or death	94 (59-99)		
							mRNA-1273	Symptomatic infection	100 (no CI provided)		~25 weeks
								Hospitalization or death	100 (no CI provided)		
							AZD1222	Symptomatic infection	100 (no CI provided)		~3 weeks
								Hospitalization or death	100 (no CI provided)		
					Delta specifically^		BNT162b2	Symptomatic infection	92 (89-94))		~28 weeks
								Hospitalization or death	98 (96-99)		
							mRNA-1273	Symptomatic infection	94 (90-97)		~25 weeks
								Hospitalization or death	98 (93-100)		
							AZD1222	Symptomatic infection	88 (68-96)		~3 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								Hospitalization or death	90 (67-97)		
48	Baum et al* (November 18,2021) *[Update to June 28 preprint]*	Finland	Prospective cohort	Two study cohorts: 901,092 Finnish elderly aged 70 years and 774,526 chronically ill aged 16-69 years	Original and Alpha^	Excluded	BNT162b2 & mRNA-1273 (elderly cohort)	Documented infection	75 (65-82)	7+	16 weeks
								Hospitalization	93 (70-98)		
							BNT162b2 & mRNA-1273 (Chronically ill cohort)	Documented infection	77 (65-85)		
								Hospitalization	90 (29-99)		
47	Saciuk et al* (December 30,2021) *[Update to June 27, 2021 preprint]*	Israel	Retrospective cohort	1.6 million members of Maccabi HealthCare HMO ≥16	Original and Alpha¶	Excluded	BNT162b2	Documented infection	93.0 (92.6-93.4)	7+	14 weeks
								Hospitalization	93.4 (91.9-94.7)	7+	
								Death	91.1 (86.5-94.1)	7+	
46	Pawlowski et al.* (June 17, 2021) *[Update to Feb. 18, 2021 preprint]*	USA – Mayo Clinic	Retrospective Cohort	68,266 – propensity matched on, zip, # of PCRs, demographics	Original & Alpha ¥	Excluded	BNT162b2	Documented Infection	88.0 (84.2-91.0)	≥14	~17 weeks (120 days)
								Hospitalization	88.3 (72.6-95.9)	≥14	
								ICU Admission	100.0 (18.7-100)	≥14	
							mRNA-1273	Documented Infection	92.3 (82.4-97.3)	≥14	
								Hospitalization	90.6 (76.5-97.1)	≥14	
								ICU Admission	100.0 (17.9-100)	≥14	
45	Young-Xu et al (October 6, 2021)* *[Update to Jul 14 preprint]*	USA	Test negative case control	77014 veterans aged 65+ within Veterans Health Administration	Original and Alpha ††	Excluded	BNT162b2 & mRNA-1273	Documented infection	94 (92-95)	7+	~8 weeks
								Hospitalization	89 (81-93)		
								Death	98.5 (86.6-99.8)		
								Asymptomatic infection	69.7 (47.7-82.5)		
								Hospitalization	88.4 (74.9-94.7)		
								Deaths	97.0 (91.7-98.9)		
43#	Stowe et al (June 14, 2021)	UK	TND Case-control	Patients seeking emergency care services with subsequent hospitalization	Alpha specifically^	Included	BNT162b2	Hospitalization	95 (78-99)	14+	~20 weeks (but most much less)
							AZD1222		86 (53-96)		
					Delta specifically^		BNT162b2		96 (86-99)		
							AZD1222		92 (75-97)		
42#	Sheikh et al (June 14, 2021)	Scotland	TND	Scottish population	Alpha^	Unknown	BNT162b2	Documented infection	92 (90–93)	14+	~20 weeks (but most much less)
						Unknown	AZD1222	Documented infection	73 (66–78)	14+	
					Delta^	Unknown	BNT162b2	Documented infection	79 (75–82)	14+	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
						Unknown	AZD1222	Documented infection	60 (53–66)	14+	
41	Flacco, Maria et al* (June 10, 2021)	Italy	Retrospective cohort	245,226 individuals	Original and Alpha††	Excluded	BNT162b2	Documented infection	98 (97-99)	14+	~14 weeks
								Hospitalization	99 (96-100)	14+	
								Death	98 (87-100)	14+	
39	Emborg et al. (June 2, 2021) *[Update of Houston-Melms below]*	Denmark	Cohort	46,101 long-term care facility (LTCF) residents, 61,805 individuals 65 years and older living at home but requiring practical help and personal care (65PHC), 98,533 individuals ≥85 years of age (+85), 425,799 health-care workers (HCWs), and 231,858 individuals with comorbidities that predispose for severe COVID-19 disease (SCD)	original & Alpha¶¶	Excluded	BNT162b2	Documented infection	82 (79-84)	>7	10 weeks
								COVID-Hospitalization	93 (89-96)	>7	
								COVID-Mortality	94 (90-96)	>7	
38	Thompson et al* *[updated on June 30,2021]*	USA	Cohort	3975 health care personnel, first responders, and other essential and frontline workers in 8 locations in US	Original	Excluded	BNT162b2	Documented infection	93 (78-98)	≥14	13 weeks
							mRNA-1273	Documented infection	82 (20-96)	≥14	
36	Khan et al (May 31, 2021)	USA	Retrospective cohort	14,697 IBD patients in VA hospitals	Unknown	Included	BNT162b2 & mRNA-1273	Documented infection	69 (44-83)	7+	
								Hospitalization/death	49 (-36-81)	7+	
35	Martinez-Bas et al*	Spain			Alpha	Excluded	BNT162b2	Documented infection	65 (56-73)	14+	12 weeks

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	(May 27, 2021)		Prospective Cohort	20,961 close contacts of confirmed cases				Symptomatic infection	82 (73-88)		
								Hospitalization	94 (60-99)		
34#	Chung et al* (Aug 20, 2021) *[Update to July 26 preprint]*	Canada	Test negative design case control	Adults (16+) in Ontario: 53,270 cases 270,763 controls	Non-VOC^	Excluded	BNT162b2	Symptomatic infection	91 (88-93)	7+	15 weeks
								Hospitalization and Death	96 (82-99)	0+	
							mRNA-1273	Symptomatic infection	94 (86-97)	7+	
								Hospitalization and Death	96 (74-100)	0+	
					Alpha specifically^		BNT162b2 & mRNA-1273	Symptomatic infection	90 (85-94)	7+	
								Hospitalization and Death	94 (59-99)	0+	
					Beta or Gamma specifically^		BNT162b2 & mRNA-1273	Symptomatic infection	88 (61-96)	7+	
							BNT162b2 & mRNA-1273	Hospitalization and Death	100	0+	
33	PHE (May 20, 2021)	UK	Test-negative case control	≥65 years	Alpha	Excluded	BNT162b2	Symptomatic infection	90 (82-95)	≥14	
							AZD1222	Symptomatic infection	89 (78-94)	≥14	
32#	Ranzani et al.* (Aug 20, 2021) *[update to Jul 21 preprint]*	Brazil	Test-negative case control	22,177 70+ year olds in Sao Paulo	Gamma^	Included	Coronavac	Symptomatic infection	46.8 (38.7-53.8)	≥14	~10.5 weeks
								Hospitalization	55.5 (46.5-62.9)		
								Death	61.2 (48.9-70.5)		
31	Ismail et al. (May 12, 2021)	UK	Screening method	13,907 ≥70	Alpha	Included	BNT162b2	Hospitalization in 80+	93 (89-95)	≥14	
30	Pilishvili et al.* (May 14, 2021)	US	Test-negative case control	HCP at 33 U.S. sites across 25 U.S. states	Unknown	Excluded	BNT162b2 & mRNA-1273	Symptomatic infection	94 (87-97)	≥7	
29	Lopez-Bernal et al.* (May 13, 2021) *[Update to Mar 1 preprint]*	UK	Test-negative case control	156,930 UK population over age 70	Alpha^	Included	BNT162b2 AZD1222	Over 80 years: Symptomatic infection	79 (68-86)	≥7	
28	Angel et al.* (May 6, 2021)	Israel	Retrospective cohort	6710 HCWs at a single tertiary care center in	Alpha¶	Excluded	BNT162b2	Symptomatic	97 (94-99)	>7 days	
								Asymptomatic	86 (69-97)		
27#	Abu-Raddad et al.* (July 8, 2021)	Qatar	Test-negative case-control	Qatari adults	Alpha specifically^	Unknown	BNT162b2	CC Alpha documented infection	90 (86-92)	≥14	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
								CC Alpha severe/fatal infection	100 (82-100)		
					Beta specifically^			CC Beta documented infection	75 (71-79)		
								CC Beta severe/fatal infection	100 (74-100)		
			Retrospective cohort	Qatari adults	Alpha specifically^	Unknown	BNT162b2	Cohort documented infection Alpha	87 (82-91)		
					Beta specifically^			Cohort documented infection Beta	72 (66-77)		
26	Haas et al. * (May 5, 2021) *[Update to Mar 24 preprint]*	Israel	Retrospective cohort	Israeli population ≥16 years	Alpha^	Excluded	BNT162b2	Documented infection	95.3 (94.9-95.7)	≥7 days	
								Asymptomatic infection	91.5 (90.7-92.2)		
								Symptomatic infection	97.0 (96.7-97.2)		
								Hospitalization	97.2 (96.8-97.5)		
								Severe/ critical hospitalization	97.5 (97.1-97.8)		
								Death	96.7 (96.0-97.3)		
25	Corchado-Garcia et al.* (November 2, 2021) *[Update to April 30 preprint]*	USA	Retrospective cohort	97,787 adults in the Mayo Clinic Network	Alpha and Delta^	Excluded	Ad26.COV2.S	Documented infection	74.2 (64.9-81.6)	≥15	
24	Fabiani et al.* (Apr 29, 2021)	Italy	Retrospective cohort	9,878 HCWs	Unknown	Excluded	BNT162b2	Documented infection	95 (62-99)	≥7 days	
								Symptomatic infection	94 (51-99)		
22	Tenforde et al.* (Apr 28, 2021)	USA	Test-negative case-control	Hospitalized adults ≥65 years	Original and Alpha¥	Unknown	BNT162b2 & mRNA-1273	Hospitalization	94 (49-99)	≥14 days	
21	Goldberg et al.* (March 30, 2022) *[Update to Apr 24, 2021 preprint]*	Israel	Prospective cohort	5,600,000+ individuals ≥16 years	Alpha^	Excluded	BNT162b2	Documented infection	94.5 (94.3-94.7)	≥14 days	~8 weeks
								Hospitalization	95.8 (95.2-96.2)		
								Severe disease	96.3 (95.7-96.9)		
								Death	96 (94.9-96.9)		
20	Pritchard et al.*	UK					BNT162b2	Documented infection	80 (74-85)	≥0 days	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
	(Jun 9, 2021) *[Update to Apr 23 preprint]*		Prospective cohort	373,402 individuals ≥16 years	Alpha & Original^	Excluded		Symptomatic disease	95 (91-98)		
							AZD1222	Documented infection	79 (65-88)		
								Symptomatic disease	92 (78-97)		
18	Hall et al.* (Apr 23, 2021) *[Update to Feb 21 preprint]*	UK – SIREN study	Prospective Cohort (Person-time)	23,324 healthcare workers	Alpha^	Excluded	BNT162b2	Documented infection	86 (76-97)	≥7	
17	Mason et al.* (October 18, 2021) *[Update to Apr 22 preprint]*	UK - England	Case-control	170,226 80-83-year-olds	Alpha^	Excluded	BNT162b2	Documented infection	70 (55- 80)	35-41	
								Hospitalization	75 (52-87)	35-41	
								Emergency visit	79(60-90)		
16	Bjork et al.* (September 29, 2021) *[Update to Apr 21 preprint]*	Sweden	Retrospective cohort	805,741 Swedish adults aged 18-64 years	Original & Alpha^	Unknown	BNT162b2	Documented infection	86 (72-94)	≥7	4 weeks
14	Andrejko et al.* (Jul 20, 2021) *[update to May 25 preprint]*	USA	Test-negative case control	1023 California adults ≥18 years	B.1.427/ B.1.429 & Alpha^	Excluded	BNT162b2 & mRNA-1273	Documented infection	87.4 (77.2-93.1)	≥15	~14 weeks
								Asymptomatic infection	68.3 (27.9-85.7)	≥15	
								Symptomatic infection	91.3 (79.3-96.3)	≥15	
								Hospitalization	100	≥15	
							BNT162b2	Documented infection	87.0 (68.6-94.6)	≥15	
							mRNA-1273	Documented infection	86.2 (68.4-93.9)	≥15	
13	Regev-Yochay et al.* (July 7,2021) [*Update to April 9 preprint]*	Israel	Prospective cohort	3578 HCWs in one Israeli health system	Alpha¶	Included	BNT162b2	Asymptomatic infection	65 (45-79)	≥11	
								Asymptomatic infection presumed infectious (Ct< 30)	70 (43-84)	≥11	
								Symptomatic infection	90 (84-94)	≥11	
								Symptomatic infection presumed infectious (CT<30)	88 (80-94)	≥11	

No.	Reference (date)	Country	Design	Population	Dominant Variants	History of COVID	Vaccine Product	Outcome Measure	Primary Series VE % (95% CI)	Days post Final dose	Max Duration of follow up after fully vaccinated
11	Thompson et al.* (Mar 29, 2021)	USA	Prospective cohort	3,950 healthcare workers in eight US sites	Original[¥]	Excluded	BNT162b2 & mRNA1273	Documented infection	90 (68-97)	≥14	
6	Tande et al.* (Mar 10, 2021)	USA – Mayo Clinic	Retrospective Cohort	Asymptomatic screening of 39,156 patients: pre-surgical, pre-op PCR tests	original[¥]	Included	BNT162b2 & mRNA-1273	Asymptomatic infection	80 (56-91)	>0	
							BNT162b2	Asymptomatic infection	80 (56-91)	>0	
5	Mousten-Helms et al. (Mar 9, 2021)	Denmark	Retrospective Cohort	Long term care facilities in Denmark - 39,040 residents, 331,039 staff	original & Alpha[¶¶]	Excluded	BNT162b2	LTCF Resident: Documented Infection	64 (14-84)	>7	
								LTCF Staff: Documented Infection	90 (82-95)	>7	
3	Dagan et al.* (Feb. 24, 2021)	Israel – Clalit Health System	Retrospective Cohort	596,618 – matched on demographics, residence, clinical characteristics	original & Alpha^	Excluded	BNT162b2	Documented infection	92 (88-95)	>7	
								Symptomatic infection	94 (87-98)	>7	
								Hospitalization	87 (55-100)	>7	
								Severe disease	92 (75-100)	>7	
2	Public Health England – Feb. (Feb. 22, 2021)	UK - England	Screening Method	43,294 cases, with England as source population	Alpha^	Included	BNT162b2	Over 80 years: Symptomatic infection	88 (84-90)	7	

Purple text indicates new or updated study.
Product Manufacturers: BNT162b2 (Pfizer), mRNA-1273 (Moderna), AZD1222 (Astra-Zeneca), Ad26.COV2.S (Janssen), Coronavac
[±]Unless noted otherwise, days post 1st dose are prior to receiving dose 2.
‡Unclear if 1st dose VE estimates includes any individuals who received a second dose.
*Manuscripts with an asterisk (*) are peer-reviewed publications.
^Indicates predominant variant identified by study authors. If no ^ then variants identified through secondary source when possible. Please see additional footnotes.
¶The rise of SARS-CoV-2 variant Alpha in Israel intensifies the role of surveillance and vaccination in elderly | medRxiv
[¥]CDC Says More Virulent British Strain Of Coronavirus Now Dominant In U.S. : Coronavirus Updates : NPR
[£]Coronavirus (COVID-19) Infection Survey, UK - Office for National Statistics
¶¶Denmark logs more contagious COVID variant in 45% of positive tests | Reuters
[¥¥]COVID variant first detected in UK now dominant strain in Spain
[££]Reporte-circulacion-variantes-al-9.04.21-PUBLICADO-FINAL.pdf (minsal.cl)
[††]Based on https://outbreak.info/location-reports or www.ourworldindata.org
[γ]https://www.gov.uk/government/publications/covid-19-variants-genomically-confirmed-case-numbers/variants-distribution-of-cases-data
[#] Manuscripts that are cited in the WHO COVID-19 Weekly Epidemiological Updates (see Special Focus Update on SARS-CoV-2 Variants of Interest and Variants of Concern, Table 3, included in every other Weekly Epidemiological Update): https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports.

[xx]VE estimate presented with 99% CIs.
[xxx]VE estimates are not adjusted for calendar time.

1.1 Inclusion criteria for VE studies

Note: All VE studies now must meet these criteria to be in the VE table:

- Published or preprint studies (not press release, presentations, media)
- Must have confidence intervals around VE, except in instances where it is not possible to calculate
- Needs to include persons with and without the clinical outcome under investigation and with and without vaccination (i.e. a proper comparison group). This excludes case only studies (e.g., impact studies and studies of risk of progression to severe disease). Exceptions: transmission studies which evaluate VE against secondary infection from vaccinated and unvaccinated SARS-CoV-2 cases only and booster dose VE studies in which the reference group is persons having completed primary series vaccination.
- No modeled comparison group nor comparison to historical cohort
- The study design should account for confounding and/or VE estimate should be adjusted or state adjustment made no difference
- Outcomes must be lab confirmed, not syndromic
- At least 90% of participants must have documented vaccination status rather than relying on recall
- VE must be for a single vaccine schedule schedule (i.e. every individual included contributing to a VE estimate must have received the same vaccine(s) in the same order). The exceptions are for 1) studies assessing the combined VE of BNT162b2 (Pfizer) and mRNA-1273 (Moderna) vaccines, 2) second or third booster dose studies, 3) studies of vaccine effectiveness against transmission (due to the scarcity of transmission studies), and 4) studies evaluating 'up-to-date' vaccination.
- No significant bias that likely affects results
- Cannot include persons receiving their final dose in the past 0-12 days in the unvaccinated comparison group (or in the primary series comparison group if evaluating relative VE of a booster dose).
- Cannot calculate VE by comparing the vaccinated group to itself early post vaccination (e.g. day 14-28 vs day 0-13).
- Must include VE of complete primary series or booster dose vaccination (e.g. single dose VE of two or three dose vaccines not included). *Note this criterion was removed for all vaccines except inacativated vaccines as of November 10, 2023 with the release of the updated WHO roadmap on uses of COVID-19 vaccines which recommends a single dose for persons who have never received a COVID-19 vaccine, with the exception of inactivated vaccines.*

1.2 VE Studies that do not meet criteria (in case of interest):

1. Hunter P and Brainard J. Estimating the effectiveness of the Pfizer COVID-19 BNT162b2 vaccine after a single dose. A reanalysis of a study of 'real-world' vaccination outcomes from Israel. *medRxiv*. Published online 2021:2021.02.01.21250957. doi: 10.1101/2021.02.01.21250957

2. Institut National de Santé Publique du Québec. Preliminary Data on Vaccine Effectiveness and Supplementary Opinion on the Strategy for Vaccination Against COVID-19 in Quebec in a Context of Shortage. Gouvernement du Québec. 2021:Publication No 3111. Available at: https://www.inspq.qc.ca/sites/default/files/publications/3111-vaccine-effectiveness-strategy-vaccination-shortage-covid19.pdf.
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4. Aran D. Estimating real-world COVID-19 vaccine effectiveness in Israel using aggregated counts. Published online Mar 4, 2021. Available at: https://github.com/dviraran/covid_analyses/blob/master/Aran_letter.pdf.
5. Shah ASV, Gribben C, Bishop J, et al. Effect of vaccination on transmission of COVID-19: an observational study in healthcare workers and their households. *medRxiv*. Published online 2021:2021.03.11.21253275. doi: 10.1101/2021.03.11.21253275
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14. Lopez Bernal J, Andrews N, Gower C, et al. Effectiveness of BNT162b2 mRNA vaccine and ChAdOx1 adenovirus vector vaccine on mortality following COVID-19. *medRxiv*. Published online 2021:2021.05.14.21257600 doi: 10.1101/2021.05.14.21257218

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