Supplementary material

Supplement 1. Evidence search reports in electronic databases

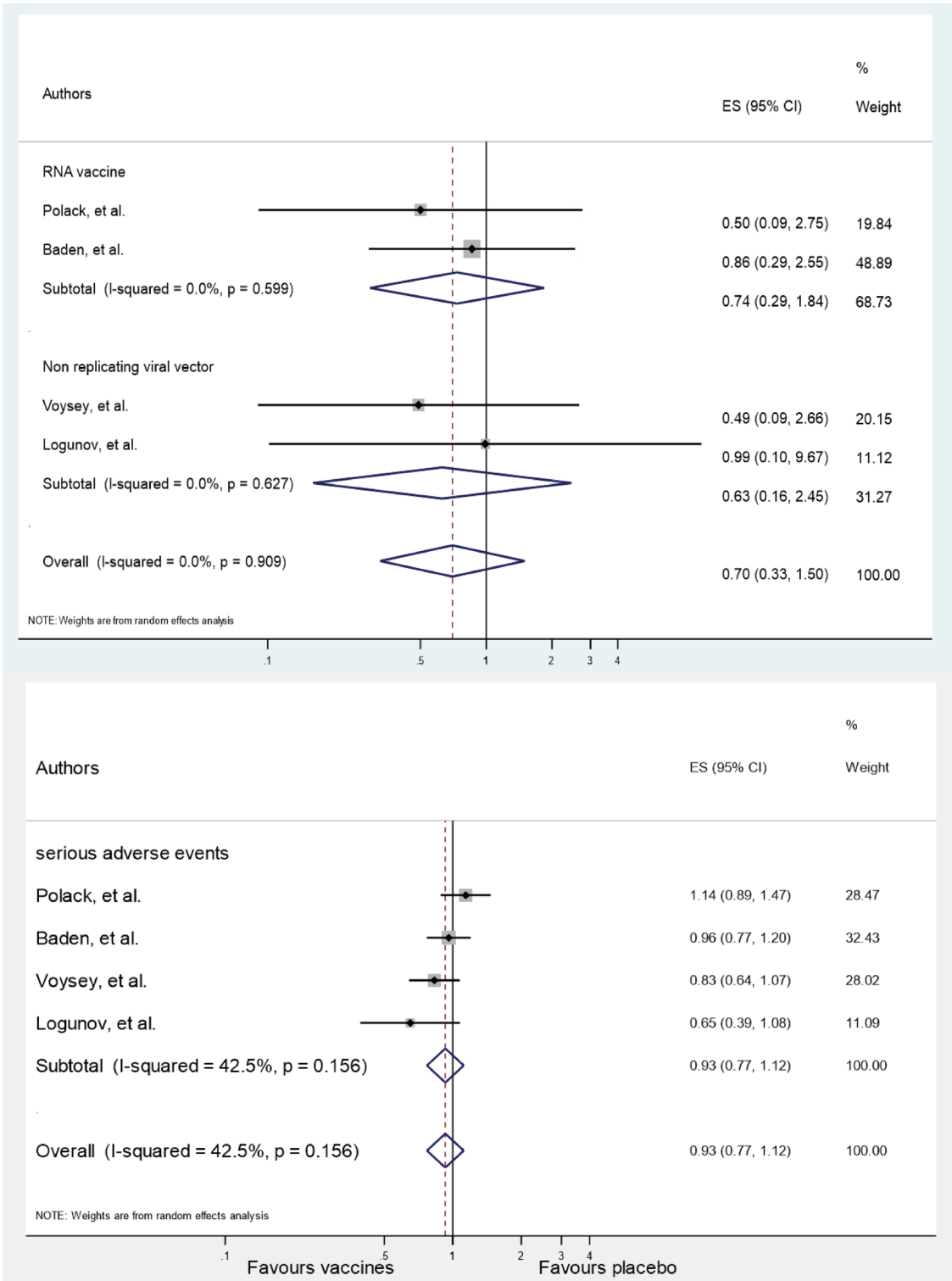
Data source	Search equation
PubMed/MEDLINE	(((((("vaccine"[All Fields] OR "vaccination"[All Fields]) AND "covid19"[All Fields]) OR "coronavirus"[All Fields] OR "sarscov2"[All Fields]) AND "bnt162b2"[All Fields]) OR "chadox1"[All Fields] OR "azd1222"[All Fields] OR "sputnik"[All Fields] OR "mrna"[All Fields]) AND ((randomizedcontrolled trial[Filter]) AND (2020:2021[pdat]))
Cochrane Embase	#1 Covid19 #2 vaccines in Trials #3 #1 AND #2 #4 bnt162b2 mrna vaccine #5 chadox1 #6 azd1222 #7 Gam-COVID-Vac #8 sputnik3 #9 mRNA-1273 #10 #4 OR #5 OR #6 OR #7 OR #8 OR #9 #11 #3 AND # 10 #12 #1 AND #2 AND # 10
Google Scholar	“vaccine" OR "vaccination" AND “Covid19”

Supplement 2. Risk of bias in randomized controlled trials

Study	Randomisation	Deviations from intervention	Missing outcome data	Measurement of the outcome	Selection of the reported results	Overall risk of bias	Outcome	Details
Polack, 2020 (24) BNT162b2	+	±	+	+	+	±	Low risk of bias: Adverse events; death from all causes Some concerns risk: Symptomatic SARS-CoV-2 infection confirmed by laboratory	Analysed by per-protocol and not by intention to treat; losses to follow-up were not described.
Baden, 2020 (25) mRNA-1273	+	±	+	+	+	±	Low risk of bias: Adverse events; death from all causes Some concerns risk: Symptomatic SARS-CoV-2 infection confirmed by laboratory and severe case of COVID-19	Analysed by per-protocol and not by intention to treat
Voysey, 2020 (26) ChAdOx1	+	±	+	+	+	±	Low risk of bias: Adverse events; death from all causes Some concerns risk: Symptomatic SARS-CoV-2 infection confirmed by laboratory	Analysed by per- protocol and not by intention to treat; Vaccine administration errors
Logunov, 2021 (28) Gam-COVID-Vac rAd26-S/ rAd5-S	+	±	+	+	+	±	Some concerns: Symptomatic SARS-CoV-2 infection confirmed by laboratory; severe case of COVID-19; Adverse events; death from all causes	Analysed by per- protocol and not by intention to treat; Vaccine administration errors

Supplement 3

Figure 1s. Forest plots with summary effect sizes per vaccine platform type: all-cause mortality



Supplement 4s. GRADE assessment

	Certainty assessment							No. of patients		Effect			
	No. of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Vaccine	Placebo	Relative (95% CI)	Absolute (95% CI)	Certainty	Importance
Polack, 2020 (15) Vaccine: BNT162b2	1	Randomized trials	Not serious	Not serious	Serious[a b]	Not serious	None	8/17,411	162/17,511	RR=0.05 (0.02 to 0.10)		⊕⊕⊕◯ Moderate	Critical
Baden, 2020 (16) Vaccine: mRNA-1273	1	Randomized trials	Not serious	Not serious	Serious[a b]	Not serious	None	11/14,134	185/14,073	RR=0.06		⊕⊕⊕◯ Moderate	Critical
Voysey, 2020 (17,18) Vaccine: ChAdOx1	1	Randomized trials	Not serious	Not serious	Serious[a b]	Not serious	None	84/8,597	248/8,580	RR=0.33 (0.26 to 0.43)		⊕⊕⊕◯ Moderate	Critical
Logunov, 2021 (19) Vaccine: Gam-COVID-Vac rAd26-S/ rAd5-S	1	Randomized trials	Not serious	Not serious	Serious[a b]	Not serious	None	13/14,094	47/4,601	RR=0.09 (0.05 to 0.16)		⊕⊕⊕◯ Moderate	Critical

CI: Confidence interval; RR: Risk ratio

Explanations

a. Data are from an interim analysis of the trial, with a short duration of follow-up. Estimates may change over a longer duration of follow-up.

b. The population included in the RCT may not represent all persons aged ≥16 years (BNT162b2) or ≥18 years (mRNA-1273; ChAdOx1; Gam-COVID-Vac rAd26-S/rAd5-S)

Severe or critical disease due to COVID-19

	Certainty assessment							No. of patients		Effect			
	No. of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Vaccine	Placebo	Relative (95% CI)	Absolute (95% CI)	Certainty	Importance
Polack, 2020 (24) Vaccine: BNT162b2	1	Randomized trials	Not serious	Not serious	Serious[a b]	Very serious [c]	None	1/21,314	9/21,259	RR=0.11 (0.01 to 1.81)		⊕◯◯◯ Very low	Critical
Baden, 2020 (25) Vaccine: mRNA-1273	1	Randomized trials	Not serious	Not serious	Serious[a b]	Not serious	None	0/14,134	30/14,073	RR=0.02 (0.00 to 0.27)		⊕⊕⊕◯ Moderate	Critical
Voysey, 2020 (26,27) Vaccine: ChAdOx1	1	Randomized trials	Not serious	Not serious	Serious[a b]	Very serious [c]	None	0/12,021	1/11,724	RR=0.33 (0.01 to 7.98)		⊕◯◯◯ Very low	Critical
Logunov, 2021 (28) Vaccine: Gam-COVID-Vac rAd26-S/ rAd5-S	1	Randomized trials	Not serious	Not serious	Serious[a b]	Very serious [c]	None	0/14,964	20/4,902	RR=0.00 (0.00 to 0.06)		⊕◯◯◯ Very low	Critical

CI: Confidence interval; RR: Risk ratio

Explanations

Data are from an interim analysis of the trial, with a short duration of follow-up. Estimates may change over a longer duration of follow-up.

The population included in the RCT may not represent all persons aged ≥16 years (BNT162b2) or ≥18 years (mRNA-1273; ChAdOx1; Gam-COVID-Vac rAd26-S/rAd5-S)

Imprecision was downgraded by 2 levels because the 95% of the relative risk (RR) was sufficiently wide that the estimate could include appreciable harm or benefit of the intervention. This outcome may be imprecise due to the small number of events reported during the observation period.

Any adverse event

	Certainty assessment							No. of patients		Effect			
	No. of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Vaccine	Placebo	Relative (95% CI)	Absolute (95% CI)	Certainty	Importance
Polack, 2020 (15) Vaccine: BNT162b2	1	Randomized trials	Not serious	Not serious	Serious[a b]	Not serious	None	5,770/21,621	2,638/21,631	RR=2.19 (2.10 to 2.28)		⊕⊕⊕◯ Moderate	Critical
Baden, 2020 (16) Vaccine: mRNA-1273	1	Randomized trials	Not serious	Not serious	Serious[a b]	Not serious	None	3,632/15,185	3,277/15,166	RR=1.11 (1.06 to 1.15)		⊕⊕⊕◯ Moderate	Critical
Voysey, 2020 (17,18) Vaccine: ChAdOx1	1	Randomized trials	Not serious	Not serious	Serious[a b]	Not serious	None	95/12,021	126/11,724	RR=0.74 (0.56 to 0.96)		⊕⊕⊕◯ Moderate	Critical
Logunov, 2021 (19) Vaccine: Gam-COVID-Vac rAd26-S/ rAd5-S	--	--	--	--	--	--	--	--	--	--		--	--

CI: Confidence interval; RR: Risk ratio

Explanations

a. Data are from an interim analysis of the trial, with a short duration of follow-up. Estimates may change over a longer duration of follow-up.

b. The population included in the RCT may not represent all persons aged ≥16 years (BNT162b2) or ≥18 years (mRNA-1273; ChAdOx1; Gam-COVID-Vac rAd26-S/rAd5-S)

Serious adverse event

	Certainty assessment							No. of patients		Effect			
	No. of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Vaccine	Placebo	Relative (95% CI)	Absolute (95% CI)	Certainty	Importance
Polack, 2020 (15) Vaccine: BNT162b2	1	Randomized trials	Not serious	Not serious	Serious[a b]	Very serious [c]	None	126/21,621	111/21,631	RR=1.14 (0.88 to 1.46)		⊕◯◯◯ Very low	Critical
Baden, 2020 (16) Vaccine: mRNA-1273	1	Randomized trials	Not serious	Not serious	Serious[a b]	Very serious [c]	None	147/15,185	153/15,166	RR=0.96 (0.77 to 1.20)		⊕◯◯◯ Very low	Critical
Voysey, 2020 (17,18) Vaccine: ChAdOx1	1	Randomized trials	Not serious	Not serious	Serious[a b]	Very serious [c]	None	108/12,284	127/11,962	RR=0.83 (0. 64 to 1.07)		⊕◯◯◯ Very low	Critical
Logunov, 2021 (19) Vaccine: Gam-COVID-Vac rAd26-S/ rAd5-S	1	Randomized trials	Not serious	Not serious	Serious[a b]	Very serious [c]	None	45/16,427	23/5,435	RR=0.65 (0. 39 to 1.07)		⊕◯◯◯ Very low	Critical

CI: Confidence interval; RR: Risk ratio

Explanations

a. Data are from an interim analysis of the trial, with a short duration of follow-up. Estimates may change over a longer duration of follow-up.

b. The population included in the RCT may not represent all persons aged ≥16 years (BNT162b2) or ≥18 years (mRNA-1273; ChAdOx1; Gam-COVID-Vac rAd26-S/rAd5-S)

c. Imprecision was downgraded by 2 levels because the 95% of the relative risk (RR) was sufficiently wide that the estimate could include appreciable harm or benefit of the intervention. This outcome may be imprecise due to the small number of events reported during the observation period.

All-cause mortality

	Certainty assessment							No. of patients		Effect			
	No. of studies	Design	Risk of bias	Inconsistency	Indirectness	Imprecision	Other considerations	Vaccine	Placebo	Relative (95% CI)	Absolute (95% CI)	Certainty	Importance
Polack, 2020 (15) Vaccine: BNT162b2	1	Randomized trials	Not serious	Not serious	Serious[a b]	Very serious [c]	None	2/21,621	4/21,631	RR=0.50 (0.09 to 2.73)		⊕◯◯◯ Very low	Critical
Baden, 2020 (16) Vaccine: mRNA-1273	1	Randomized trials	Not serious	Not serious	Serious[a b]	Very serious [c]	None	6/15,185	7/15,166	RR=0.86 (0.29 to 2.55)		⊕◯◯◯ Very low	Critical
Voysey, 2020 (17,18) Vaccine: ChAdOx1	1	Randomized trials	Not serious	Not serious	Serious[a b]	Very serious [c]	None	1/12,282	4/11,962	RR=0.49 (0.09 to 2.66)		⊕◯◯◯ Very low	Critical
Logunov, 2021 (19) Vaccine: Gam-COVID-Vac rAd26-S/ rAd5-S	1	Randomized trials	Not serious	Not serious	Serious[a b]	Very serious [c]	None	3/16,427	1/5,435	RR=0.99 (0.10 to 9.54)		⊕◯◯◯ Very low	Critical

CI: Confidence interval; RR: Risk ratio

Explanations

a. Data are from an interim analysis of the trial, with a short duration of follow-up. Estimates may change over a longer duration of follow-up.

b. The population included in the RCT may not represent all persons aged ≥16 years (BNT162b2); ≥18 years (mRNA-1273; ChAdOx1; Gam-COVID-Vac rAd26-S/rAd5-S)Imprecision was downgraded by 2 levels because the 95% of the relative risk (RR) was sufficiently wide that the estimate could include appreciable harm or benefit of the intervention. This outcome may be imprecise due to the small number of events reported during the observation period. CI: Confidence interval; RR: Risk ratio