

Supplemental material

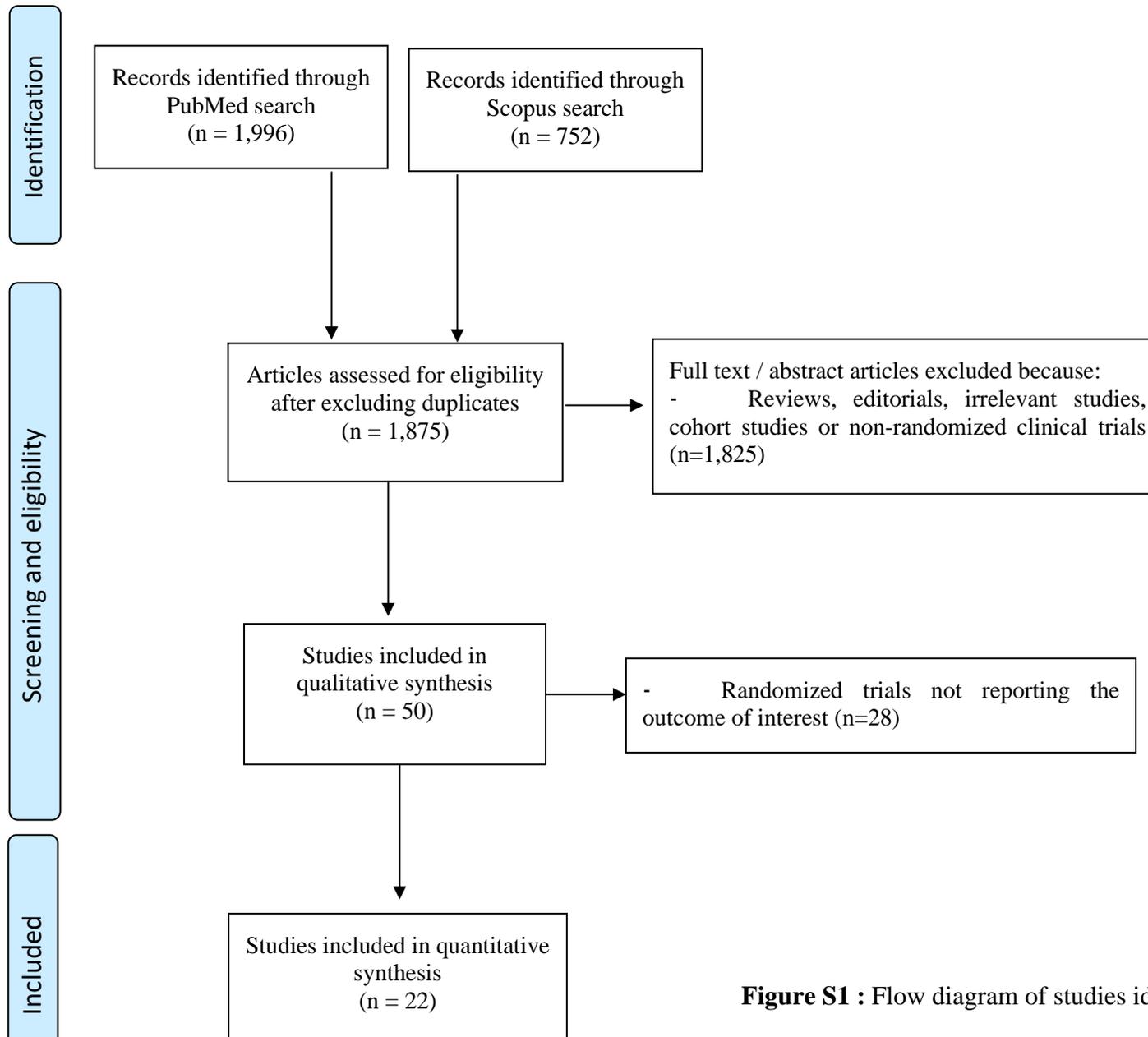


Figure S1 : Flow diagram of studies identified, screened and included in the meta-analysis

Table S1. Studies of immunomodulatory agents for COVID-19

Drug	Drug class	Number of clinical trials (completed or ongoing)	Available studies
tocilizumab	anti-IL6	72	Clinical trials
adalimumab	anti-TNF α	1	Clinical trial
infliximab	anti-TNF α	5	Clinical trials
baricitinib	Jak inhibitor	18	Clinical trials
ruxolitinib	Jak inhibitor	16	Clinical trials
interferon	Signaling protein - Immunomodulatory agent	141	Clinical trials
IVIG	Immunomodulatory agent	23	Clinical trials
colchicine	Anti-inflammatory		Clinical trials
GM-CSF (e.g. sargramostin)	GM-CSF	41	Clinical trials
anakinra	anti-IL1	31	Clinical trials
hyperimmune or convalescent plasma	-	460	Clinical trials

GM-CSF: Granulocyte-macrophage colony-stimulating factor, IL: interleukin, IVIG: intravenous immunoglobulin, Jak: Janus kinase, TNF: tumor necrosis factor

B.

	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding of participants and personnel (performance bias)	Blinding of outcome assessment (detection bias)	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias
Ali et al. 2021	+	+	+	+	+	+	
Angus et al. 2020			+	+	+	+	
Carrichio et al. 2021		+	+	+	+		
Cavalcanti et al. 2020	+	+	+	+	+	+	
Dequin et al. 2020	+	+	+	+	+	+	
Dubee et al. 2021	+	+	+	+	+	+	
Gordon et al. 2021	+		+	+	+	+	
Guimaraes et al. 2021	+	+	+	+	+	+	
Hermine O et al 2020	+		-		+	+	
Kalil et al.2021			+	+	+	+	
Kyriazopoulou et al. 2021	+	+	+	+	+	+	
Marconi et al. 2021	+	+	+	+	+	+	
Rosas et al. 2020	+		+	+	+	+	
Salama et al. 2021	+	+	+	+	+	+	
Salvarani C et al 2020	+	-			+	+	
Self et al. 2020	+		+	+	+	+	
Soin et. al 2021	+	+			+	+	
Stone et al. 2020	+	+		+	+	+	
Tomazini et al. 2020	+	+			+	+	
Veiga et al. 2021	+	+	+	+	+	+	
Vlaar A PJ et al 2020	+		+	+	+	+	
Xavier et al. 2021	+	+	+	+	+	+	

A.

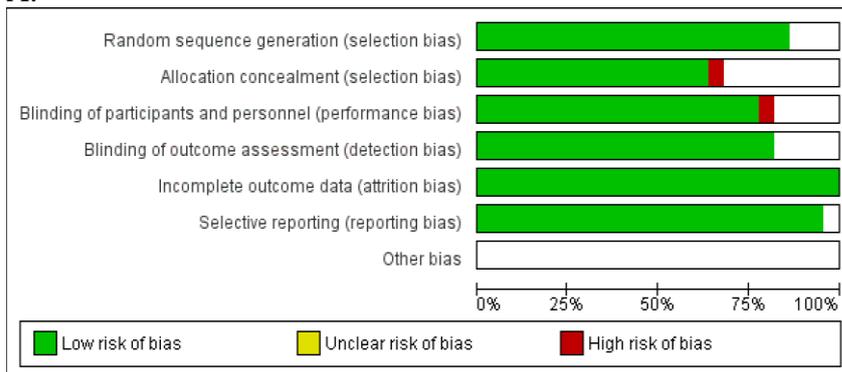


Figure S2.A.Risk of bias graph: review authors' judgements about each risk of bias item presented as percentages across all included studies; **B.**Risk of bias summary: review authors' judgements about each risk of bias item for each included study.

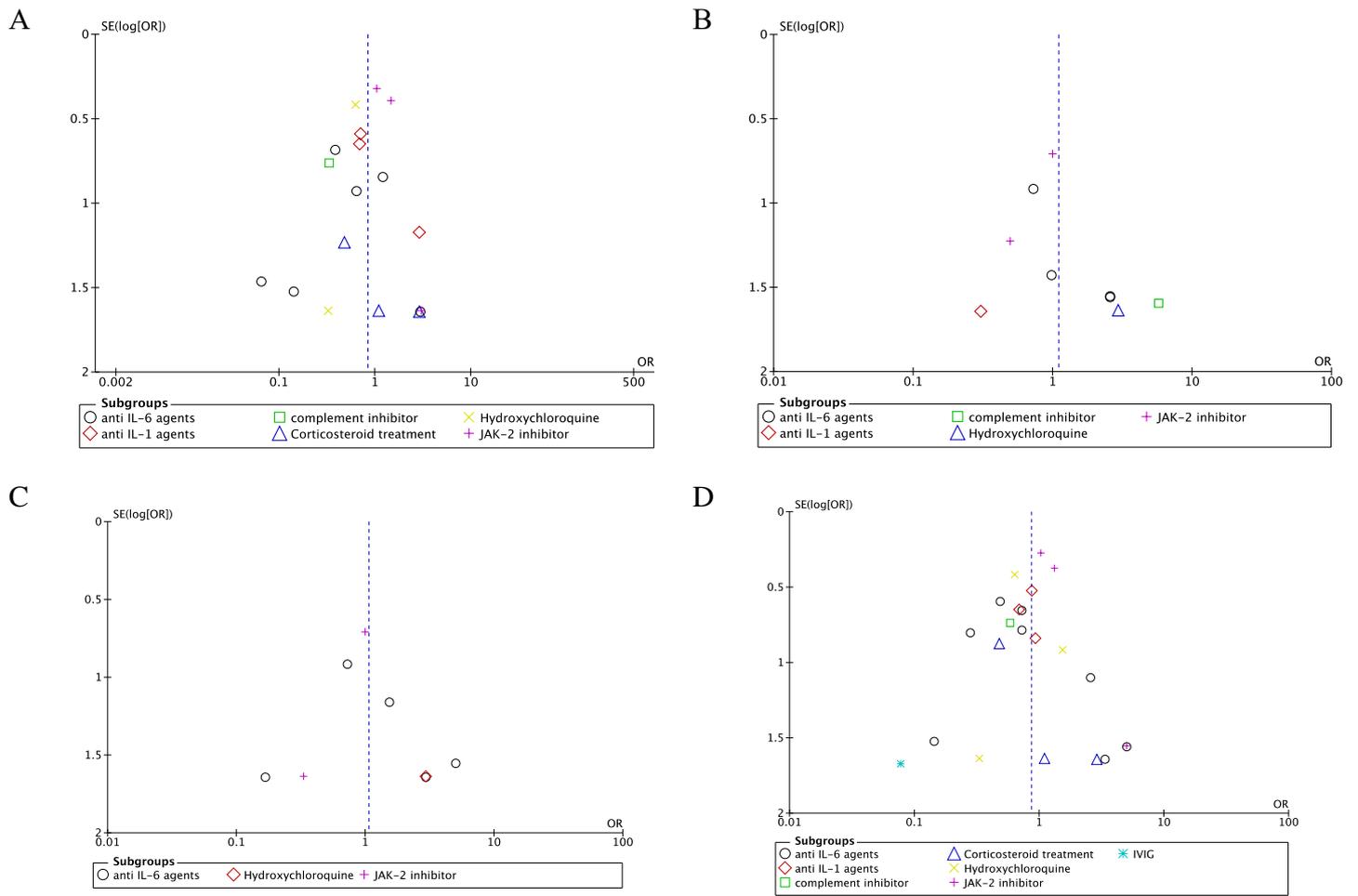


Figure S3. Diagnostic plots for each outcome based on the use of immunomodulatory agents or placebo. Panel A: Venous thromboembolism, Panel B: Ischemic Stroke or systemic embolism, Panel C: myocardial infarction, Panel D: Any thromboembolic event

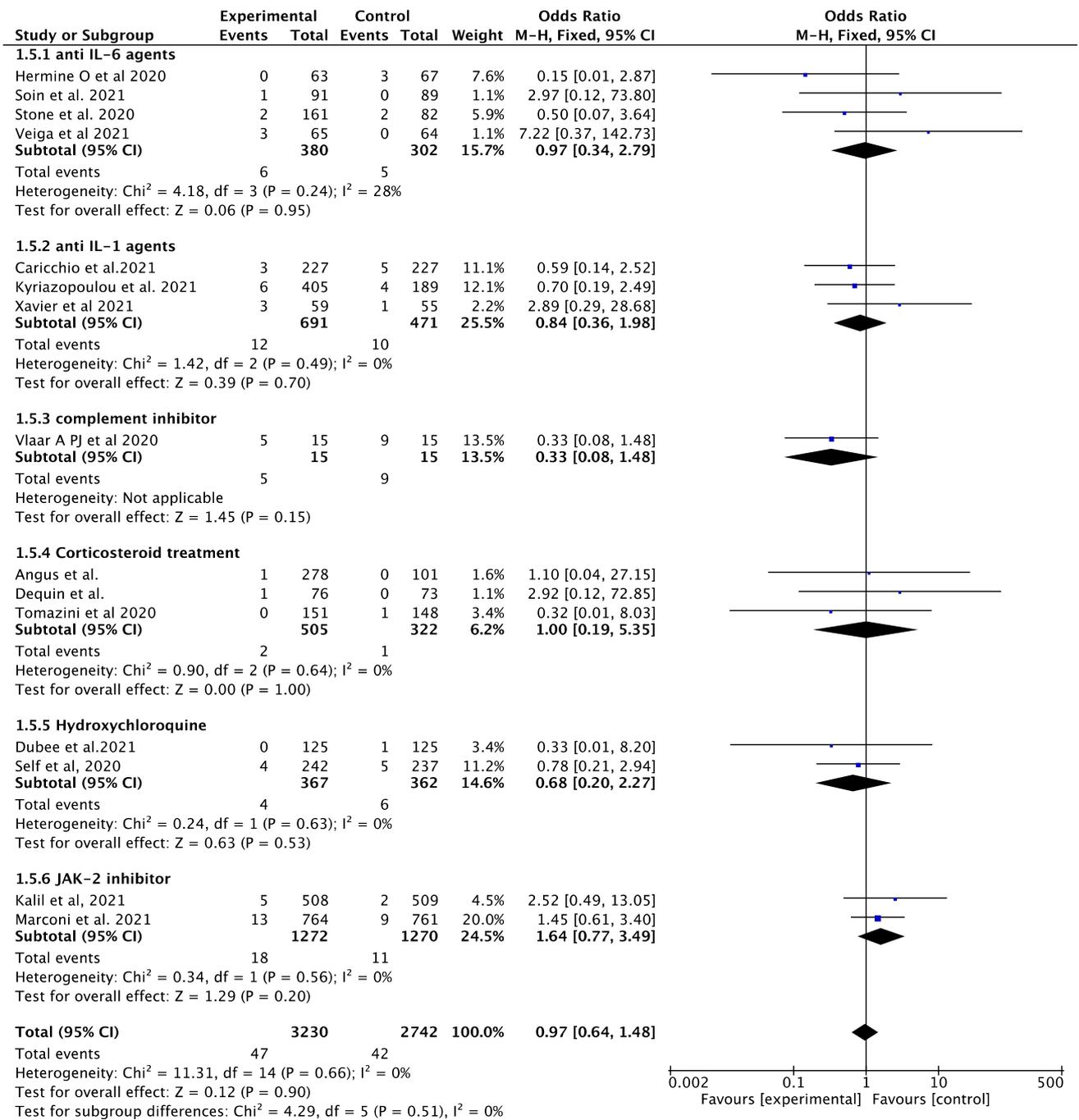


Figure S4: Odds ratio (OR) and 95% Confidence Intervals for the occurrence of pulmonary embolism among hospitalized COVID-19 patients assigned to immunomodulatory agents as an add-on to SOC vs. SOC only. Boxes represent the OR and lines represent the 95% CIs for individual studies. The diamonds and their width represent the pooled ORs and the 95% CIs, respectively. CI, confidence intervals for the Mantel-Hansen estimator, I^2 : heterogeneity

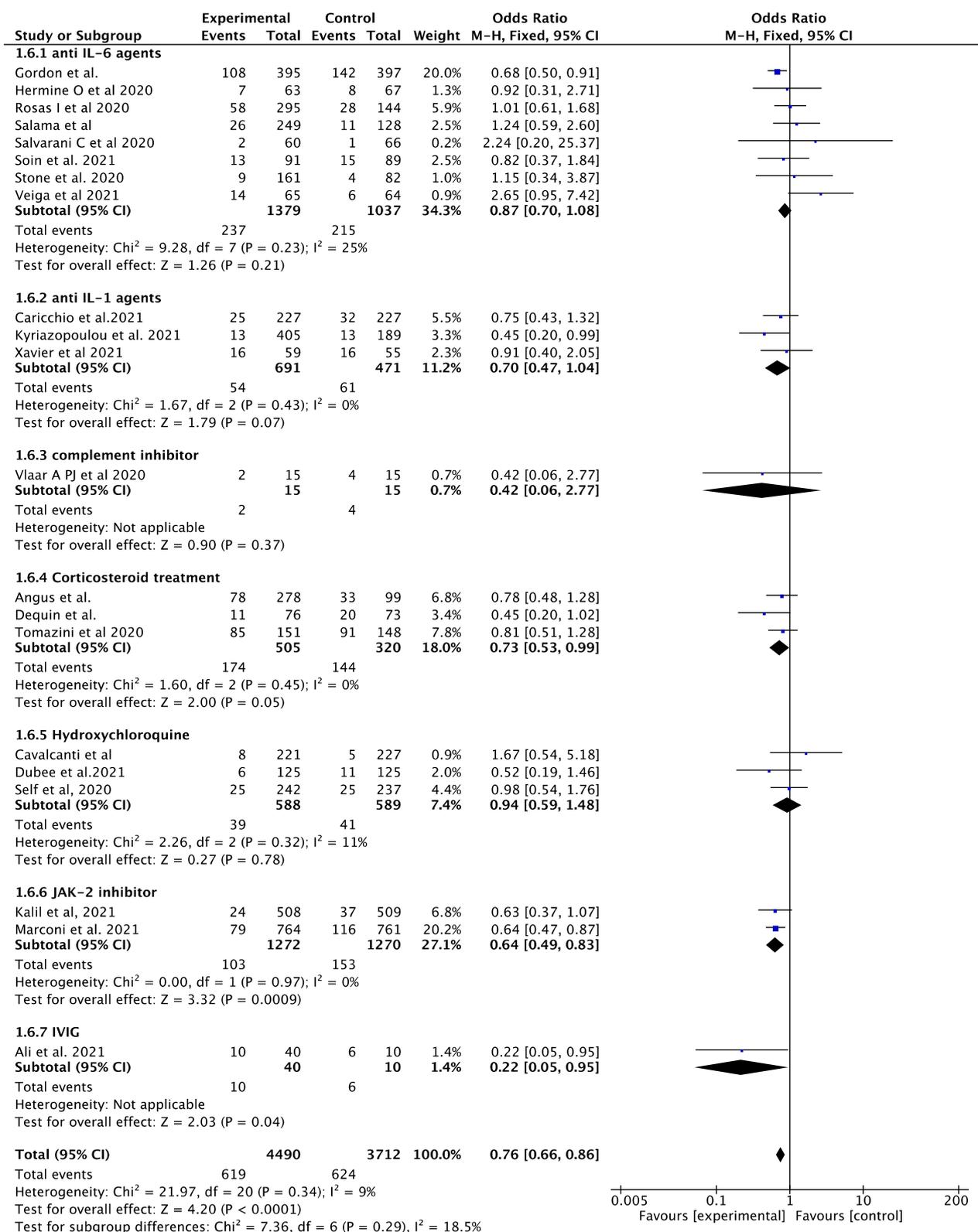


Figure S5: Odds ratio (OR) and 95% Confidence Intervals for mortality among hospitalized COVID-19 patients assigned to immunomodulatory agents as an add-on to SOC vs. SOC only. Boxes represent the OR and lines represent the 95% CIs for individual studies. The diamonds and their width represent the pooled ORs and the 95% CIs, respectively. CI, confidence intervals for the Mantel-Hansen estimator, I²: heterogeneity