

Supplementary Materials

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Supplementary Method 1

Database search results

Database	Search strategy	Articles
PubMed	(((("Transcatheter Aortic Valve Replacement"[Mesh]) OR (Transcatheter Aortic Valve Replacement[Title/Abstract])) OR (Transcatheter Aortic Valve Implantation[Title/Abstract])) AND (((((((((((("Bicuspid Aortic Valve Disease"[Mesh]) OR (Bicuspid Aortic Valve Disease[Title/Abstract])) OR (Bicuspid Aortic Valve[Title/Abstract])) OR (Bicuspid Aortic Valves[Title/Abstract])) OR (Valve, Bicuspid Aortic[Title/Abstract])) OR (Aortic Valve, Bicuspid[Title/Abstract])) OR (Aortic Valve Disease 1[Title/Abstract])) OR (Two-Raphe Bicuspid Aortic Valve[Title/Abstract])) OR (Bicuspid Aortic Valve, Two-Raphe[Title/Abstract])) OR (Bicuspid Aortic Valve, Two Raphe[Title/Abstract])) OR (Double Raphe Bicuspid Aortic Valve[Title/Abstract])) OR (Two Raphe Bicuspid Aortic Valve[Title/Abstract])) OR (Single Raphe Bicuspid Aortic Valve[Title/Abstract])) OR (Bicuspid Aortic Valve, Single Raphe[Title/Abstract])) OR (Purely Bicuspid Aortic Valve[Title/Abstract])) AND (((((((("Aortic Valve Stenosis"[Mesh]) OR (Aortic Valve Stenosis[Title/Abstract])) OR (Aortic Valve Stenoses[Title/Abstract])) OR (Stenoses, Aortic Valve[Title/Abstract])) OR (Stenosis, Aortic Valve[Title/Abstract])) OR (Valve Stenoses, Aortic[Title/Abstract])) OR (Valve Stenosis, Aortic[Title/Abstract])) OR (Aortic Stenosis[Title/Abstract])) OR (Stenoses, Aortic[Title/Abstract])) OR (Stenosis, Aortic[Title/Abstract]))	554
Web of Science	(TS=(Transcatheter Aortic Valve Replacement) OR AB=(Transcatheter Aortic Valve Replacement OR Transcatheter Aortic Valve Implantation)) AND (TS=(Bicuspid Aortic Valve Disease) OR AB=(Bicuspid	2159

	Aortic Valve Disease OR Bicuspid Aortic Valve OR Bicuspid Aortic Valves OR Valve, Bicuspid Aortic OR Aortic Valve, Bicuspid OR Aortic Valve Disease 1 OR Two-Raphe Bicuspid Aortic Valve OR Bicuspid Aortic Valve, Two-Raphe OR Bicuspid Aortic Valve, Two Raphe OR Double Raphe Bicuspid Aortic Valve OR Two Raphe Bicuspid Aortic Valve OR Single Raphe Bicuspid Aortic Valve OR Bicuspid Aortic Valve, Single Raphe OR Purely Bicuspid Aortic Valve)) AND (TS=(Aortic Valve Stenosis) OR AB=(Aortic Valve Stenosis OR Aortic Valve Stenoses OR Stenoses, Aortic Valve OR Stenosis, Aortic Valve OR Valve Stenoses, Aortic OR Valve Stenosis, Aortic OR Aortic Stenosis OR Stenoses, Aortic OR Stenosis, Aortic))	
Embase	#1 Transcatheter Aortic Valve Replacement OR Transcatheter Aortic Valve Implantation #2 Bicuspid Aortic Valve Disease OR Bicuspid Aortic Valve OR Bicuspid Aortic Valves OR Valve, Bicuspid Aortic OR Aortic Valve, Bicuspid OR Aortic Valve Disease 1 OR Two-Raphe Bicuspid Aortic Valve OR Bicuspid Aortic Valve, Two-Raphe OR Bicuspid Aortic Valve, Two Raphe OR Double Raphe Bicuspid Aortic Valve OR Two Raphe Bicuspid Aortic Valve OR Single Raphe Bicuspid Aortic Valve OR Bicuspid Aortic Valve, Single Raphe OR Purely Bicuspid Aortic Valve #3 Aortic Valve Stenosis OR Aortic Valve Stenoses OR Stenoses, Aortic Valve OR Stenosis, Aortic Valve OR Valve Stenoses, Aortic OR Valve Stenosis, Aortic OR Aortic Stenosis OR Stenoses, Aortic OR Stenosis, Aortic #1 AND #2 AND #3	452
Cochrane library	#1 Bicuspid Aortic Valve Disease or Bicuspid Aortic Valve, Two Raphe or Bicuspid Aortic Valve, Two-Raphe or Two-Raphe Bicuspid Aortic Valve or Double Raphe Bicuspid Aortic Valve or Two Raphe Bicuspid Aortic Valve or Single Raphe Bicuspid Aortic Valve or Bicuspid Aortic Valve, Single Raphe or	321

Purely Bicuspid Aortic Valve or Bicuspid Aortic Valve
or Bicuspid Aortic Valves or Aortic Valve, Bicuspid or
Valve, Bicuspid Aortic or Aortic Valve Disease

#2

Aortic Valve Stenosis or Stenoses, Aortic Valve or
Valve Stenosis, Aortic or Stenosis, Aortic Valve or
Stenoses, Aortic or Stenosis, Aortic or Aortic Valve
Stenoses or Valve Stenoses, Aortic or Aortic Stenosis

#3

Transcatheter Aortic Valve Replacement or
Transcatheter Aortic Valve Implantation

#1 and #2 and #3

Supplementary Table 1

Supplementary Table 1. Baseline characteristics of the included patients. Statistically significant differences were marked with an asterisk (*).

Baseline variable	BAV	TAV	P value
Age (years, mean $\pm$ SD) *	71.2 $\pm$ 9.2 (14692)	73.2 $\pm$ 10 (177999)	<0.001
Men (%) *	61.3(9009/14689)	53.3(94930/177963)	<0.001
STS score (% , mean $\pm$ SD) *	3.5 $\pm$ 3.0(7627)	4.3 $\pm$ 3.5(9217)	0.048
BMI (kg/m2, mean $\pm$ SD)	28.9 $\pm$ 6.9(7087)	28.5 $\pm$ 6.2(9498)	0.11
Hypertension (%) *	78.1(7155/9156)	80.8 (9964/12336)	0.016
Diabetes (%)	29.5(2702/9166)	30.7(3790/12331)	0.307
CAD (%) *	47.6(2915/6127)	61.4(102950/167730)	<0.001
COPD (%)	22.5(197/876)	25.4(851/3346)	0.088
CKD (%) *	26.9(205/762)	34.6(658/1903)	<0.001
NYHA classification (III/IV) (%) *	70.2(9774/13930)	76.2(132759/174114)	0.02
prior PCI (%) *	19.3(537/2789)	25(1032/4123)	0.017
Prior MI (%) *	4.9(64/1298)	12.9(378/2941)	<0.001

BAV=bicuspid aortic valve; TAV=tricuspid aortic valve; STS=society of thoracic surgeons; BMI=Body mass index; CAD= coronary artery disease; COPD= chronic obstructive pulmonary disease; CKD=chronic kidney disease; PCI=percutaneous coronary intervention.

Supplementary Table 2

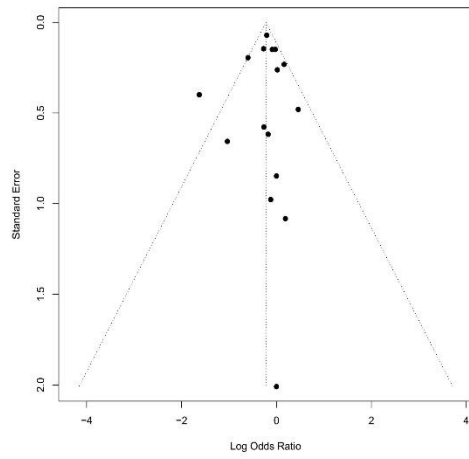
Supplementary Table 2. Device success rates and corresponding VARC definitions across included studies.

Author	Year	Device success-BAV	Total- BAV	Device success-TAV	Total-TAV	VARC version
Costopoulos, C.	2014	18	21	422	447	VARC1
Dai, H.	2023	174	211	157	191	VARC2
Fu, B.	2020	38	44	66	74	VARC2
Kawamori, H.	2018	40	41	232	239	VARC2
Kochman, J.	2014	26	28	78	84	VARC1
Magyari, B.	2024	52	52	52	52	VARC2
Makkar, R.R.	2019	2577	2671	2586	2678	VARC2
Makkar, R.R.	2021	3044	3156	3066	3152	NA
De Biase, C.	2018	61	83	155	166	NA
Forrest, J.K.	2020	893	929	887	929	VARC1
Kim, W.K.	2021	105	242	331	726	NA
Liu, X.B.	2015	13	15	22	25	VARC1
Michel, J.M.	2021	73	78	600	665	NA
Yoon, S.H.	2017	466	546	499	546	NA
Deeb, G.M.	2022	137	143	136	141	VARC1
Halim, S. A.	2020	5146	5361	158959	164369	NA

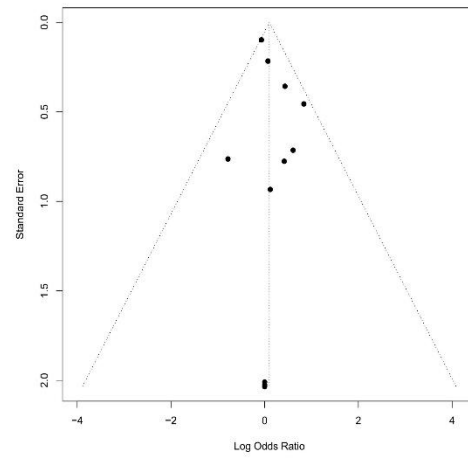
BAV=bicuspid aortic valve; TAV=tricuspid aortic valve; VARC: Valve Academic Research Consortium; NA=not available.

Supplementary Figure 1

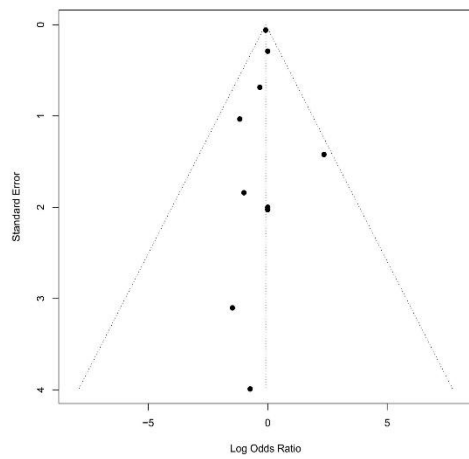
Supplementary Figure 1. Funnel plots for primary and secondary endpoints.



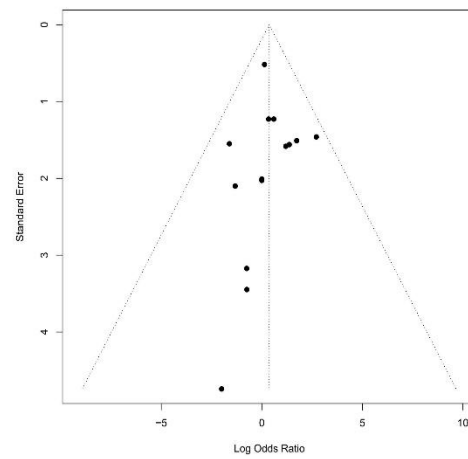
(A) Device success



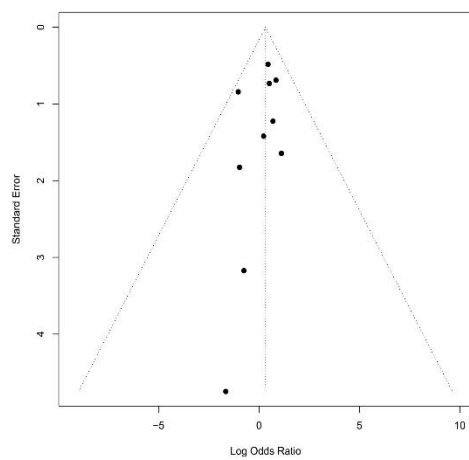
(B) In-hospital mortality



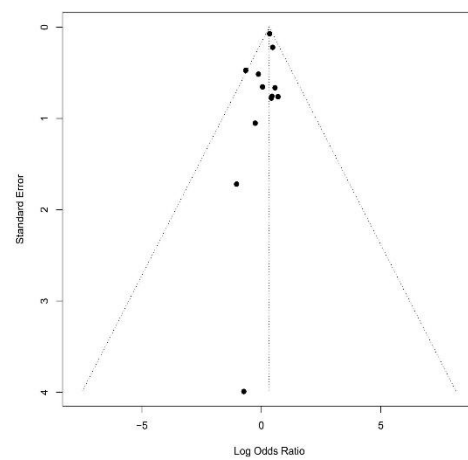
(C) Bleeding life-threatening



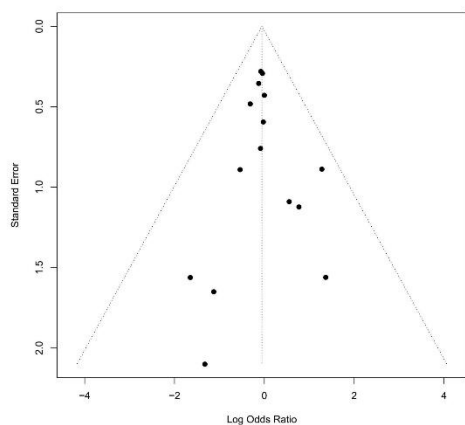
(D) Myocardial infarction



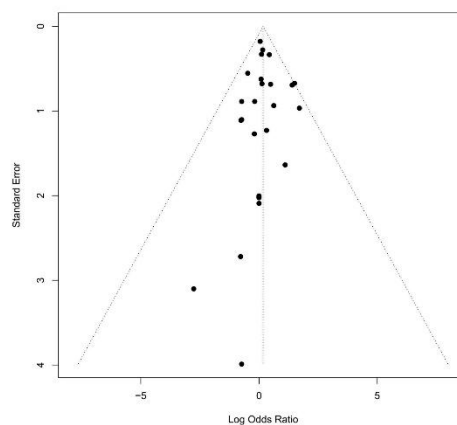
(E) Coronary obstruction



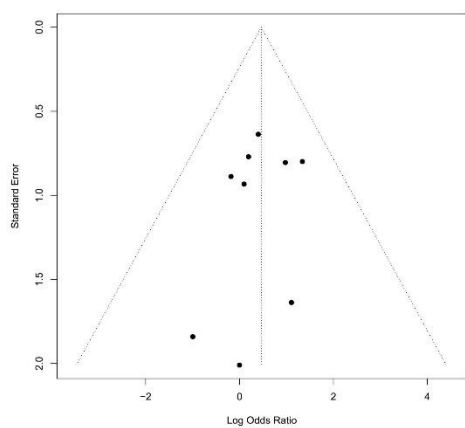
(F) Moderate or severe PVL



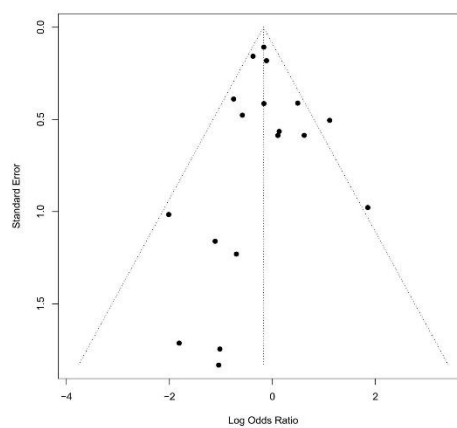
(G) Major vascular complications



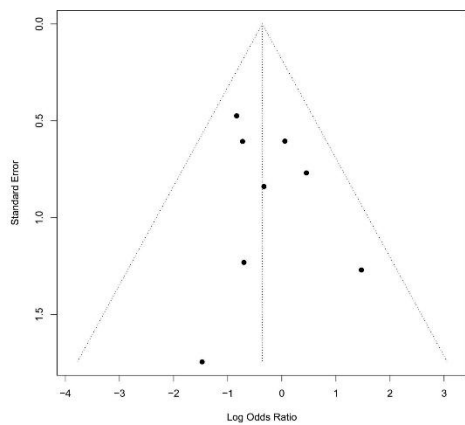
(H) 30-day All-cause mortality



(I) 30-day Cardiovascular mortality



(J) 1-year All-cause mortality

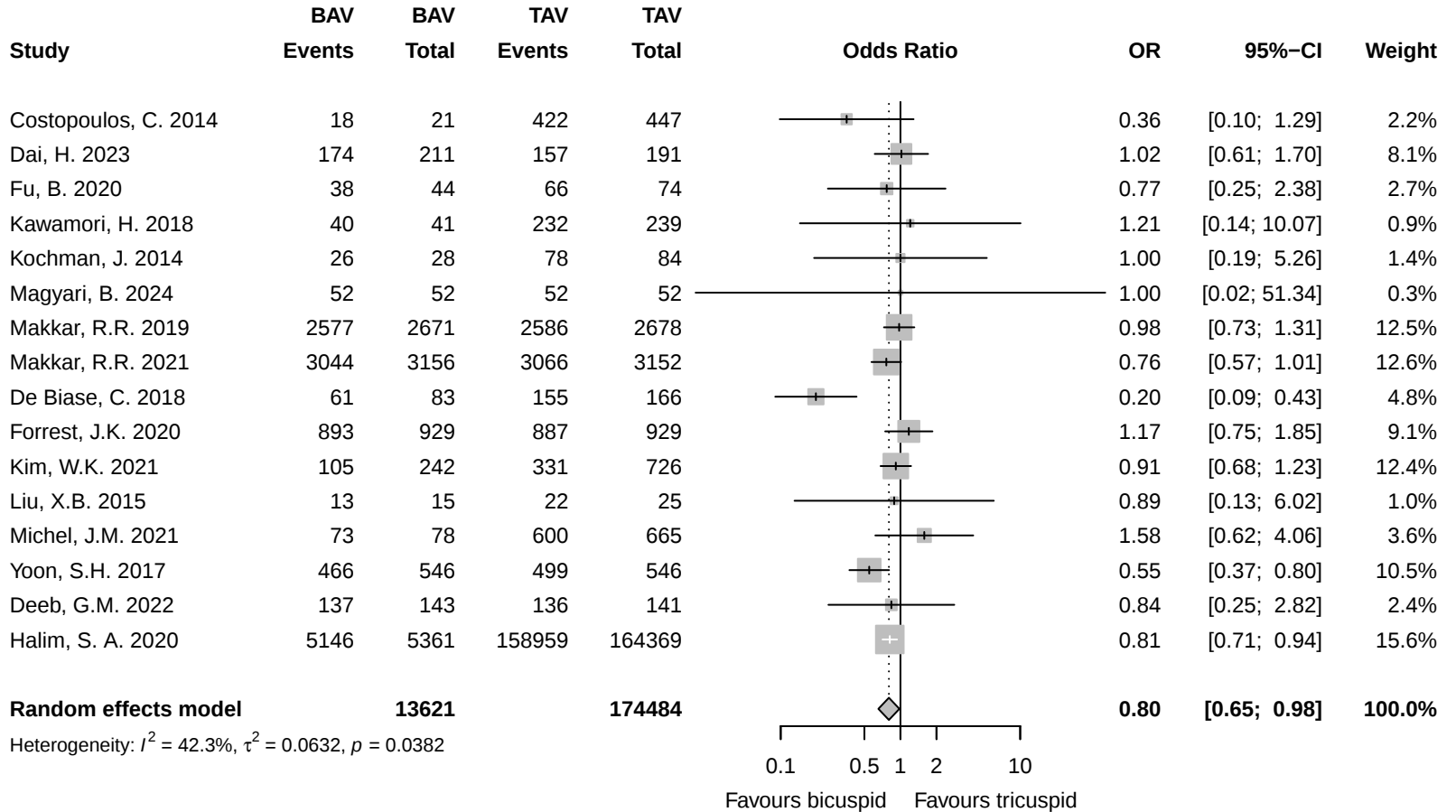


(K) 1-year Cardiovascular mortality

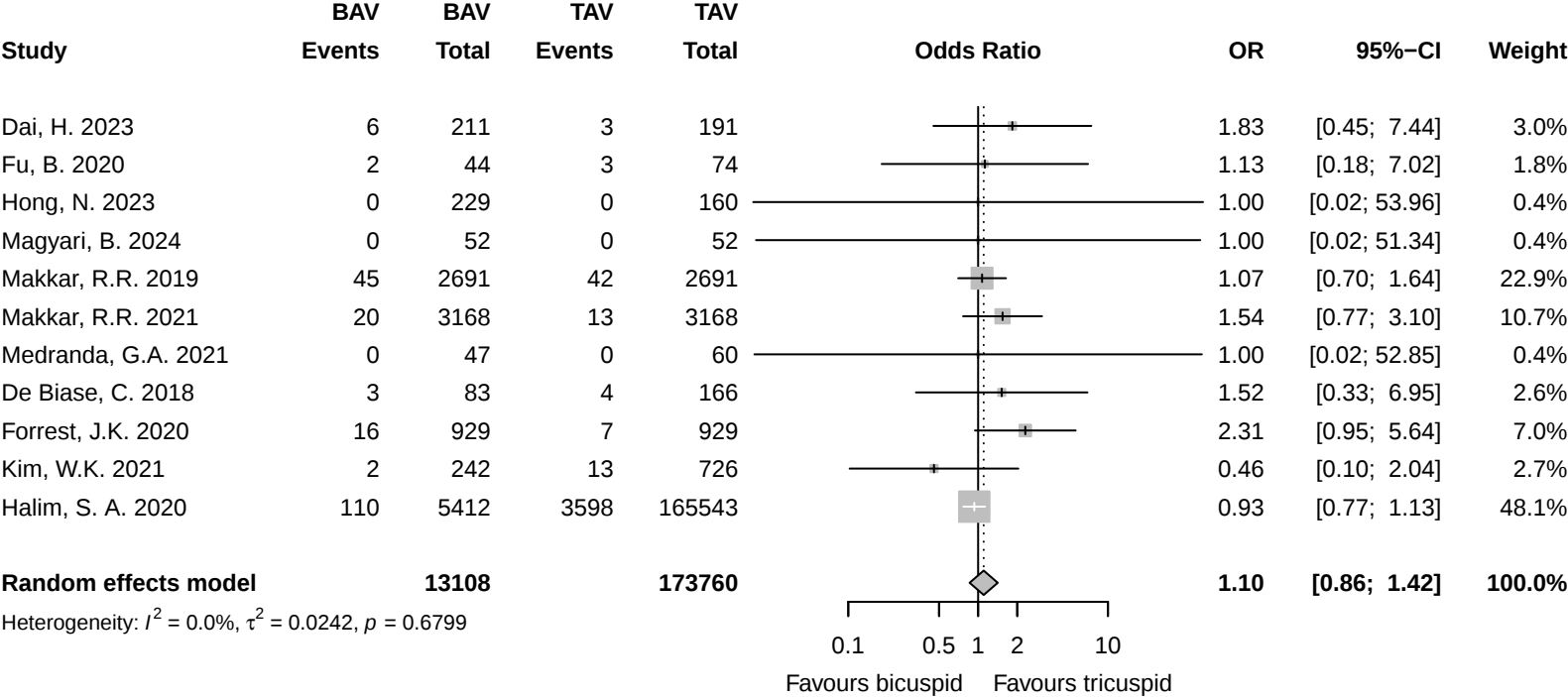
Supplementary Figure 2

Supplementary Figure 2. Forest plots for primary and secondary endpoints.

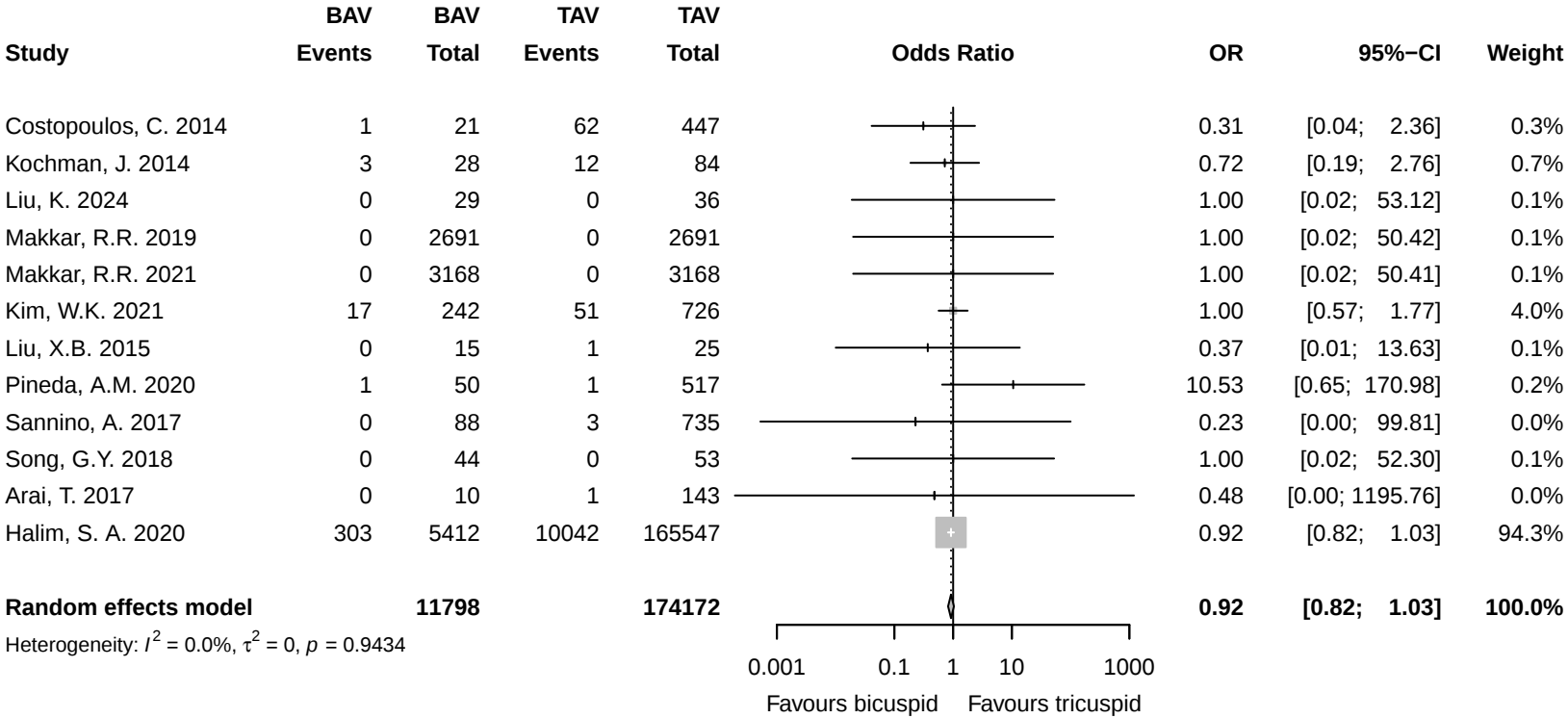
(A) Forest Plot for Device success OR



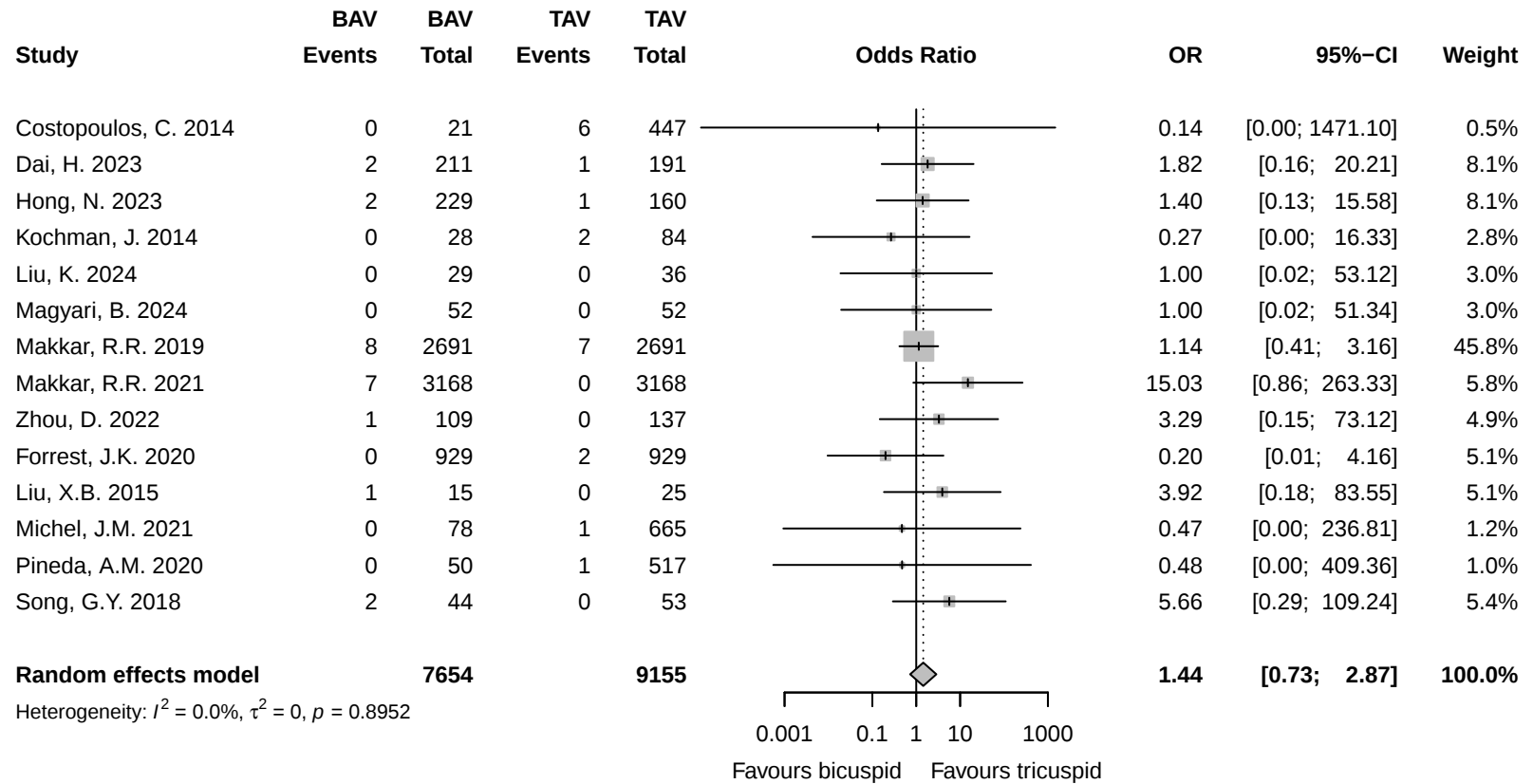
(B) Forest Plot for In-hospital mortality OR



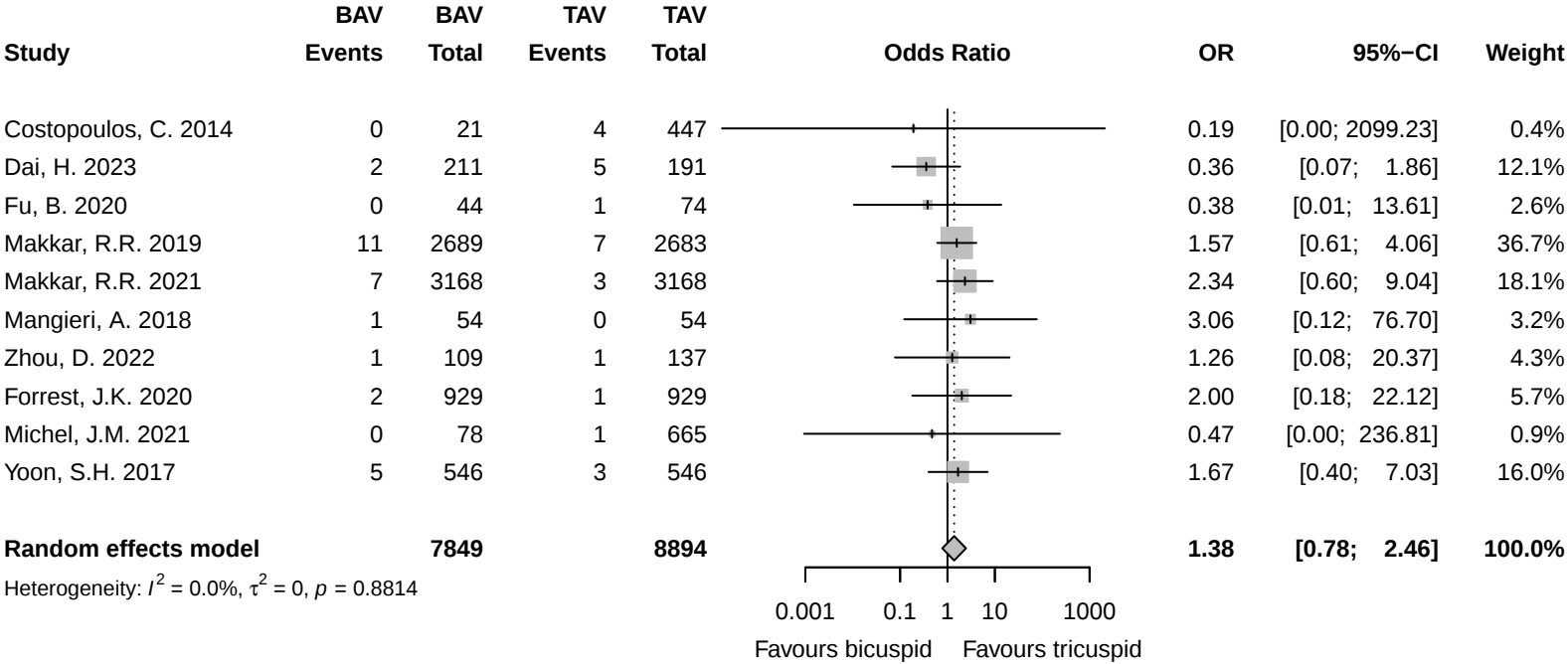
(C) Forest Plot for Bleeding life-threatening OR



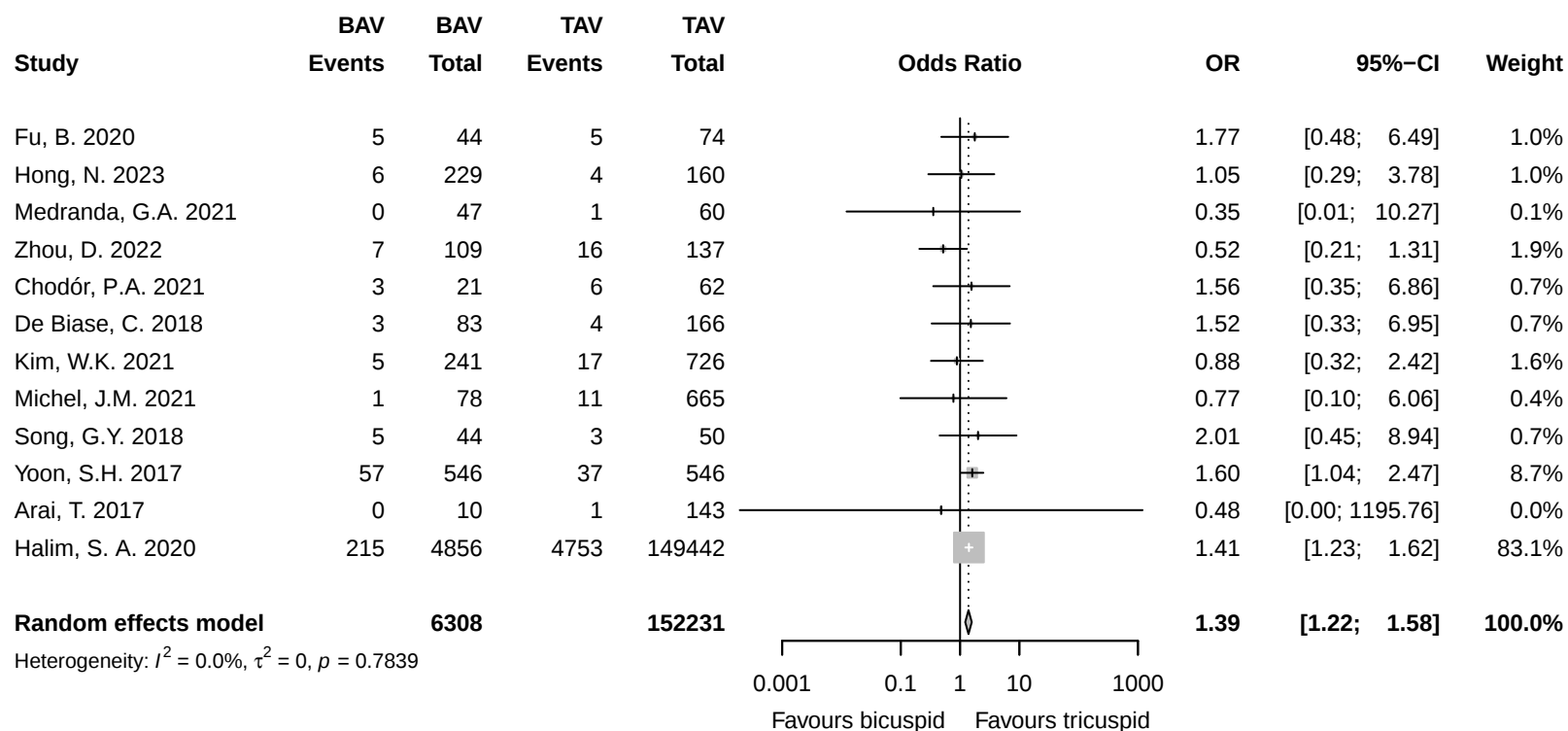
(D) Forest Plot for Myocardial infarction OR



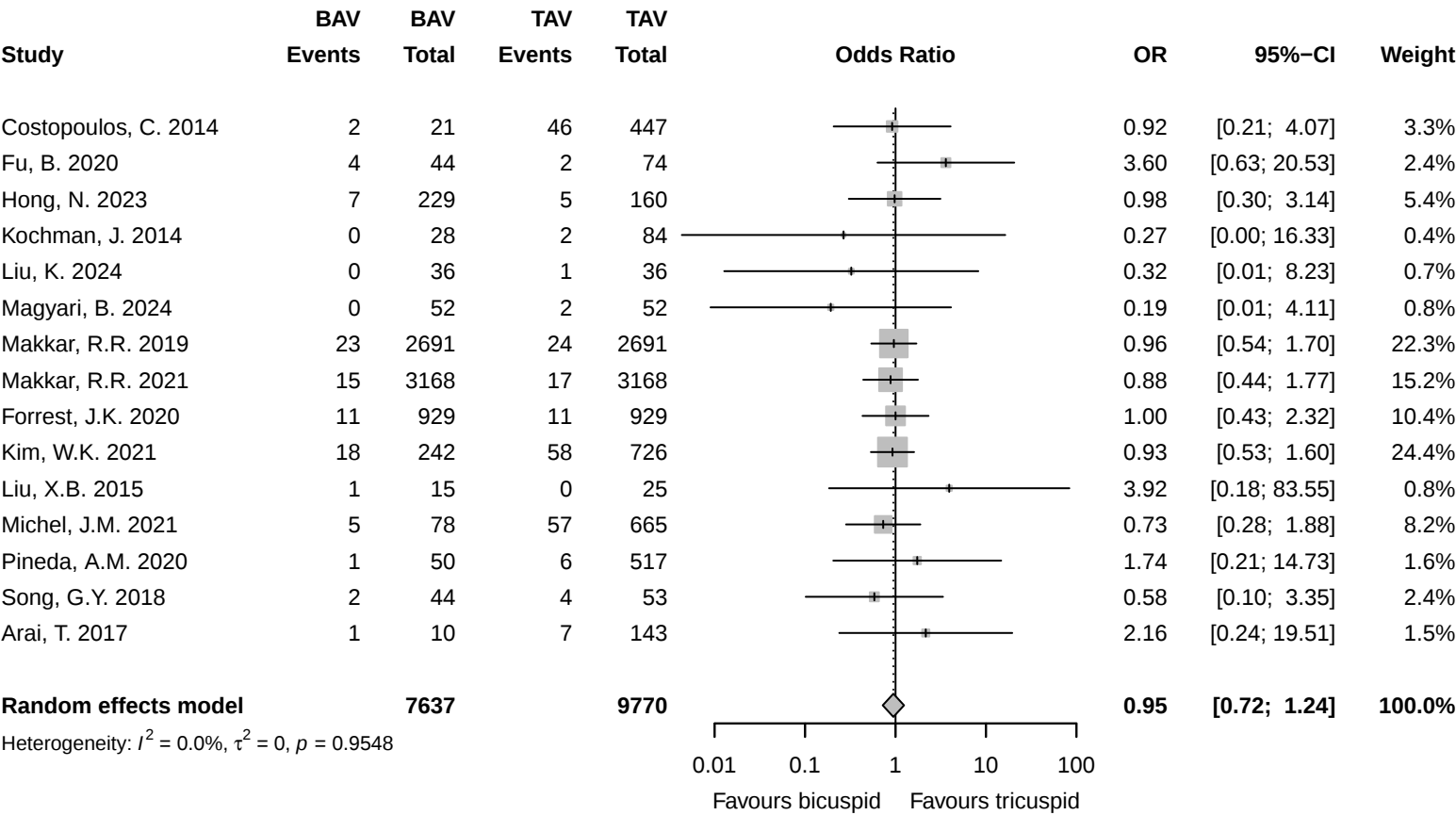
(E) Forest Plot for Coronary obstruction OR



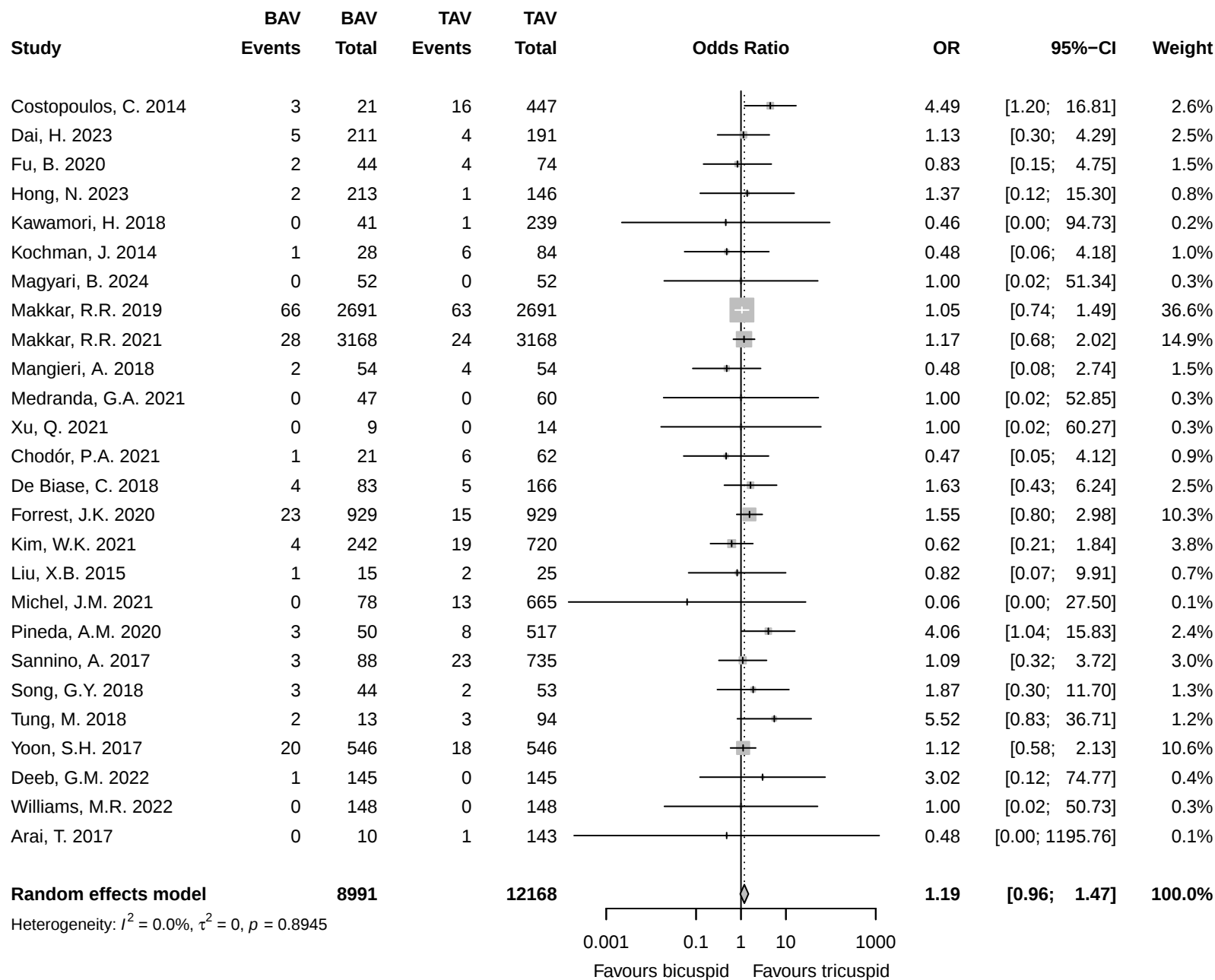
(F) Forest Plot for Moderate/severe PVL OR



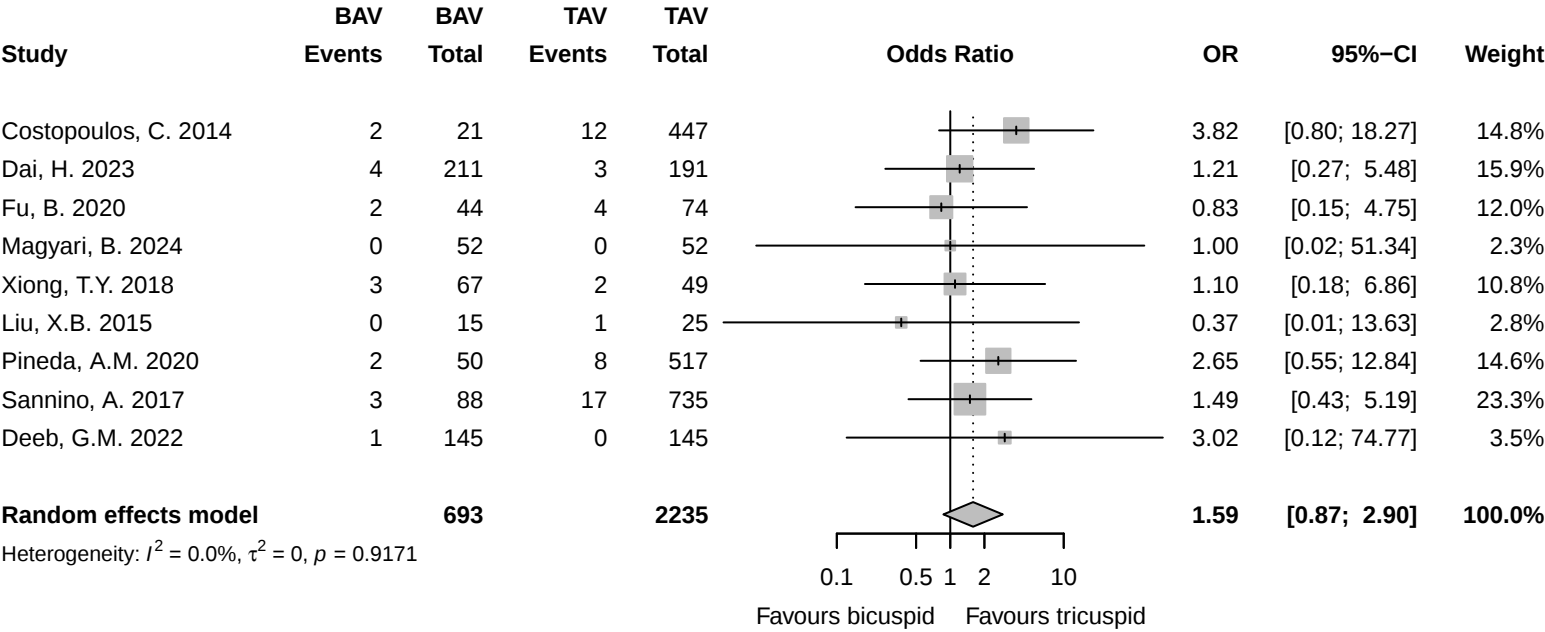
(G) Forest Plot for Major vascular complications OR



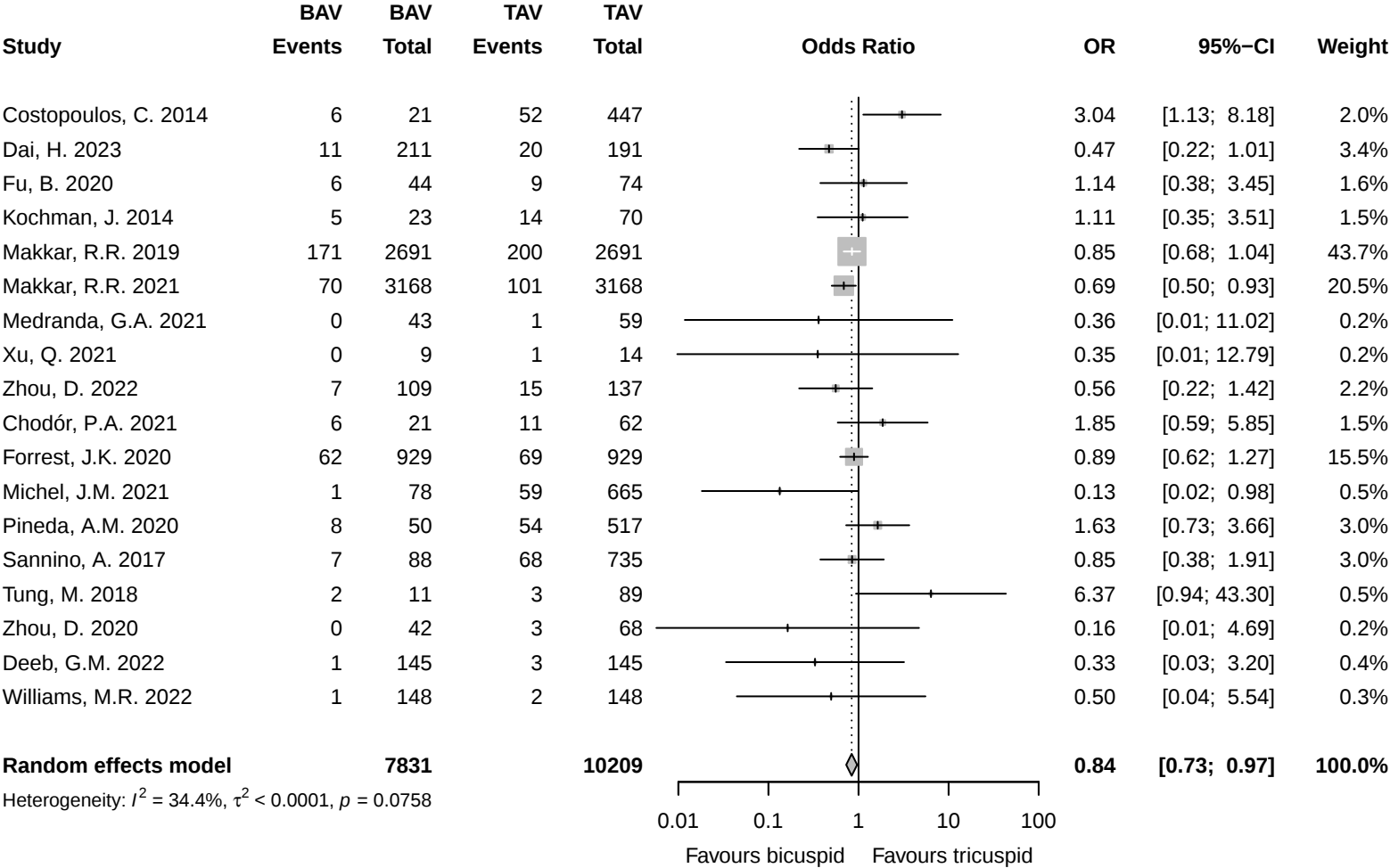
(H) Forest Plot for 30-day All-cause mortality OR



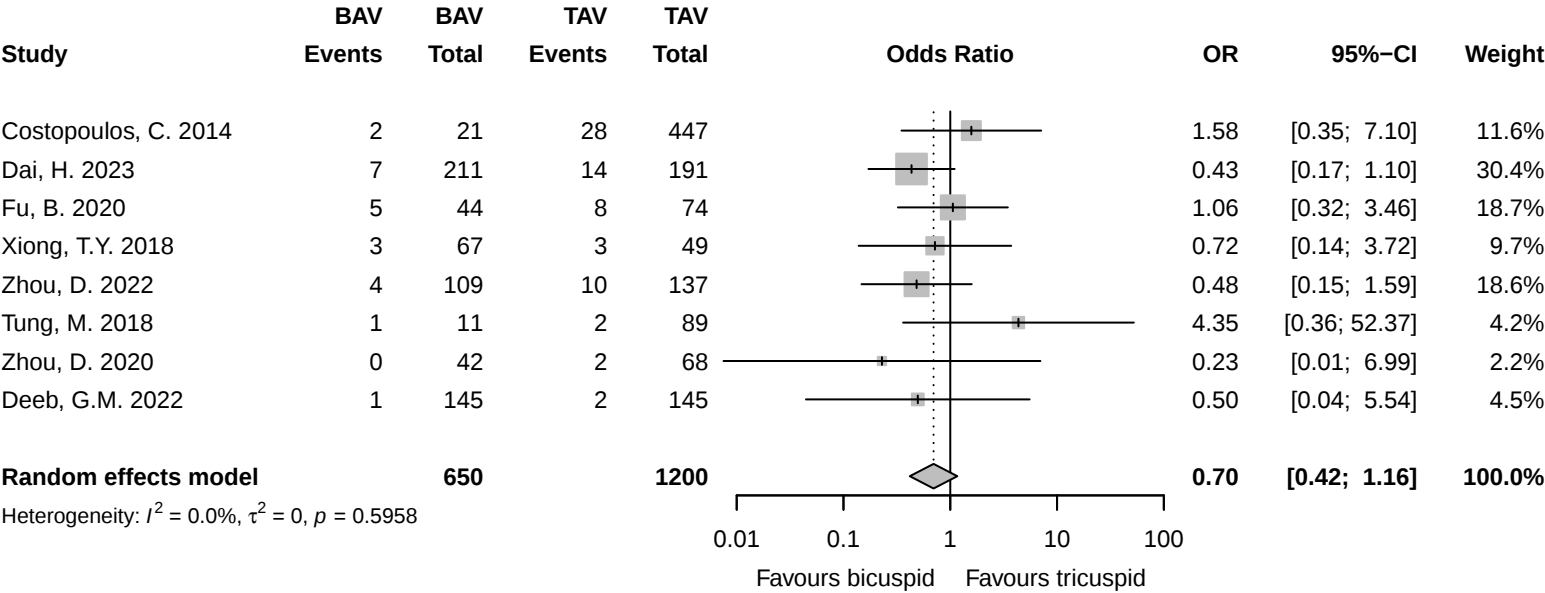
(I) Forest Plot for 30-day Cardiovascular mortality OR



(J) Forest Plot for 1-year All-cause mortality OR



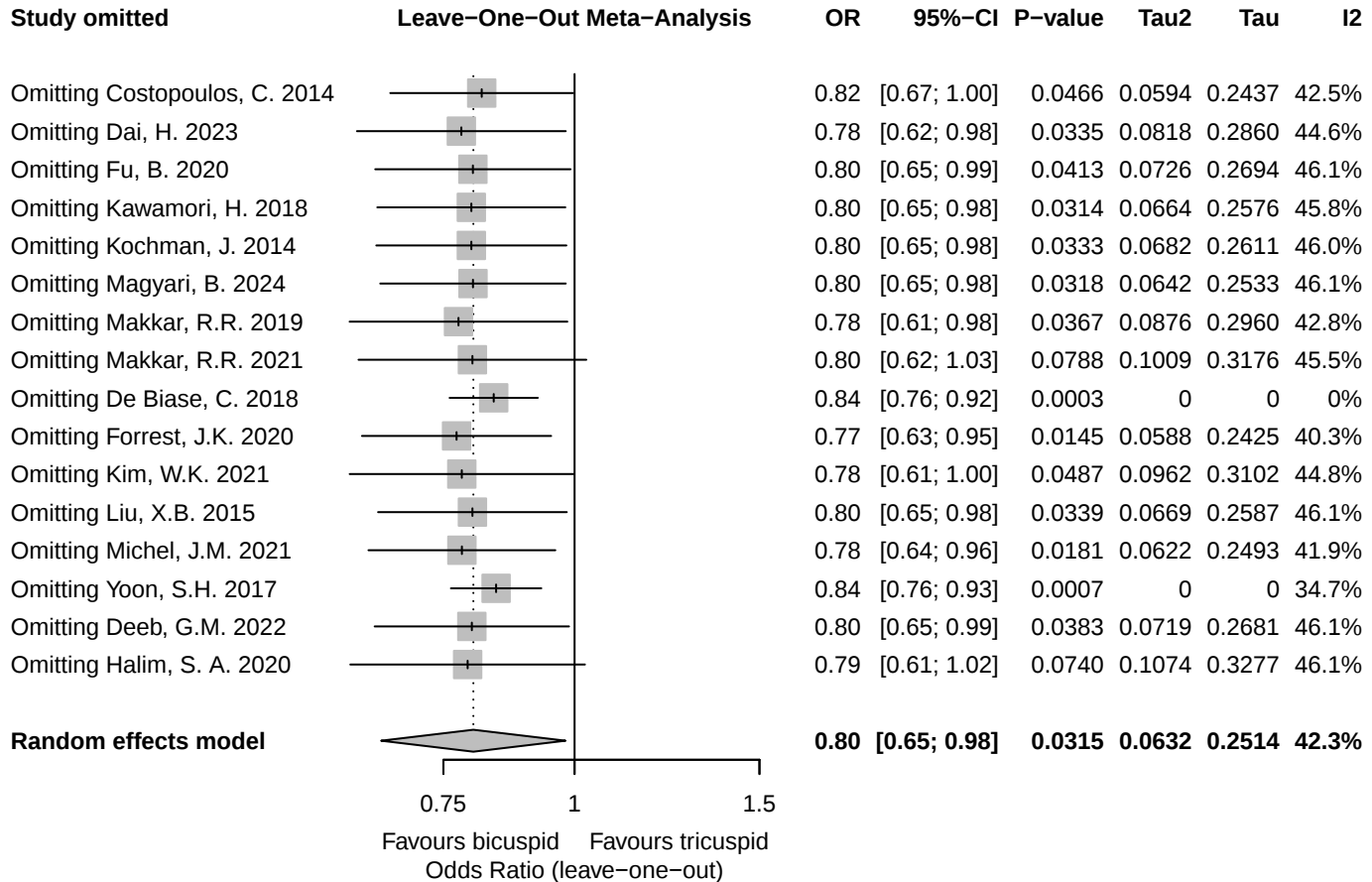
(K) Forest Plot for 1-year Cardiovascular mortality OR



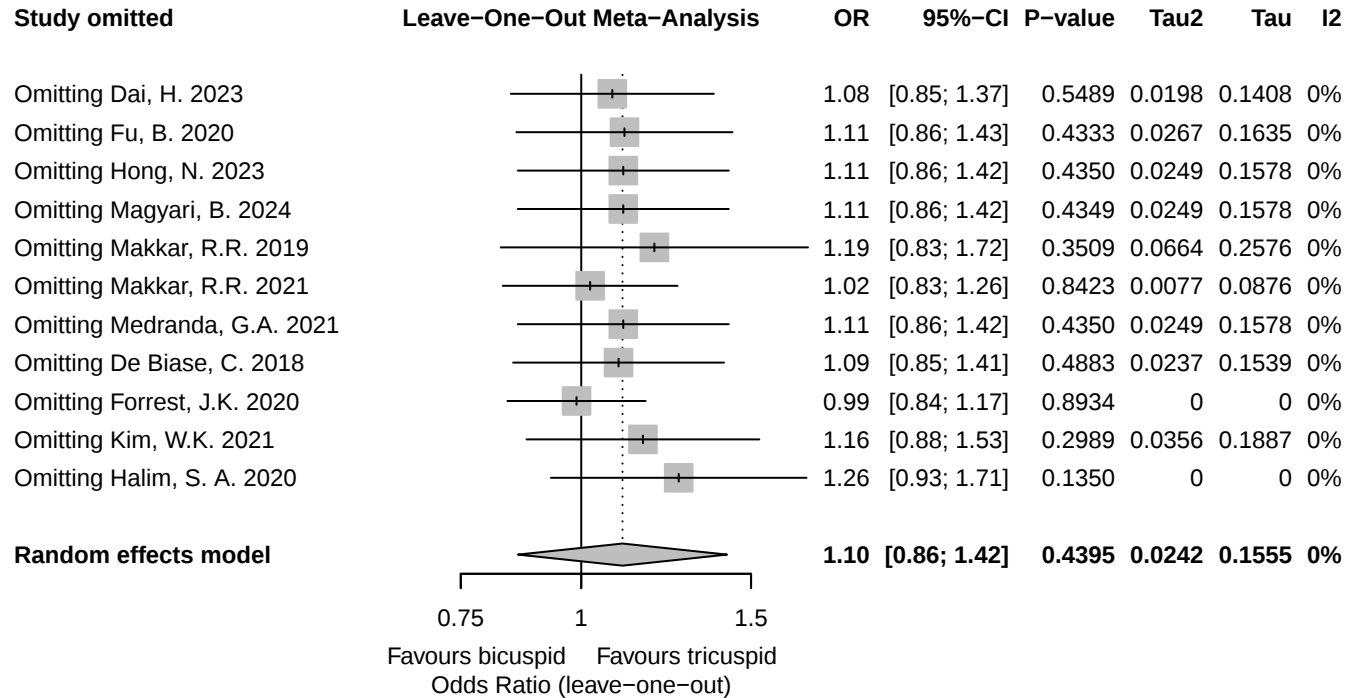
Supplementary Figure 3

Supplementary Figure 3. Sensitivity analyses for primary and secondary endpoints: 'leave-one-out'.

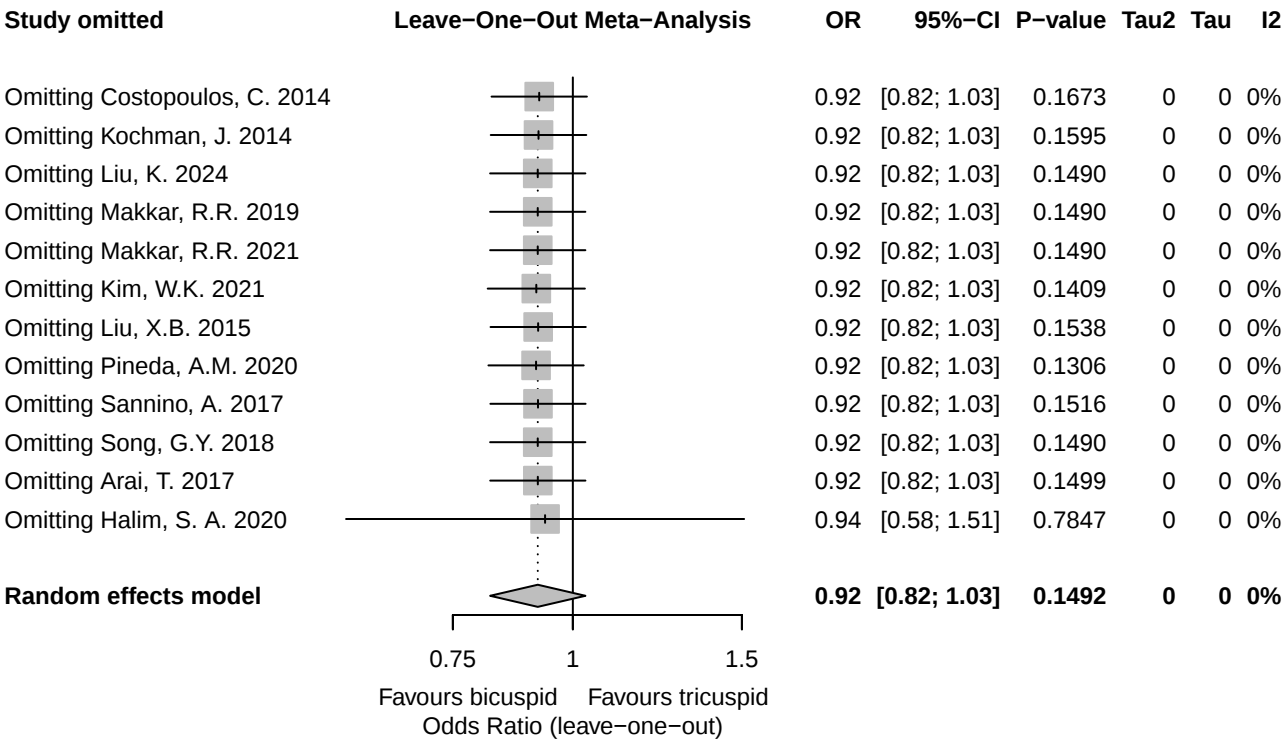
(A) Sensitivity Analysis for Device success



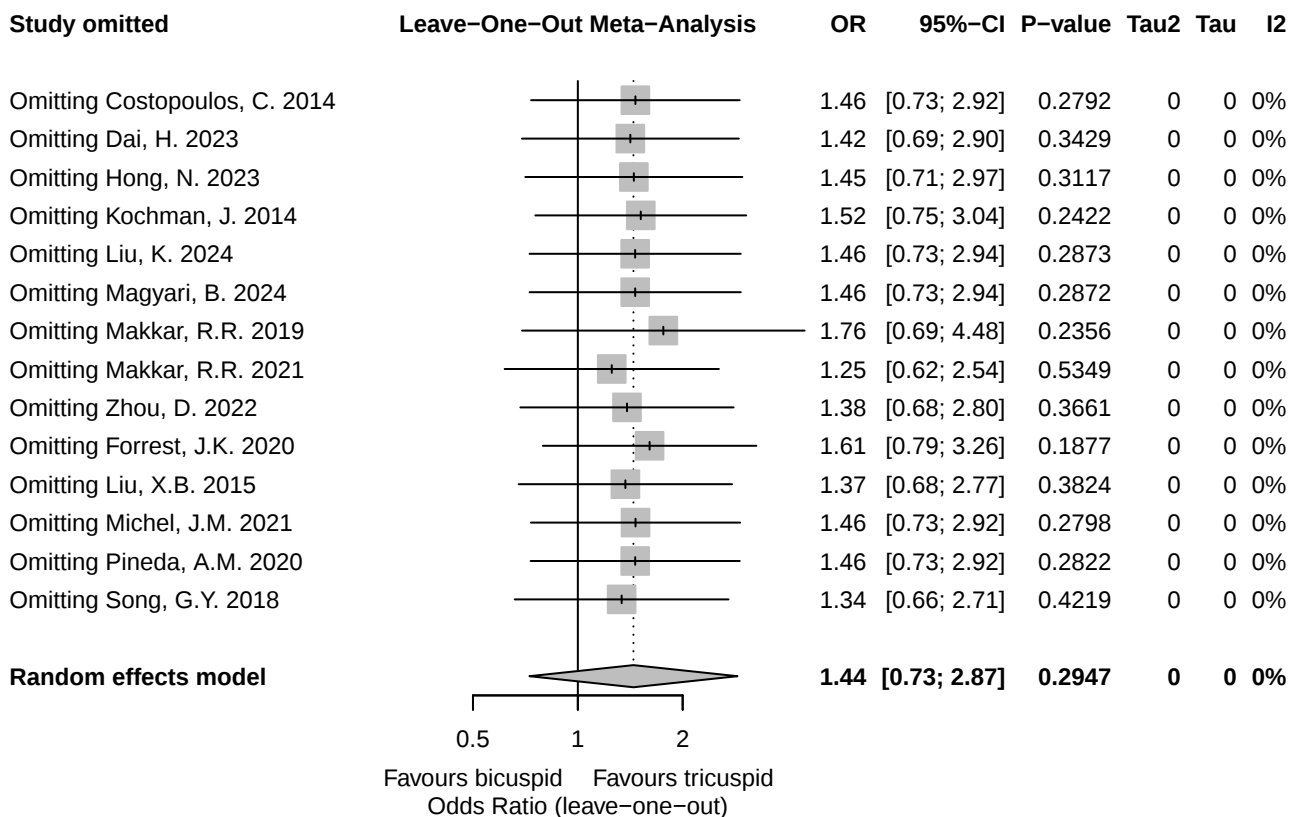
(B) Sensitivity Analysis for In-hospital mortality



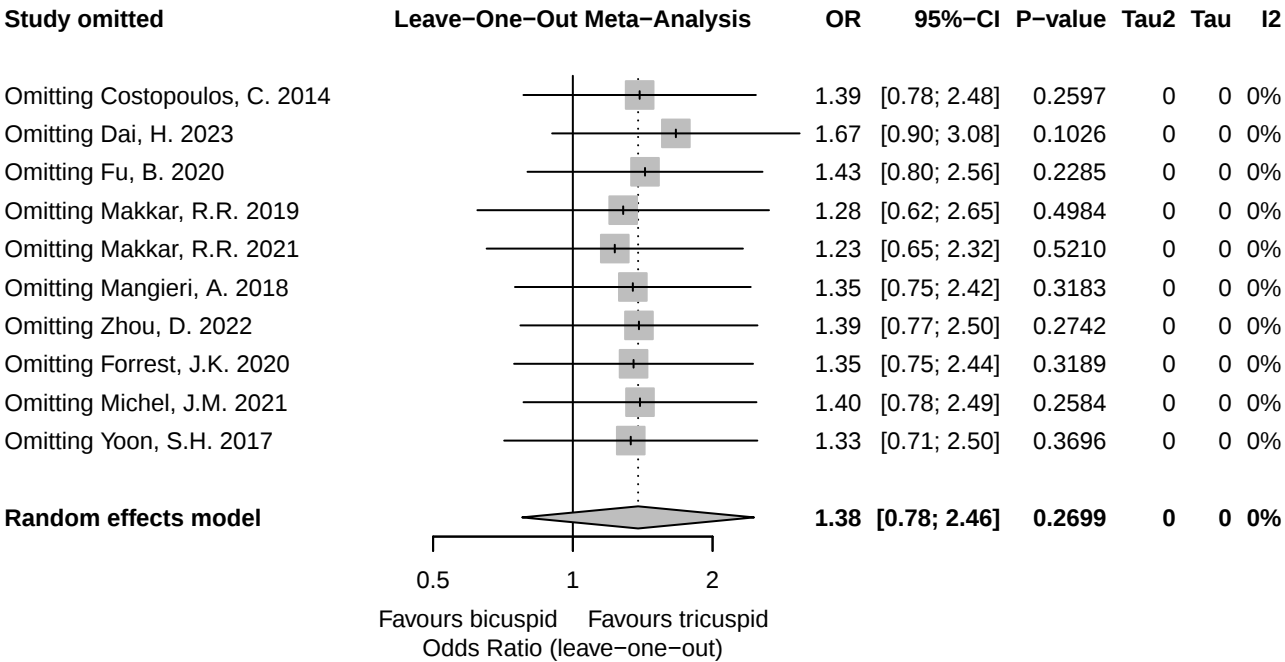
(C) Sensitivity Analysis for Bleeding life-threatening



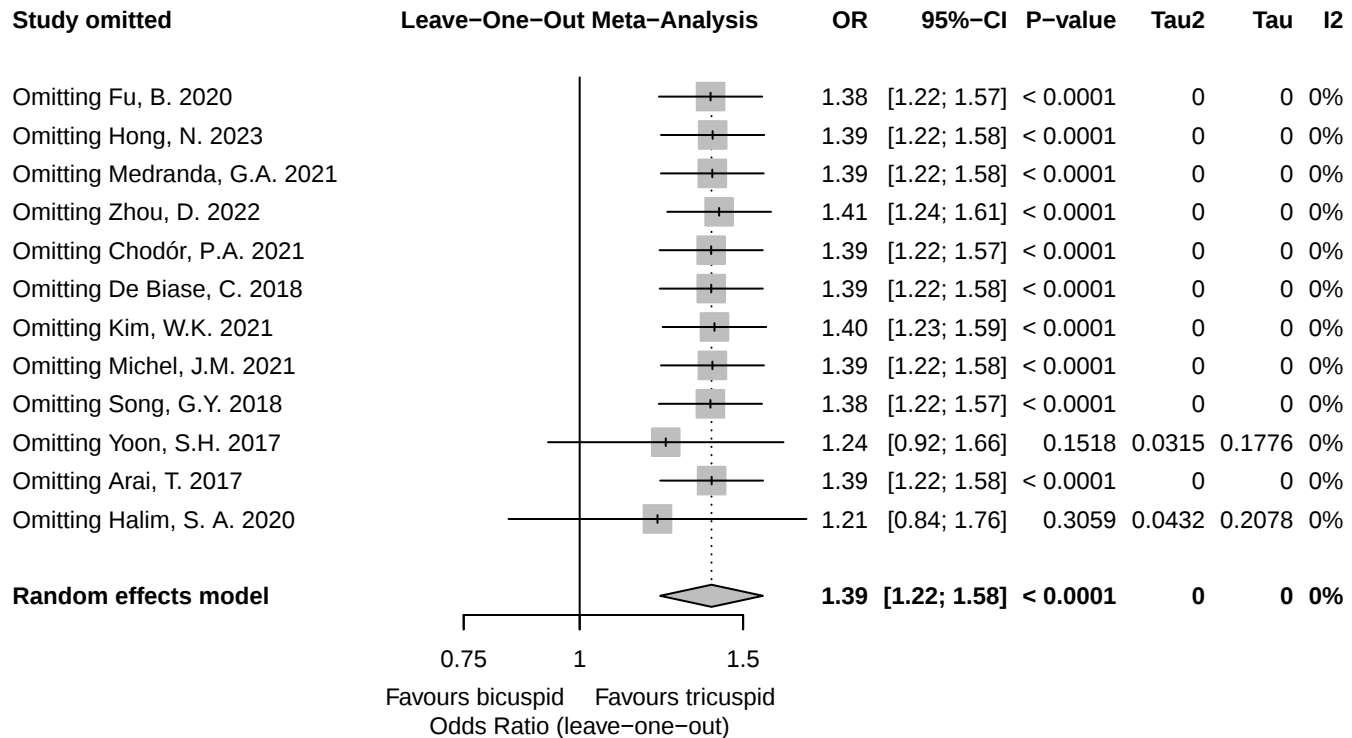
(D) Sensitivity Analysis for Myocardial infarction



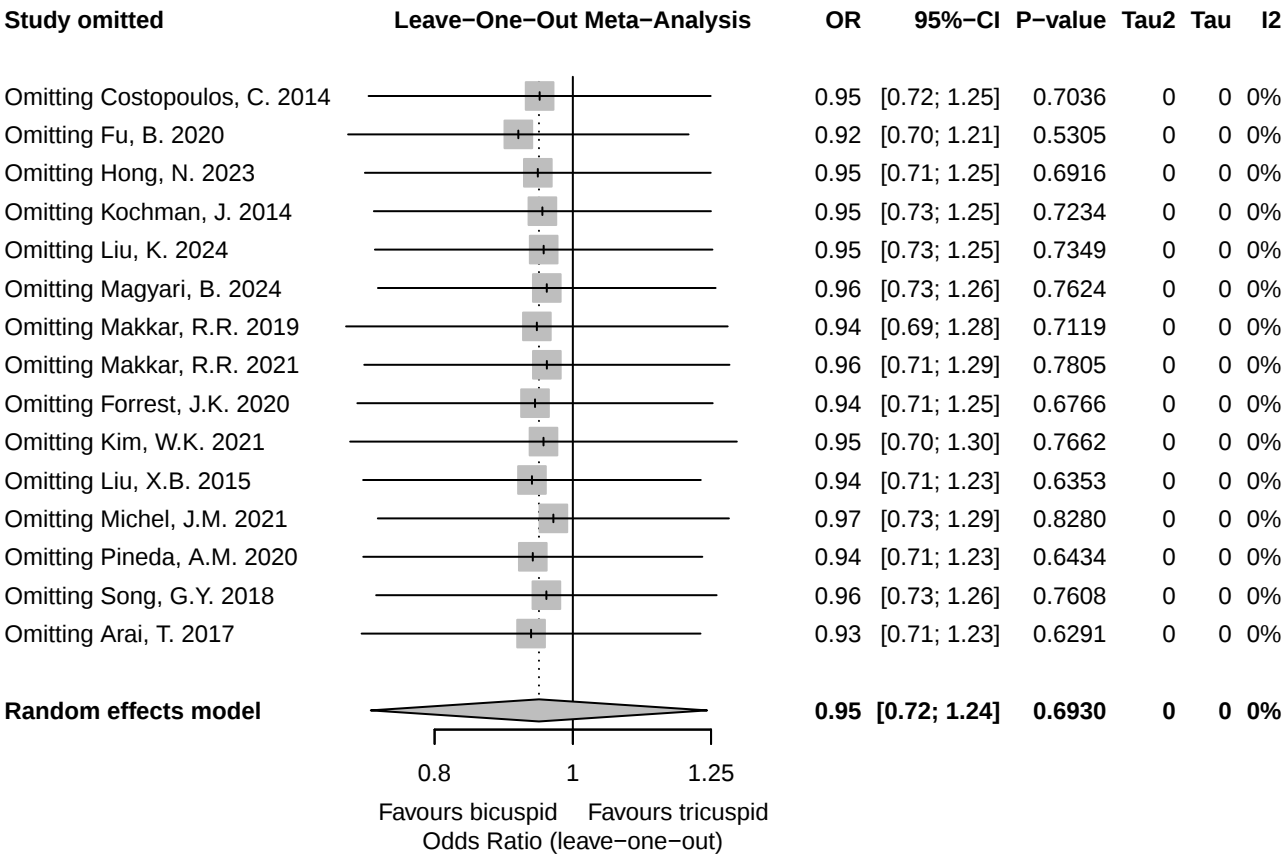
(E) Sensitivity Analysis for Coronary obstruction



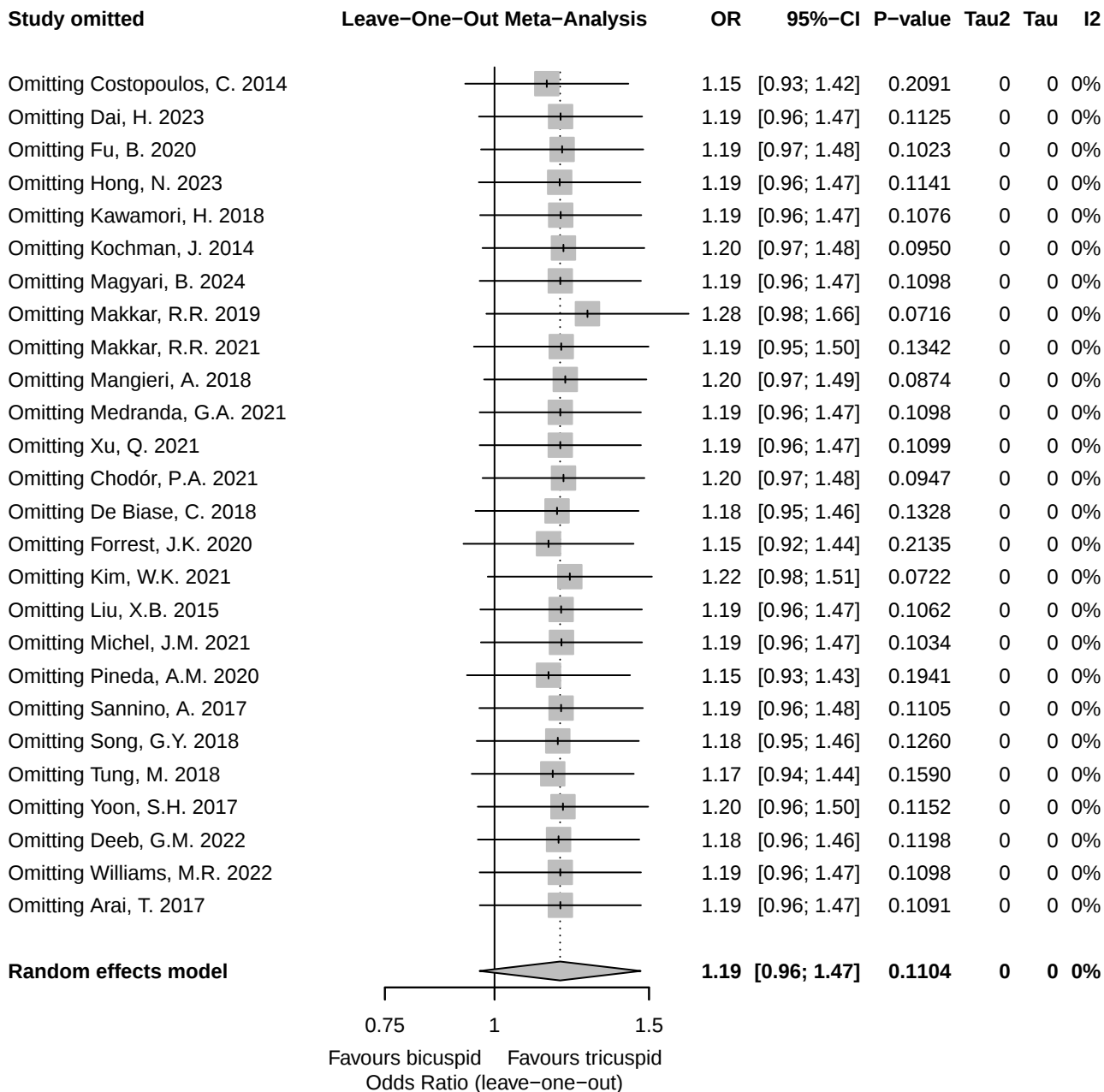
(F) Sensitivity Analysis for Moderate/severe PVL



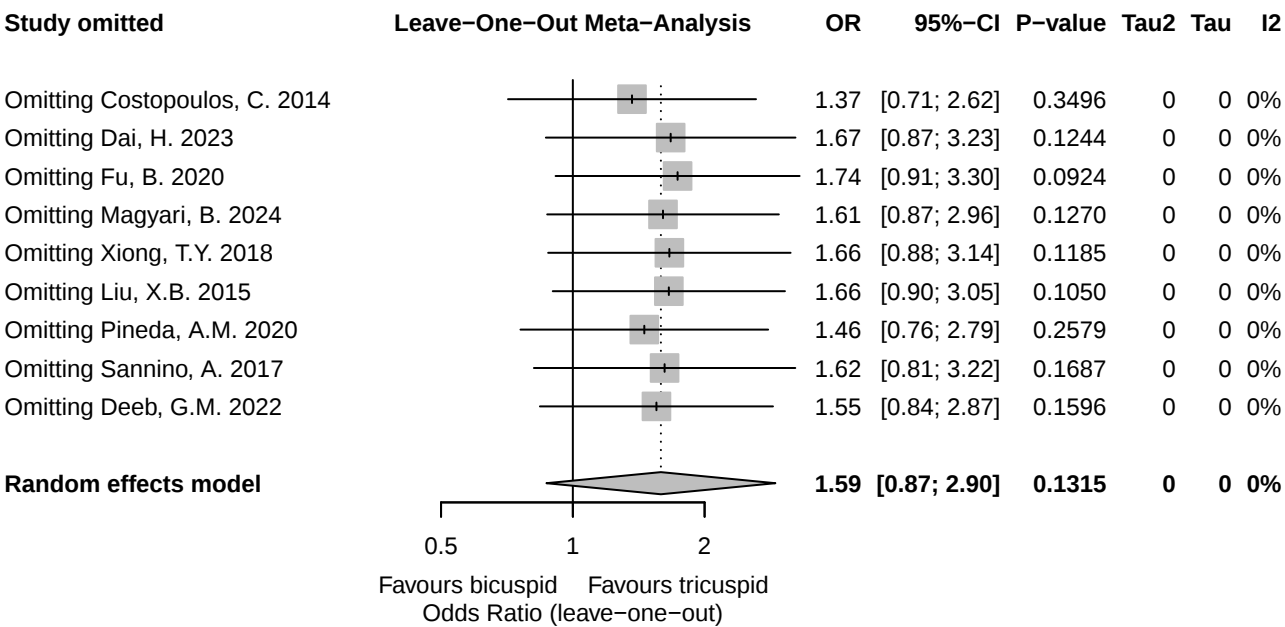
(G) Sensitivity Analysis for Major vascular complications



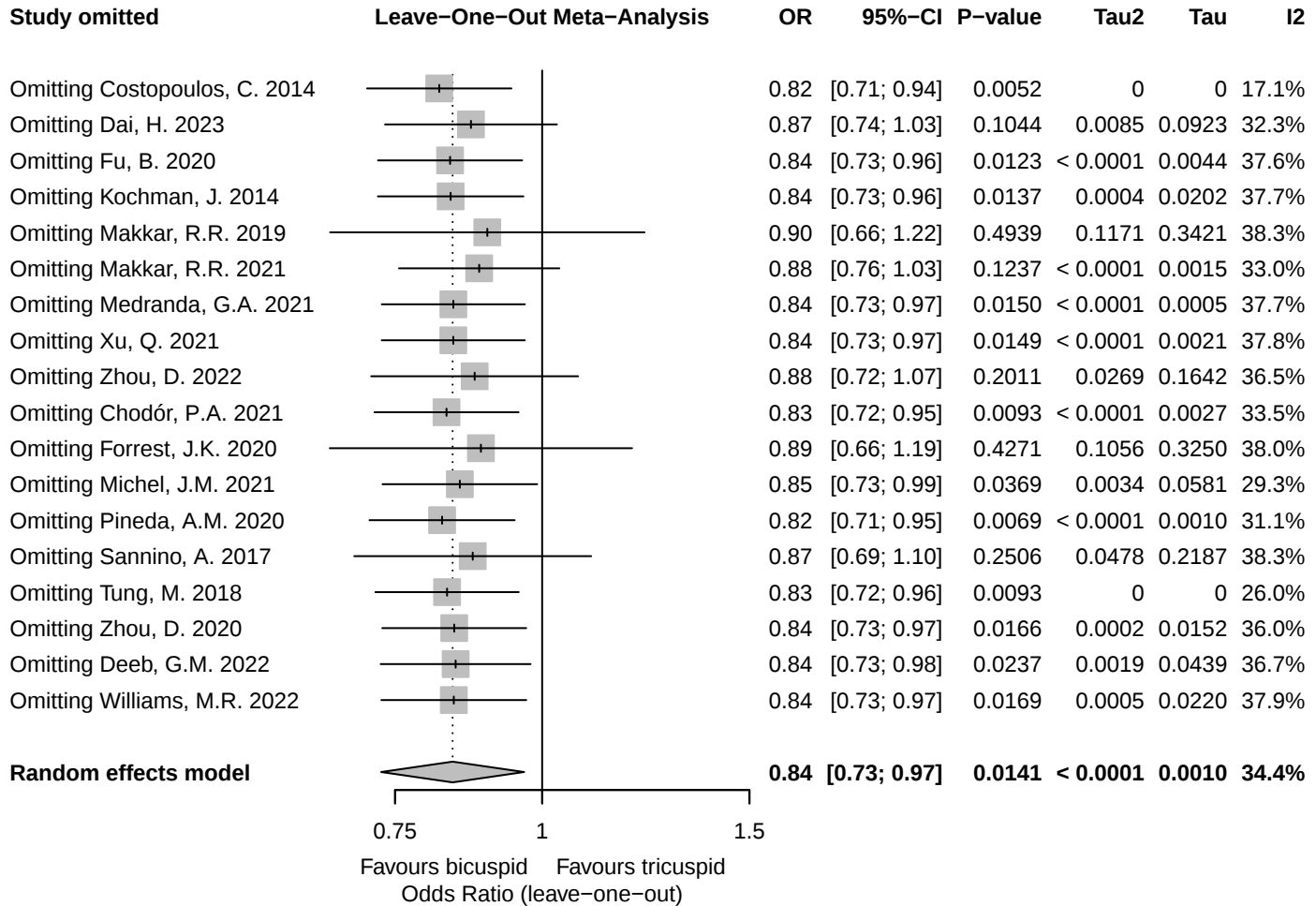
(H) Sensitivity Analysis for 30-day All-cause mortality



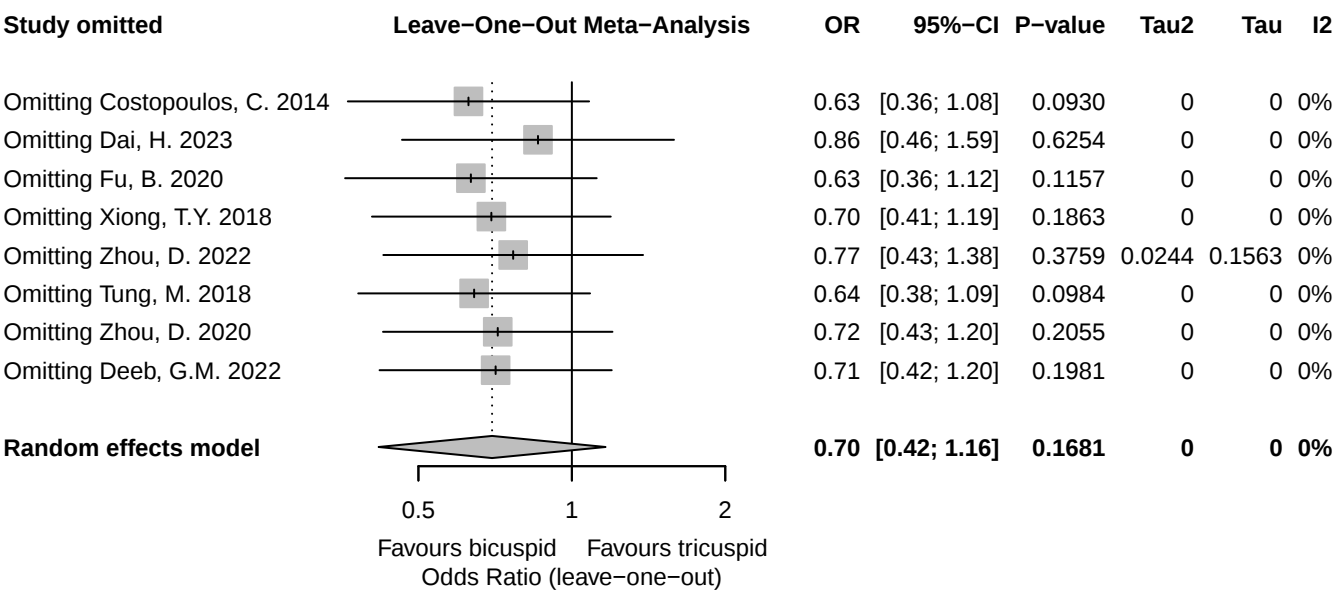
(I) Sensitivity Analysis for 30-day Cardiovascular mortality



(J) Sensitivity Analysis for 1year All-cause mortality



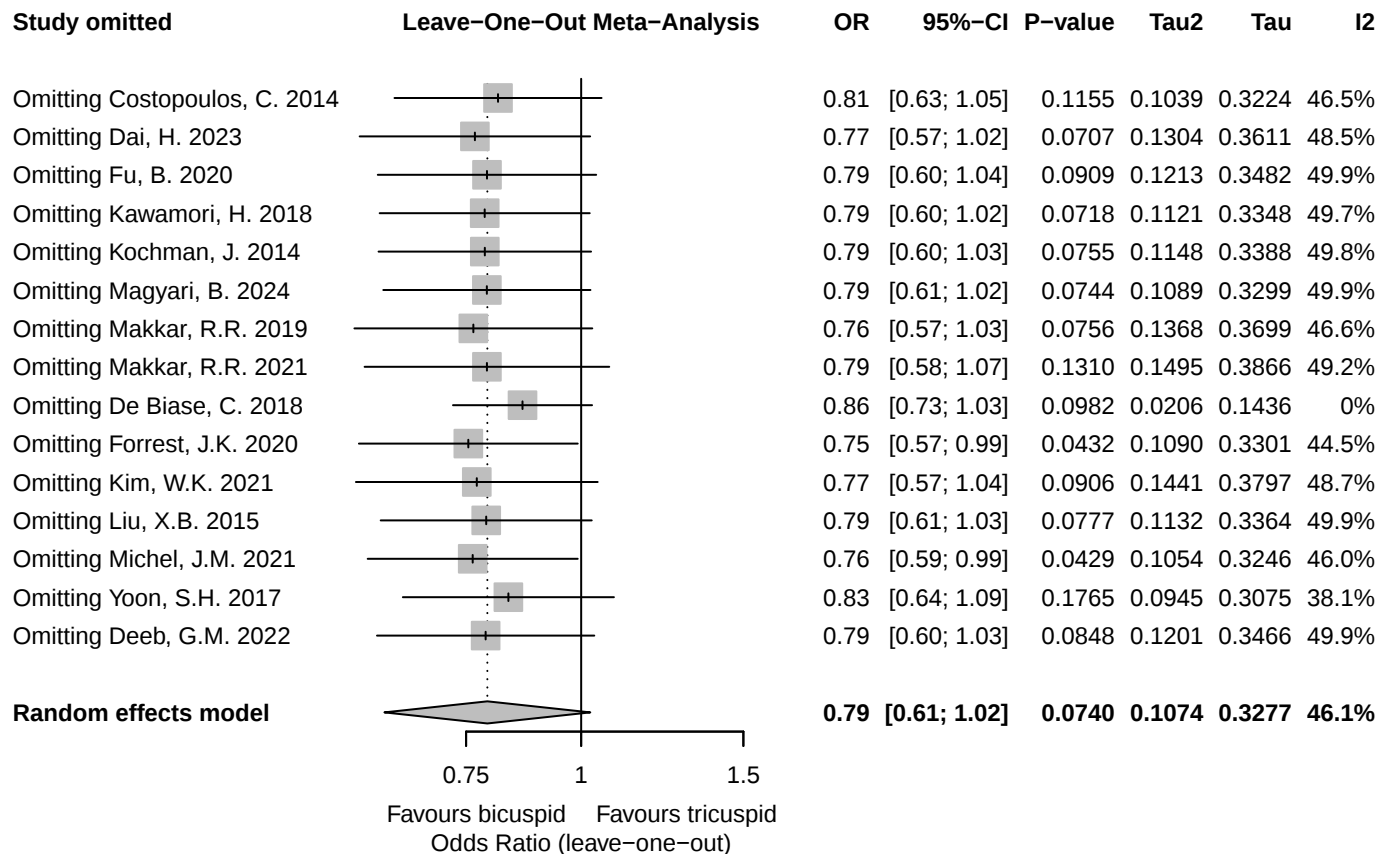
(K) Sensitivity Analysis for 1year Cardiovascular mortality



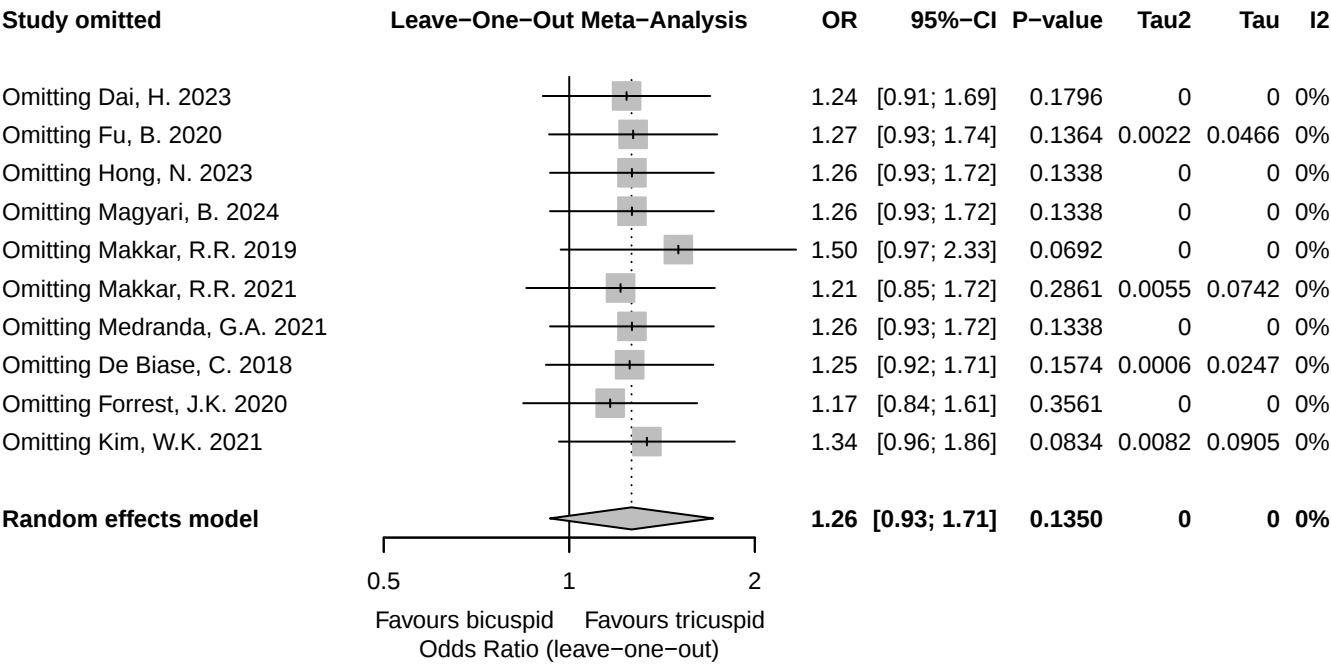
Supplementary Figure 4

Supplementary Figure 4. Sensitivity analyses of clinical endpoints excluding studies with a Newcastle-Ottawa Scale (NOS) score <7.

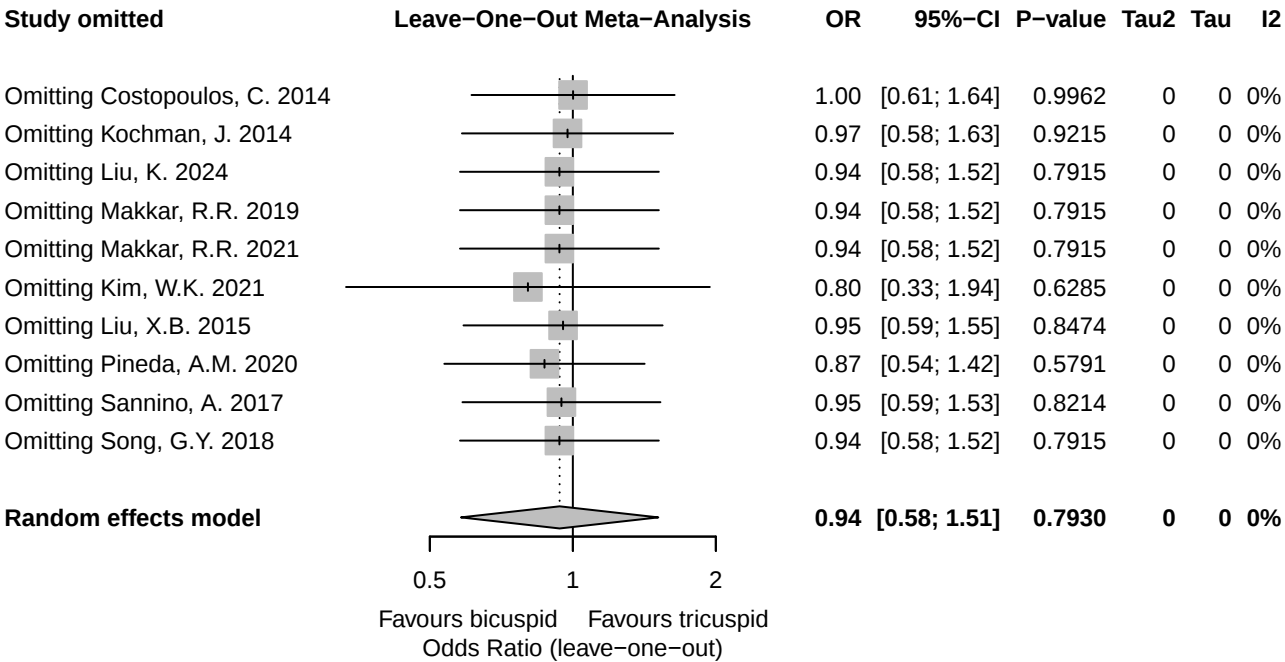
(A) Sensitivity Analysis for Device success with NOS



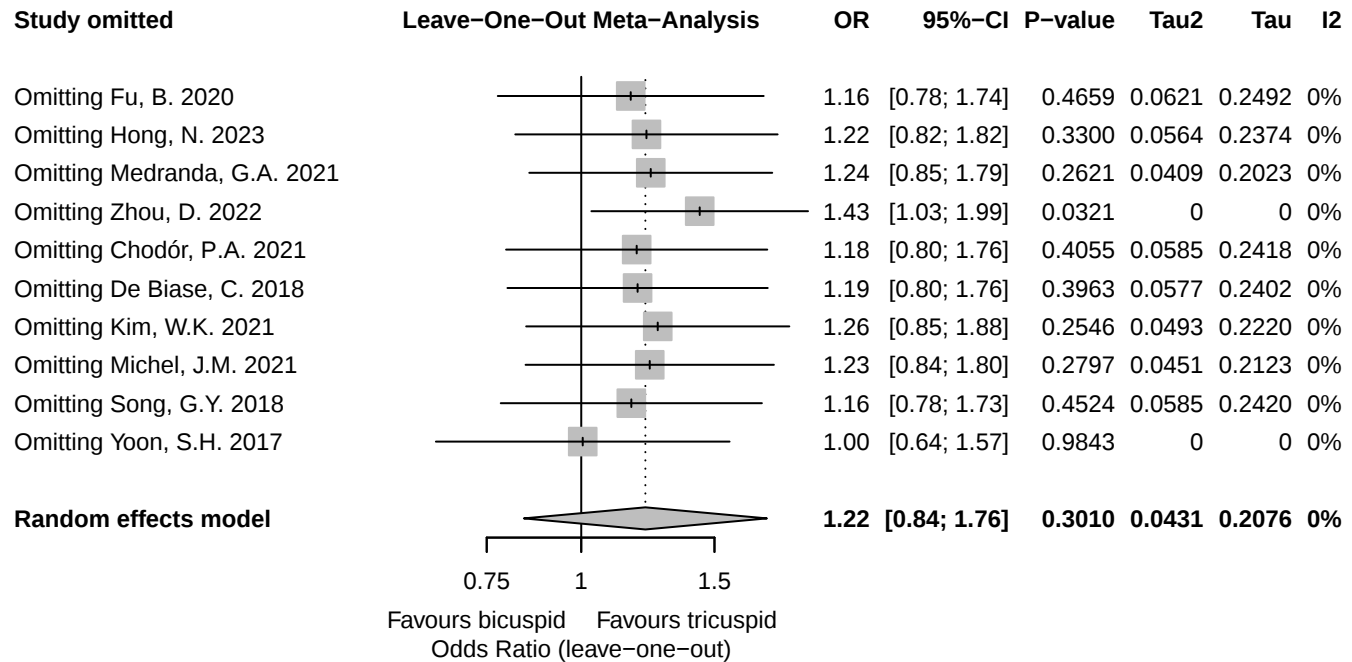
(B) Sensitivity Analysis for In-hospital mortality with NOS



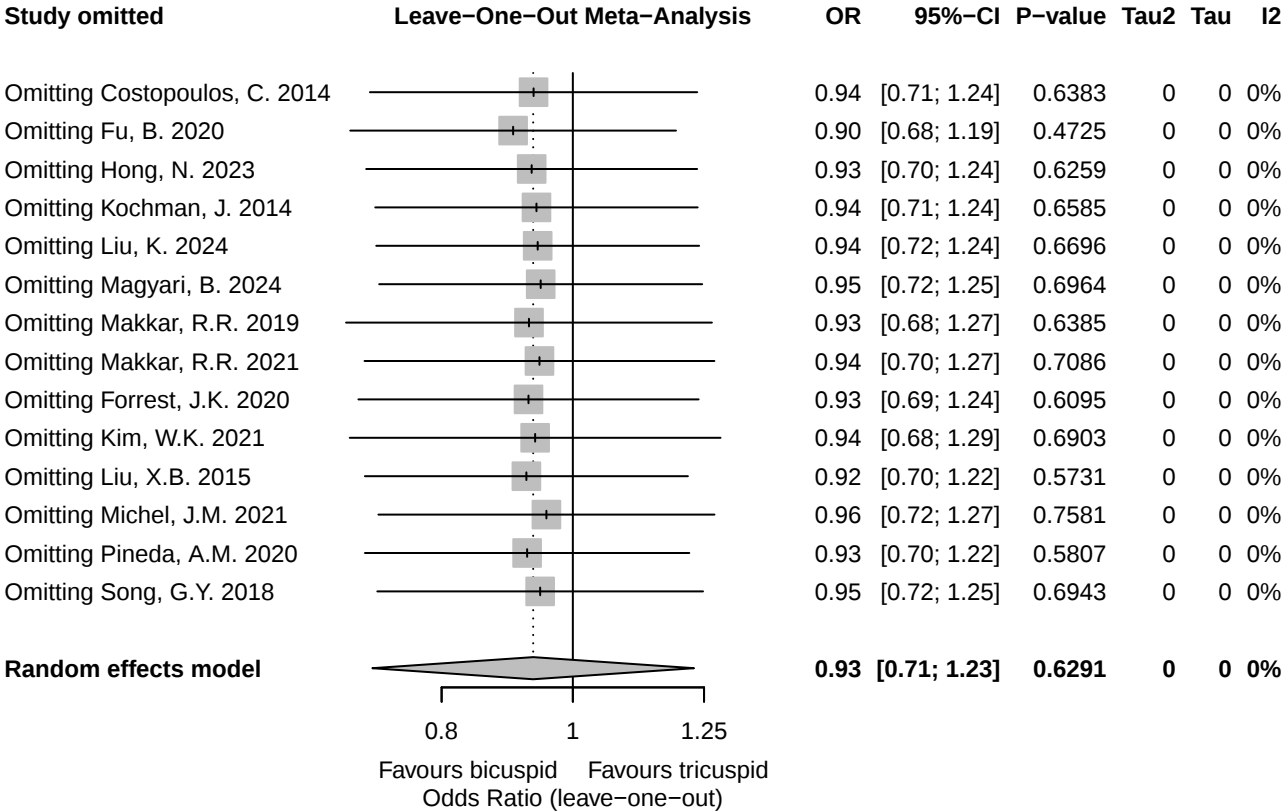
(C) Sensitivity Analysis for Bleeding life-threatening with NOS



(D) Sensitivity Analysis for Moderate/severe PVL with NOS



(E) Sensitivity Analysis for Major vascular complications with NOS



(F) Sensitivity Analysis for 30-day All-cause mortality with NOS

