Supplementary data

Supplementary Appendix 1. PRISMA checklist.

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	2
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	4
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	4
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	5
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	5
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	5, supplementary data
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	supplementary data
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	5, figure 1, supplementary data
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	5
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	5, 6, 7

Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	6, 7
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	6, 7
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	6, 7

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	6, 7
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	6, 7
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	8, figure 1
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	8, supplementary data
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	8
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	8, 9
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	8, 9
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	8, 9, supplementary data
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-	9, 10,

		regression [see Item 16]).	supplementary data
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	11, 12, 13, 14
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	16
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	14, 15, 16
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	1

From: Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement. PLoS Med 6(7): e1000097. doi:10.1371/journal.pmed1000097

Supplementary Appendix 2. MOOSE reporting checklist.

Reporting of background should include
Problem definition ***page 4***
Hypothesis statement ***pages 4, 11-14***
Description of study outcome(s) ***page 6***
Type of exposure or intervention used ***page 5***
Type of study designs used ***page 5***
Study population ***page 5***

Reporting of search strategy should include
Qualifications of searchers (eg, librarians and investigators) ***page 5***
Search strategy, including time period included in the synthesis and keywords ***page 5, supplementary method 3***
Effort to include all available studies, including contact with authors ***page 5***
Databases and registries searched ***page 5, supplementary method 3***
Search software used, name and version, including special features used (eg, explosion) ***page 5, suppl method 3***
Use of hand searching (eg, reference lists of obtained articles) ***page 5, supplementary method 3***
List of citations located and those excluded, including justification ***figure 1***
Method of addressing articles published in languages other than English ***page 5***
Method of handling abstracts and unpublished studies ***page 5***
Description of any contact with authors ***page 5***

Reporting of methods should include
Description of relevance or appropriateness of studies assembled for assessing the hypothesis to be tested ***pages 13-15***
Rationale for the selection and coding of data (eg, sound clinical principles or convenience) ***pages 5-7***
Documentation of how data were classified and coded (eg, multiple raters, blinding, and interrater reliability) ***pages 5-7***
Assessment of confounding (eg, comparability of cases and controls in studies where appropriate) ***pages 5-7***
Assessment of study quality, including blinding of quality assessors; stratification or regression on possible predictors of study results ***page 5-7***
Assessment of heterogeneity ***pages 5-7***
Description of statistical methods (eg, complete description of fixed or random effects models, justification of whether the chosen models account for predictors of study results, dose-response models, or cumulative meta-analysis) in sufficient detail to be replicated ***pages 5-7***
Provision of appropriate tables and graphics ***Table 1,2, Figures 1-3***

Reporting of results should include
Graphic summarising individual study estimates and overall estimate ***Figures 1-3, Central Illustration***
Table giving descriptive information for each study included ***Table 1, Supplementary Tables 1,3***
Results of sensitivity testing (eg, subgroup analysis) ***pages 9-10***
Indication of statistical uncertainty of findings ***page 8-10***

Reporting of discussion should include
Quantitative assessment of bias (eg, publication bias) ***Supplementary Table 2***
Justification for exclusion (eg, exclusion of non–English-language citations) ***Figure 1***
Assessment of quality of included studies ***Table 1 and Supplementary Table 3***

Reporting of conclusions should include
Consideration of alternative explanations for observed results ***pages 11-15***
Generalisation of the conclusions (ie, appropriate for the data presented and within the domain of the literature review) ***pages 11-15***
Guidelines for future research ***page 15***
Disclosure of funding source ***page 1***

Supplementary Appendix 3. Database search results.

Database	Search strategy	Search results
PubMed/MEDLINE	(tricuspid[ti]) AND ((replacement[tiab]) OR (bioprosthetic[tiab]) OR (mechanical[tiab]) OR (intervention[tiab]) OR (surgery[tiab]))	3054
Web of Science	(TI=(tricuspid)) AND (AB=(intervention) OR AB=(replacement)OR AB=(surgery)OR AB=(bioprosthetic) OR AB=(mechanical))	1801
SCOPUS	TITLE (tricuspid) AND (TITLE-ABS (replacement) OR TITLE-ABS (intervention) OR TITLE-ABS (surgery) OR TITLE-ABS (bioprosthetic) OR TITLE-ABS (mechanical))	3222
EMBASE	tricuspid:ti AND (replacement:ab,ti OR surgery:ti OR intervention:ab,ti OR bioprosthetic:ab,ti OR mechanical:ab,ti)	3149
www.escardio.org www.acc.org www.heart.org www.pcronline.com www.tctmd.com www.crtonline.gov www.clinicaltrials.gov www.clinicaltrialsregister.eu	Keywords: “tricuspid”, “replacement”, “surgery”, “bioprosthetic”, “mechanical”.	

MEDLINE: Medical Literature Analysis and Retrieval System Online; EMBASE: Excerpta Medica Database

Supplementary Appendix 4. Definitions.

Study	Acute kidney injury	Liver disease	Bleeding	Structural valve deterioration	Respiratory complications
Sanfelippo et al. 1976	-	-	Not defined		Not defined
Munro et al. 1995	-	-	-	Chronically thickened and rolled leaflets in the open position	-
Do et al. 2000	-	-	Requiring re-exploration		-
Mangoni et al. 2001	Creatinine > 3 mg/dl	Hepatomegaly	Not defined	Thickening and stiffening of the cusps	Mechanical ventilation > 72 hours of or reintubation
Tokunaga et al. 2008	-	-	-	Primary tissue failure	-
Capoun et al. 2010	-	-	-	Not defined	-
Kim et al. 2013	Not defined	Cirrhosis	Requiring re-exploration	Not defined	-
Bevan et al. 2014	Acute renal failure requiring renal replacement therapy	Hepatomegaly	Requiring re-exploration		-
Buzzatti et al. 2014	Not defined	Ascites	Requiring re-exploration		-
Farag et al. 2017	Not defined	Liver enlargement	-		-
Hanedan et al. 2017	-	Hepatomegaly	Requiring re-exploration		Not defined
Çakıcı et al. 2018	-	-	Not defined		-
Chen et al. 2018	One or more of the following: 1) creatinine > 2 mg/dl or >50% from baseline 2) Need for dialysis	Liver congestion	Requiring re-exploration		Mechanical ventilation ≥ 72 hours, tracheostomy, or re-intubation.
Moutakiallah et al. 2018	Not defined	-	Major internal or external bleeding that causes death, hospitalisation, permanent injury, or required transfusion	Not defined	Mechanical ventilation ≥ 24 hours, tracheostomy, or re-intubation.
Kundi et al. 2019	Not defined	-	Not defined		Not defined
Liang et al. 2019	Not defined	-	Requiring re-exploration	Not defined	Not defined

Chen et al. 2020	-	Hepatomegaly	-		-
Wong et al. 2020	-	Cirrhosis	-		-
Yan et al. 2020	Not defined	Congestive liver failure or hepatic insufficiency	Need for blood transfusion		Severe pulmonary infection
Lee et al. 2021	-	Cirrhosis	Transfusion of >10 units of packed red blood cells		-
Leviner et al. 2021	Need for hemodialysis	-	Requiring re-exploration		-
Liu et al. 2021	-	Total bilirubin >2 mg/dl or hepatic transaminase > 5x normal upper limit	Not defined	Not defined	-
Park et al. 2021	-	-	Requiring re-exploration		-
Tafti et al. 2021	-	-	-	Not defined	-

Supplementary Table 1. Baseline characteristics of included patients.

Study (year)	Age (years ± SD)	Female (%)	NYHA III/IV (%)	Prior cardiac surgery (%)	Secondary etiology (%)
Sanfelippo et al. 1976	-	-	-	14(93)	-
Glower et al. 1995	-	-	-	21(60)	-
Munro et al. 1995	-	-	-	-	-
Do et al. 2000	48	18(62)	27(93)	22(76)	-
Mangoni et al. 2001	61±3	9(60)	11(73)	13(87)	-
Maleszka et al. 2004	-	-	13(65)	-	-
Solomon et al. 2004	-	-	-	26(79)	-
Iscan et al. 2007	-	-	-	-	-
Tokunaga et al. 2008	-	-	-	-	-
Capoun et al. 2010	-	-	-	-	0(0)
Baraki et al. 2013	-	-	-	-	-
Kim et al. 2013	56.1±10.7	8(57)	8(57)	0(0)	-
Bevan et al. 2014	46.0	21(72)	7(24)	20(69)	-
Buzzatti et al. 2014	61.7±10.7	44(72)	48(79)	61(100)	-
Farag et al. 2017	55.7±15.9	37(54)	-	37(54)	37(54)
Hanedan et al. 2017	51.1±10.5	24(80)	19(63)	30(100)	-
Rossello et al. 2017	-	-	-	-	-
Çakıcı et al. 2018	-	-	-	-	0(0)
Chen et al. 2018	49.1±12.9	76(64)	101(86)	49(42)	-
Fang et al. 2018	-	-	-	90(100)	90(100)
Moutakiallah et al. 2018	-	-	-	11(100)	1(9)
Di Mauro et al. 2019	-	-	-	-	0(0)
Kundi et al. 2019	-	-	-	-	-
Liang et al. 2019	45.7±13.2	51(67)	19(25)	0(0)	0(0)
Chen et al. 2020	53.6±12.5	69(64)	81(76)	107(100)	-
Dreyfus et al. 2020	-	-	-	-	135(49)
Sánchez-Espín G et al. 2020	-	-	-	-	-
Wong et al. 2020	53.5±15.9	61(45)	-	0(0)	-
Yan et al. 2020	54.8±6.5	40(82)	38(78)	49(100)	49(100)

Kawsara et al. 2021	-	-	-	0(0)	-
Lee et al. 2021	37.6±13.1	78(36)	-	19(9)	0(0)
Leviner et al. 2021	60.7±11	24(73)	30(91)	21(64)	-
Liu et al. 2021	39.0±16	116(62)	99(53)	17(9)	37(20)
Park et al. 2021	59.8±11.5	71(67)	49(46)	65(61)	83(78)
Tafti et al. 2021	48.8±13.5	31(66)	-	-	-
Pooled estimates: mean/incidence (95% CI)	53 (49-56)	63 (57-69)	67 (53-78)	60 (27-85)	22 (4-69)

Continued…

Study (year)	Endocarditis (%)	Diabetes (%)	Hypertension (%)	Atrial fibrillation (%)	Liver disease (%)	LVEF (% ± SD)
Sanfelippo et al. 1976	-	-	-	-	-	-
Glower et al. 1995	-	-	-	-	-	-
Munro et al. 1995	-	-	-	-	-	-
Do et al. 2000	-	-	-	-	-	-
Mangoni et al. 2001	2(13)	4(27)	5(33)	-	12(80)	-
Maleszka et al. 2004	6(30)	-	-	-	-	-
Solomon et al. 2004	-	-	-	-	-	-
Iscan et al. 2007	-	-	-	-	-	-
Tokunaga et al. 2008	4(13)	-	-	-	-	-
Capoun et al. 2010	11(100)	-	-	-	-	-
Baraki et al. 2013	18(100)	-	-	-	-	-
Kim et al. 2013	0(0)	2(14)	3(21)	6(43)	0(0)	59.6±6.9
Bevan et al. 2014	5(17)	-	-	-	13(45)	-
Buzzatti et al. 2014	0(0)	9(15)	-	54(89)	24(39)	54.4±8.3
Farag et al. 2017	32(47)	15(22)	30(44)	-	21(31)	-
Hanedan et al. 2017	-	-	-	24(80)	22(73)	-
Rossello et al. 2017	-	-	-	-	-	-
Çakıcı et al. 2018	25(100)	-	-	-	-	-
Chen et al. 2018	-	5(4)	17(14)	62(53)	45(38)	66.0±6.3
Fang et al. 2018	-	-	-	-	-	-
Moutakiallah et al. 2018	-	-	-	-	-	-
Di Mauro et al. 2019	80(100)	-	-	-	-	-
Kundi et al. 2019	-	-	-	-	-	-
Liang et al. 2019	0(0)	-	7(9)	30(39)	-	61.8±7.5
Chen et al. 2020	-	6(6)	-	68(64)	53(50)	51.6±6.2
Dreyfus et al. 2020	78(29)	-	-	-	-	-
Sánchez-Espín G et al. 2020	0(0)	-	-	-	-	-
Wong et al. 2020	0(0)	23(17)	44(32)	57(42)	18(13)	-
Yan et al. 2020	0(0)	7(14)	20(41)	44(90)	12(24)	57.9±3.5
Kawsara et al. 2021	0(0)	-	-	-	-	-
Lee et al. 2021	216(100)	17(8)	18(8)	-	16(7)	-

Leviner et al. 2021	0(0)	9(27)	16(48)	27(82)	-	-
Liu et al. 2021	22(12)	23(12)	19(10)	62(33)	19(10)	62.0±6.0
Park et al. 2021	0(0)	12(11)	27(25)	59(56)	-	57.9±3.5
Tafti et al. 2021	-	6(13)	-	-	-	47.4±7.8
Pooled estimates: mean/incidence (95% CI)	18 (4-52)	13 (10-17)	23 (15-33)	63 (48-75)	31 (18-48)	58 (54-61)

CI: confidence interval; LVEF: left ventricular ejection fraction; NYHA: New York Heart Association; NR: not reported; SD: standard deviation.

Supplementary Table 2. Risk of bias assessment – observational studies.
Risk of bias in non-randomized studies of interventions assessment tool from the Cochrane handbook (ROBINS-I) for the outcome of operative mortality.

Study		**Pre-Intervention**		**At Intervention**	**Post-intervention**				**Overall risk of bias**
Study	***Year***	***Bias due to confounding***	***Bias in selection of participants into the study***	***Bias in classification of interventions***	***Bias due to deviations from intended interventions***	***Bias due to missing data***	***Bias in measurement of outcomes***	***Bias in selection of the reported result***	***Low/ moderate/ high***
Sanfelippo et al.	1976	✗	✓	✓	✓	✓	✓	✓	✗
Glower et al.	1995	⚠	✓	✓	✓	✓	✓	✓	⚠
Munro et al.	1995	✗	✓	✓	✓	✓	✓	✓	✗
Do et al.	2000	NA	NA	NA	NA	NA	NA	NA	✗
Mangoni et al.	2001	⚠	✓	✓	✓	✓	✓	✓	⚠
Maleszka et al.	2004	NA	NA	NA	NA	NA	NA	NA	✗
Solomon et al.	2004	✗	✓	✓	✓	✓	✓	✓	✗
Iscan et al.	2007	⚠	✓	✓	✓	✓	✓	✓	⚠
Tokunaga et al.	2008	✗	✓	✓	✓	✓	✓	✓	✗
Capoun et al.	2010	⚠	✓	✓	✓	✓	✓	✓	⚠
Baraki et al.	2013	✗	⚠	✓	✓	⚠	✓	✓	✗
Kim et al.	2013	⚠	✓	✓	✓	✓	✓	✓	⚠
Bevan et al.	2014	⚠	✓	✓	✓	✓	✓	✓	⚠
Buzzatti et al.	2014	⚠	✓	✓	✓	✓	✓	✓	⚠
Farag et al.	2017	⚠	✓	✓	✓	✓	✓	✓	⚠
Hanedan et al.	2017	✓	✓	✓	✓	✓	✓	✓	✓
Rossello et al.	2017	⚠	✓	✓	✓	✓	✓	✓	⚠
Çakıcı et al.	2018	⚠	✓	✓	✓	✓	✓	✓	⚠

Chen et al.	2018	⚠	✓	✓	✓	✓	✓	✓	⚠
Fang et al.	2018	⚠	✓	✓	✓	✓	✓	✓	⚠
Moutakiallah et al.	2018	⚠	✓	✓	✓	✓	✓	✓	⚠
Di Mauro et al.	2019	✗	⚠	✓	✓	✓	⚠	✓	✗
Kundi et al.	2019	⚠	⚠	✓	✓	✓	✓	✓	⚠
Liang et al.	2019	✗	⚠	✓	✓	✓	✓	✓	✗
Chen et al.	2020	⚠	✓	✓	✓	✓	✓	✓	⚠
Dreyfus et al.	2020	⚠	✓	✓	✓	✓	✓	✓	⚠
Sánchez-Espín G et al.	2020	⚠	✓	✓	✓	✓	✓	✓	⚠
Wong et al.	2020	⚠	✓	✓	✓	✓	✓	✓	⚠
Yan et al.	2020	⚠	✓	✓	✓	✓	✓	✓	⚠
Kawsara et al.	2021	⚠	✓	✓	✓	✓	✓	✓	⚠
Lee et al.	2021	⚠	✓	✓	✓	✓	✓	✓	⚠
Leviner et al.	2021	⚠	✓	✓	✓	✓	✓	✓	⚠
Liu et al.	2021	⚠	⚠	✓	✓	✓	✓	✓	⚠
Park et al.	2021	⚠	✓	✓	✓	✓	✓	✓	⚠
Tafti et al.	2021	⚠	✓	✓	✓	⚠	✓	✓	⚠

✓ = low risk; ⚠ = moderate risk; ✗ = high risk

Supplementary Table 3. Key study features – bioprosthetic tricuspid valve replacement.

Study	Year	Patients	Operative Time	Country	Multicenter (n)	Follow-up (years)
Glower et al.	1995	35	1974-1993	USA	No	In-hospital
Tokunaga et al.	2008	27	1975-2004	Japan	No	8
Baraki et al.	2013	14	1996-2012	Germany	No	6
Kim et al.	2013	10	1996-2010	Korea	No	3
Hanedan et al.	2017	10	2004-2011	Turkey	No	2
Chen et al.	2018	102	2003-2016	China	No	In-hospital
Fang et al.	2018	74	2007-2016	China	No	9
Kundi et al.	2019	1737	2003-2014	USA	Yes (841)	1
Liang et al.	2019	43	2010-2017	China	No	4
Chen et al.	2020	25	2009-2017	China	No	5
Sánchez-Espín G et al.	2020	48	1996-2017	Spain	No	4
Yan et al.	2020	49	2012-2019	China	No	2
Kawsara et al.	2021	468	2016-2017	USA	Yes	In-hospital
Liu et al.	2021	145	1999-2018	China	Yes (2)	11

Supplementary Table 4. Meta-regression analysis.

Covariate	β	Lower bound	Upper bound	Standard Error	p value
Operative Mortality					
Year of publication	-0.037	-0.063	-0.011	0.013	0.006
Operative period >1995 (ref. <1995)	-0.626	-1.392	1.140	0.7376	0.105
Europe (ref. North America)	-0.467	-1.332	0.398	0.423	0.278
Asia (ref. North America)	-0.593	-1.357	0.171	0.373	0.123
Low Risk of Bias (ref. High)	0.858	-0.747	2.462	0.788	0.285
Moderate Risk of Bias (ref. High)	-0.423	-1.090	0.245	0.328	0.206
Bioprostheses	-0.006	-0.018	0.006	0.006	0.337
Age	0.006	-0.066	0.078	0.034	0.865
Sex (female)	0.005	-0.038	0.048	0.020	0.798
Hypertension	0.014	-0.027	0.054	0.018	0.461
Diabetes	-0.002	-0.081	0.076	0.036	0.948
Atrial Fibrillation	0.020	-0.013	0.053	0.015	0.201
Liver disease	0.021	0.006	0.037	0.007	0.013
Secondary TR	-0.008	-0.024	0.007	0.007	0.264
Previous Cardiac Surgery	0.010	-0.000	0.021	0.005	0.056
Endocarditis	0.006	-0.001	0.013	0.003	0.092
LV Ejection Fraction	-0.116	-0.241	0.010	0.053	0.065

LV: left ventricle; TR: tricuspid regurgitation

Supplementary Table 5. Early and late outcomes – no endocarditis.

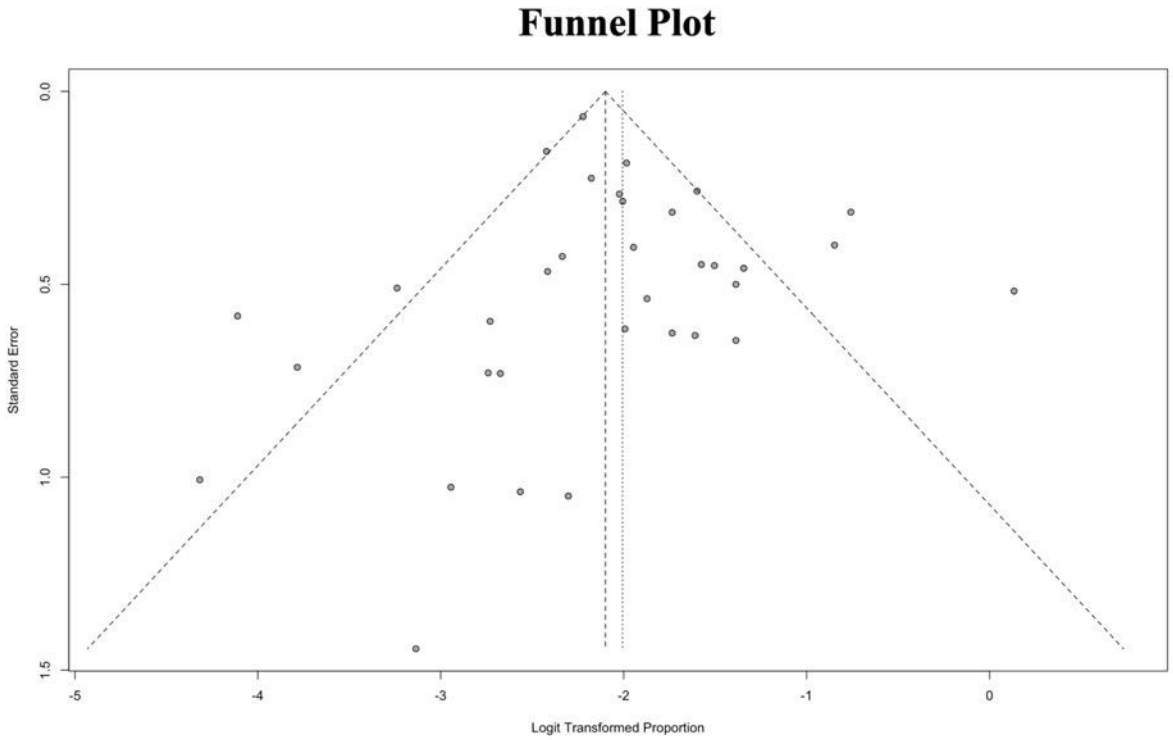
Outcome	Proportion/Incidence rate % (95% CI)	I^2 % (χ^2 P-value)	N. of studies
EARLY OUTCOMES			
Operative Mortality	12 (9–17)	74 (<0.01)	23
Bleeding	11 (6-19)	85 (<0.01)	12
Acute Kidney Injury	14 (7-25)	90 (<0.01)	8
Renal Replacement Therapy	6 (2-19)	70 (<0.01)	4
Pacemaker	9 (5-16)	71 (<0.01)	9
Respiratory Complications	15 (11-19)	0 (0.64)	6
Stroke	2 (1-5)	80 (<0.01)	6
Wound Infection	3 (1-5)	80 (<0.01)	7
LATE OUTCOMES			
Late Mortality*	7 (4-12)	94 (<0.01)	15
Re-intervention*	2 (1-3)	31 (0.17)	9
Structural Valve Deterioration*	4 (3-6)	44 (0.13)	5
Valve Thrombosis*	1 (0-3)	0 (0.56)	3
Recurrence of TR ≥2*	5 (2-13)	85 (<0.01)	4
BIOPROSTHESES			
Late Mortality*	7 (2-23)	91 (<0.01)	6
Re-intervention*	1 (0-3)	0 (0.58)	4
Structural Valve Deterioration*	5 (3-9)	34 (0.22)	2
Valve Thrombosis*	1 (0-2)	0 (0.77)	2
Recurrence of TR ≥2*	5 (2-15)	89 (<0.01)	3

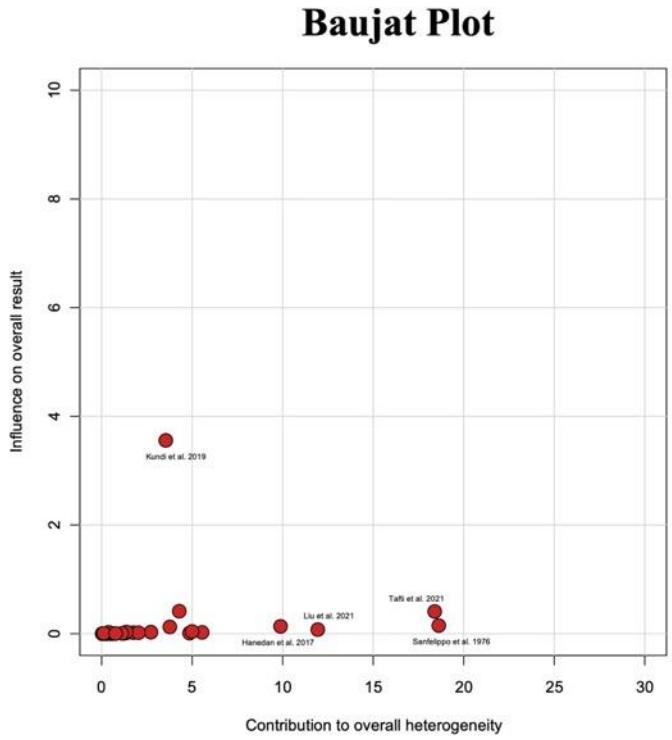
* per 100 person-years
CI: confidence interval; TR: tricuspid regurgitation

Supplementary Table 6. Early and late outcomes – fixed effects models.

Outcome	Proportion/Incidence rate % (95% CI)	I^2 % (χ^2 P-value)	N. of studies
EARLY OUTCOMES			
Bleeding	10 (9-12)	83 (<0.01)	17
Acute Kidney Injury	12 (11-14)	89 (<0.01)	11
Renal Replacement Therapy	11 (8-14)	63 (0.01)	7
Pacemaker	11 (9-14)	75 (<0.01)	13
Respiratory Complications	15 (12-20)	0 (0.56)	7
Stroke	1 (1-2)	74 (<0.01)	9
Wound Infection	2 (1-2)	81 (<0.01)	10
LATE OUTCOMES			
Late Mortality*	19 (18-20)	96 (<0.01)	23
Re-intervention*	2 (2-3)	64 (<0.01)	15
Structural Valve Deterioration*	2 (2-3)	82 (<0.01)	9
Valve Thrombosis*	1 (0-1)	49 (0.07)	8
Recurrence of TR ≥2*	5 (3-8)	85 (<0.01)	4
BIOPROSTHESES			
Late Mortality*	22 (20-24)	97 (<0.01)	8
Re-intervention*	1 (1-2)	77 (<0.01)	5
Structural Valve Deterioration*	2 (2-4)	91 (<0.01)	4
Valve Thrombosis*	0 (0-1)	68 (0.04)	3
Recurrence of TR ≥2*	8 (5-13)	33 (0.22)	3

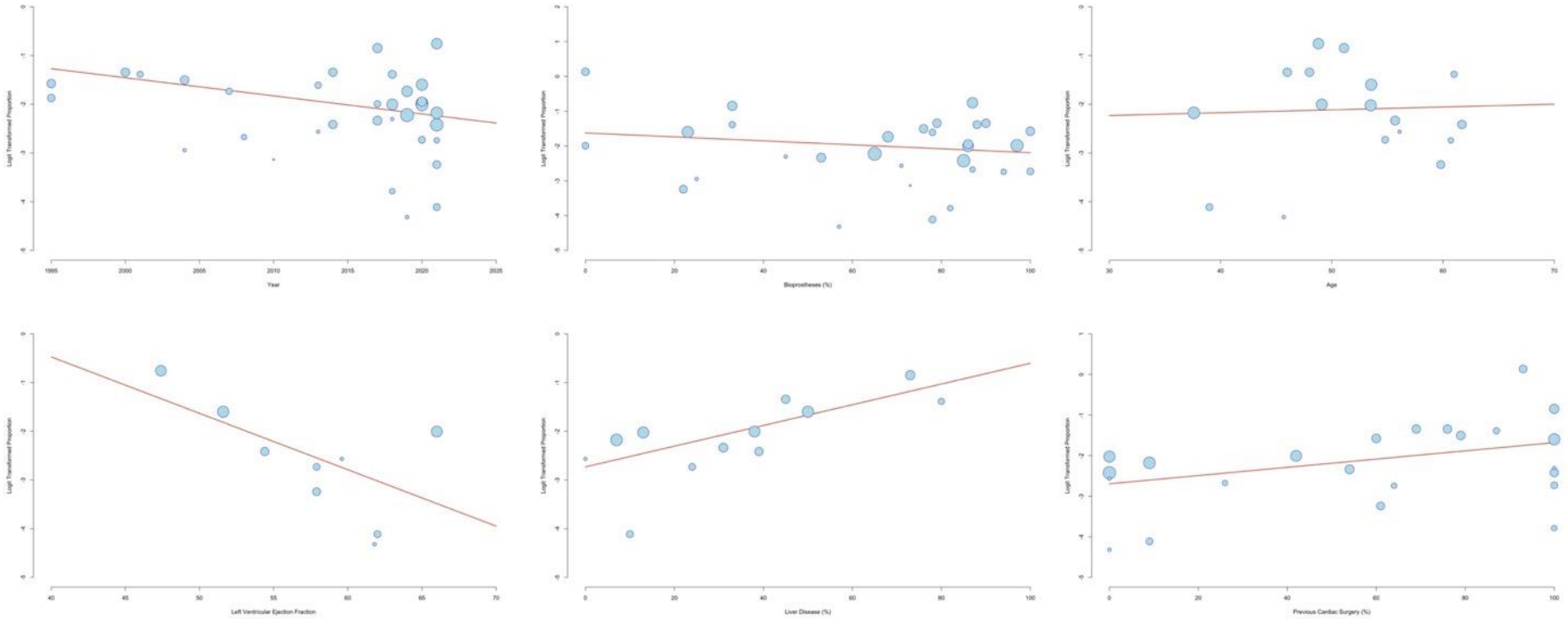
* per 100 person-years
CI: confidence interval; TR: tricuspid regurgitation



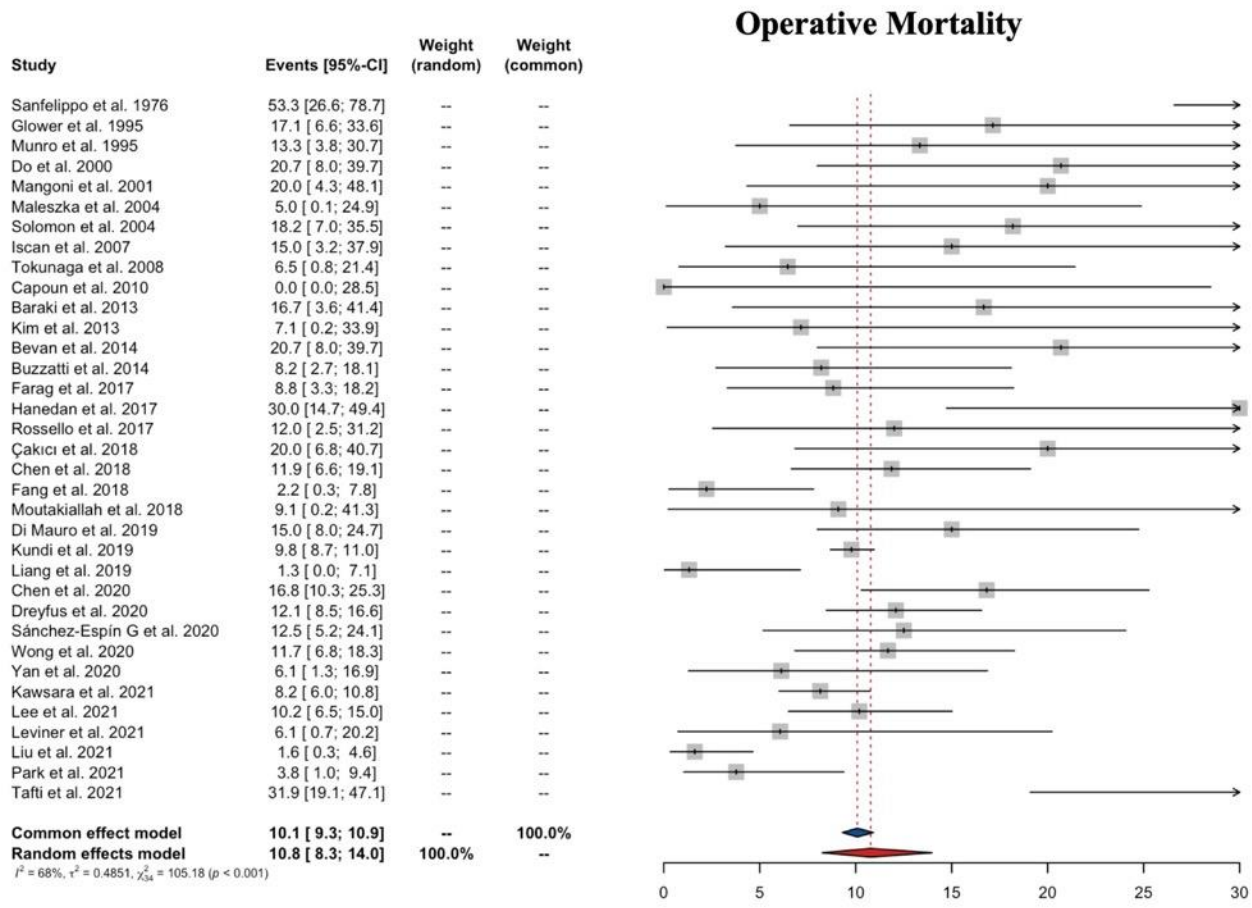


Supplementary Figure 1. Funnel plot and Baujat plot.

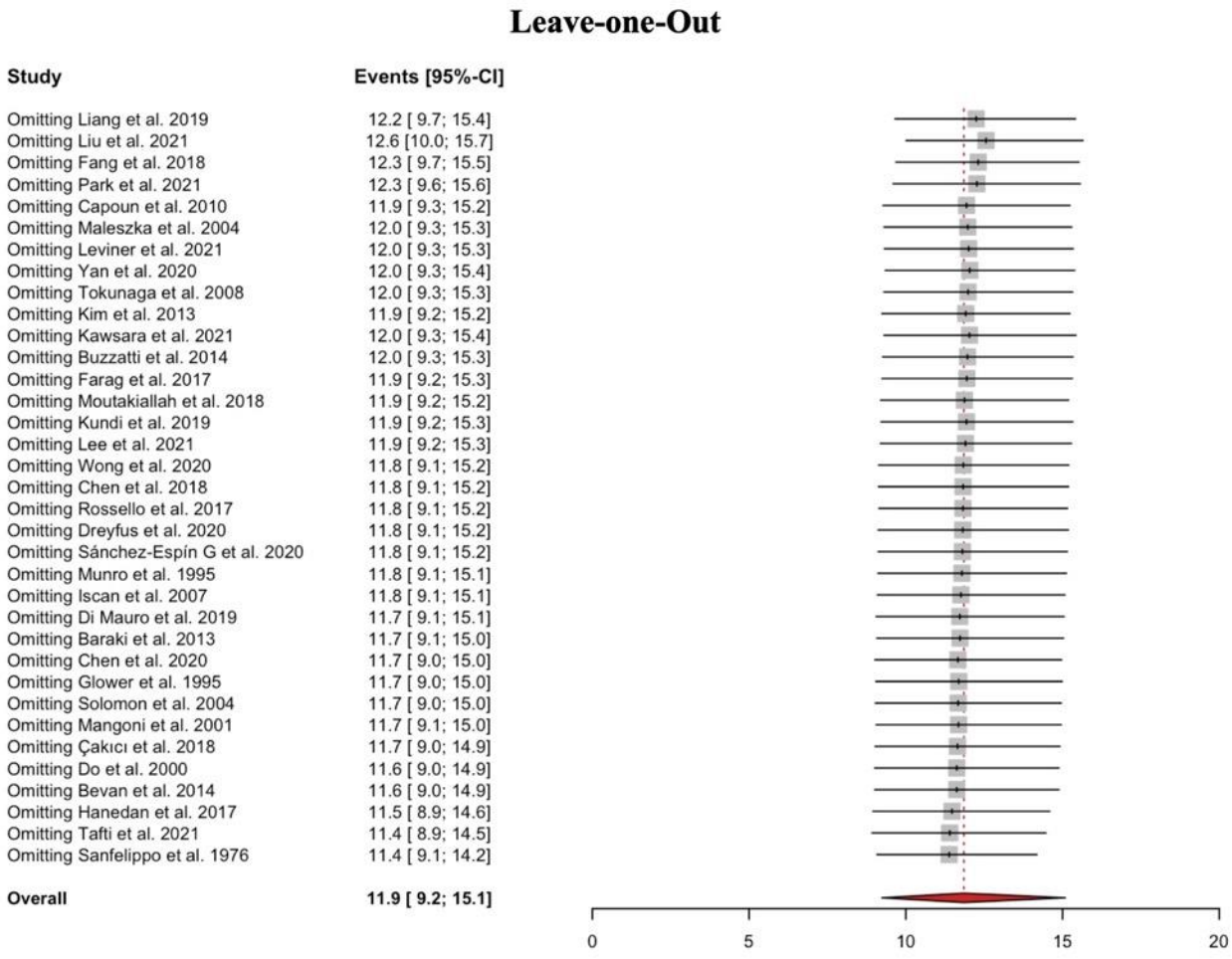
Funnel plot and Baujat plot of primary endpoint (operative mortality).



Supplementary Figure 2. **Bubble plots for meta-regression analysis.**
Bubble plots of the effect of continuous covariates on the overall estimate of primary endpoint (operative mortality) with predicted regression line (red). The size of the bubbles is proportional to the study weights

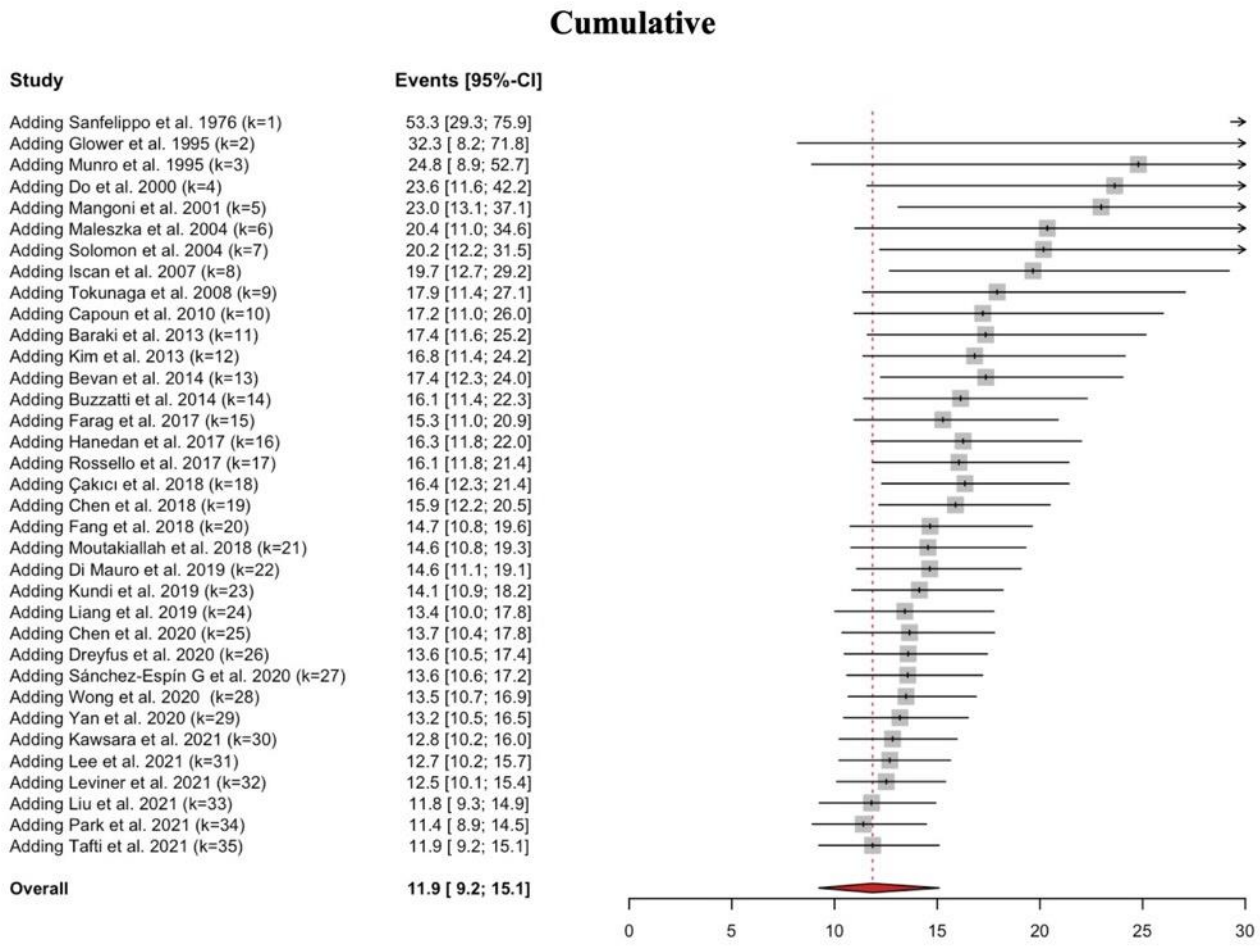


Supplementary Figure 3. **Meta-analysis using a random intercept logistic regression model.** Forest plot of primary endpoint (operative mortality) assessed with a random intercept logistic regression model. CI = confidence interval.



Supplementary Figure 4. Leave-one-out meta-analysis.

Forest plots of primary endpoint (operative mortality) assessed excluding one study per analysis (leave-one-out) with random-effects models.
CI = confidence interval



Supplementary Figure 5. Cumulative meta-analysis.
Forest plots of primary endpoint (operative mortality) assessed adding one study at a time (cumulative) with random-effects models analysis. *CI = confidence interval.*