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Comparative effectiveness of ultrathin vs. standard strut drug-eluting stents: insights from a large-scale meta-analysis with extended follow-up

Ahmed Hassan^{1,2*}, Ahmed Mazen Amin³, Ahmed Farid Gadelmawla⁴, Ahmed Mansour⁵, Hamed Abdelma'aboud Mostafa⁶, Mariam Tarek Desouki⁷, Mostafa Mahmoud Naguib⁶, Bilal Ali⁸, Aisha Siraj⁹, Mustafa Suppah¹⁰ and Diaa Hakim¹¹

Abstract

Background Newer generation ultrathin strut stents are associated with less incidence of target lesion failure (TLF) in patients undergoing percutaneous coronary intervention (PCI) in the short term. However, its long-term effect on different cardiovascular outcomes remains unknown.

Objectives We aim to identify the effects of newer-generation ultrathin-strut stents vs. standard thickness second-generation drug-eluting stents (DES) on long-term outcomes of revascularization in coronary artery disease.

Methods We searched PubMed, Web of Science, Cochrane Library databases, and Scopus for randomized controlled trials (RCTs) and registries that compare newer-generation ultrathin-strut (< 70 mm) with thicker strut (> 70 mm) DES to evaluate cardioprotective effects over a period of up to 5 years. Primary outcome was TLF, a composite of cardiac death, target vessel myocardial infarction (TVMI) or target lesion revascularization (TLR). Secondary outcomes included the components of TLF, stent thrombosis (ST), and all-cause death were pooled as the standardized mean difference between the two groups from baseline to endpoint.

Results We included 19 RCTs and two prospective registries (103,101 patients) in this analysis. The overall effect on the primary outcome was in favor of second-generation ultrathin struts stents in terms of TLF at \geq 1 year, \geq 2 years, and \geq 3 years (*P* value = 0.01, 95% CI [0.75, 0.96]), *P* value = 0.003, 95% CI [0.77, 0.95]), *P* value = 0.007, 95% CI [0.76, 0.96]), respectively. However, there was no reported benefit in terms of TLF when we compared the two groups at \geq 5 years (*P* value = 0.21), 95% CI [0.85, 1.04]). Some of the reported components of the primary and secondary outcomes, such as TLR, target vessel revascularization (TVR), and TVMI, showed the same pattern as the TLF outcome.

Conclusion Ultrathin-strut DES showed a beneficial effect over thicker strut stents for up to 3 years. However, at the 5-year follow-up, the ultrathin strut did not differ in terms of TLF, TLR, TVR, and TVMI compared with standard-thickness DES, with similar risks of patient-oriented composite endpoint (POCE), MI, ST, cardiac death, and all-cause mortality.

Keywords Ultrathin-strut drug-eluting stent, DES, Percutaneous coronary intervention, Meta-analysis

*Correspondence: Ahmed Hassan 20161300@o6u.edu.eg Full list of author information is available at the end of the article



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Introduction

Percutaneous coronary intervention (PCI) is the recommended revascularization approach for restoring blood flow to the heart in patients with stable coronary artery disease (SCAD) when medical treatment fails to enhance prognosis or alleviate symptoms (chest pain, weakness, short of breath) [1]. Additionally, it is the recommended reperfusion strategy for patients presenting with acute ST-segment elevation myocardial infarction (STEMI) [2]. The implementation of first-generation drug-eluting stents (DES) decreased the occurrence of restenosis compared to bare metal stents. However, this advancement was at the expense of higher rates of stent thrombosis (ST). The incidence of definite very late ST ranges from 0.6 to 0.7% per year, while the rate of major adverse cardiac events (MACE) showed a steady increase of 2.6% annually [3]. The occurrence of unfavorable outcomes with the first-generation and contemporary permanent polymer-based DES provides a chance for step-by-step enhancement [4-9].

Improved stent design, enhanced polymer coating, and the rate of release of antiproliferative agents have contributed to DES's increased safety and efficacy. Secondgeneration thin-strut DES have demonstrated a reduced risk of restenosis, ST, myocardial infarction (MI), or even death compared to older-generation DES or bare metal stents [10, 11]. Additionally, newer generations of stents with ultrathin strut thickness or biodegradable polymers can accelerate endothelialization, enhance healing, reduce inflammation and arterial injury, and decrease neointimal proliferation and thrombogenicity [12].

Recent research showed that ultrathin-strut DES with a thickness of less than 70 μ m can enhance outcomes even more than second-generation DES [13]. Ultrathin second-generation DES has been found to have lower rates of target lesion failure (TLF) at both 2 years and 3 years compared to second-generation DES with standard thickness, as demonstrated by a recent meta-analysis [14]. Nevertheless, the long-term safety and efficacy of the initial advantages granted by ultrathin second-generation DES is still unknown. Hence, we conducted an updated systematic review and meta-analysis, with an extended follow-up period of 5 years, to compare the clinical outcomes between ultrathin-strut and standard thickness second-generation DES.

Methods

Data collection and extraction

We searched PubMed, Scopus, Web of Science, and Cochrane Library databases up to November 2023 using the search terms: (Ultrathin strut OR Thin strut OR Orsiro stent) AND (Sirolimus-eluting stent OR SES OR drug-eluting stents OR DES) AND (Coronary artery intervention OR Percutaneous coronary intervention OR Coronary angioplasty OR Stent implantation).

Endnote software (Clarivate Analytics, PA, USA) removed duplicates. The retrieved references were screened in two steps: the first consisted of screening the titles/abstracts independently by (A.M, M.N, and A.H) to determine their relevance, and the second consisted of screening the full-text articles of the identified abstracts for final eligibility to the quantitative analysis. The Rayyan website was used in the selection process [15].

Our search identified 994 results after duplicates were removed. Following the title and abstract screening, 53 papers were selected for full-text review. Of them, 50 studies were included in the meta-analysis. No further papers were included after manually searching the references of the included studies. The selection process is illustrated in the PRISMA flow diagram of the study in Fig. 1 and was registered on PROSPERO (CRD42024506460).

Studies enrolled patients with coronary artery disease undergoing PCI, comparing ultrathin sirolimus-eluting stent vs. standard thickness second-generation DES in RCTs, and registries reporting clinical outcomes were included in our meta-analysis. Animal studies, non-English studies, abstracts without available data, and unpublished studies were excluded. The data were extracted to a uniform standardized data extraction sheet, including (1) a summary of study characteristics, (2) stent characteristics, (3) baseline patient characteristics, (4) lesion characteristics and treatment procedures, and (5) clinical outcomes.

Outcomes

The primary endpoints of the current analysis included TLF, a composite of cardiac death, target vessel myocardial infarction (TVMI), and target lesion revascularization (TLR). Secondary outcomes included patient-oriented composite endpoint (POCE) of all-cause death, MI, repeat revascularization, and each component of TLF and ST. All outcomes are up to 5 years of follow-up.

Risk-of-bias assessment

We utilized the revised Cochrane risk-of-bias tool for RCTs (RoB 2) to evaluate the risk of bias in the included clinical trials [16]. This evaluation encompassed an assessment of the randomization process, concealment of the allocation sequence, deviations from the intended interventions, utilization of appropriate analysis to estimate the effect of assignment to intervention, measurement of the outcome, selection of the reported results, and overall risk of bias. The assessment of the methodological quality of the studies was classified as either

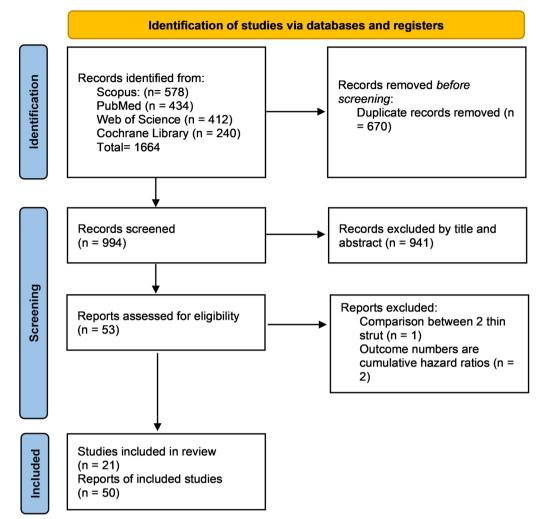


Fig. 1 PRISMA flow diagram of the study

low risk, with some concerns, or high risk of bias. For prospective registries, we used The Cochrane ROBINS-I tool [17], which includes the following domains: (1) bias due to confounding, (2) bias in the selection of participants into the study, (3) bias in the selection of interventions, (4) bias due to deviations from intended interventions, (5) bias due to missing data, bias in the measurement of outcomes, and (6) bias in the selection of the reported result. Any conflicts between the reviewers were resolved by consensus or consultation.

Statistical analysis

We used RevMan v5.3 to conduct the statistical analysis [18]. We used the risk ratio (RR) to pool the results of dichotomous outcomes, and we used the mean difference (MD) with a 95% confidence interval (CI) to pool the continuous outcomes. We used the fixed-effects model. However, the random-effects model was used in case of significant heterogeneity. Chi-square and I-square tests were used to evaluate heterogeneity, where the Chi-square test detects the presence of heterogeneity, and the I-square test evaluates its degree. I-square was interpreted in accordance with the Cochrane Handbook (chapter nine) [19] as follows: heterogeneity is not significant for 0-40%, moderate for 30-60%, substantial for 50-90%, and considerable for 75-100%. We considered an alpha level below 0.1 for the Chi-square test to detect significant heterogeneity. We performed a leaveone-out sensitivity analysis to address the heterogeneity in our pooled studies. By systematically excluding each study one at a time, we identified which studies contributed to the heterogeneity and reported our findings accordingly. We used Stata MP version 17 (Stata Corp) to assess the publication bias by inspection and Egger's test in outcomes reported by ten or more studies. We conducted a subgroup analysis for the follow-up duration as follows: ≥ 1 year (any study's follow-up duration from 1 year to less than 2 years), ≥ 2 years (any study's follow-up duration from 2 years to less than 3 years), ≥ 3 years (any study's follow-up duration from 3 years to less than 4 years), and ≥ 5 years (any study's follow-up duration 5 years or more).

We conducted a subgroup analysis comparing acute coronary syndrome (ACS) and chronic coronary syndrome (CCS) patients for all available outcomes across all follow-up durations. We detected a subgroup difference using the test of subgroup difference.

Results

After a detailed search, 19 RCTs and two registries were included in our meta-analysis [20–69], according to the Cochrane RoB2 and ROBINS-1 assessments. Nine studies had an overall low risk of bias, 11 had some concerns, and one had an overall high risk of bias (Fig. 2). Analysis of publication bias is summarized in Supplementary Table 3.

Characteristics of the included studies

These studies included 103,101 patients who underwent PCI for coronary artery disease (for both CCS and ACS) using ultrathin-struts DES, n=19,001; standard thickness second-generation DES, n=84,100). Nine studies have reached five 5-year follow-ups, five studies have reached three 5-year follow-ups, three studies have reached 2-year follow-ups, and 4 years have reached 1-year follow-ups. The details of studies characteristics are presented in Table S2. Summary of stent characteristics, baseline patient characteristics, lesion characteristics, and intervention procedures of the are outlined in Tables 1, 2, and 3.

Primary outcome

Target lesion failure (TLF)

Ultrathin-struts DES were associated with a significant decreased in the incidence of TLF at ≥ 1 year (RR: 0.85 with 95% CI [0.75, 0.96], P=0.01), at ≥ 2 years (RR: 0.86 with 95% CI [0.77, 0.95], P=0.003), and at ≥ 3 years (RR: 0.85 with 95% CI [0.76, 0.96], P=0.007) compared to standard thickness second-generation DES. However, there was no significant difference between ultrathin-struts DES and standard thickness second-generation DES at 5 years (RR: 0.94 with 95% CI [0.85, 1.04], P=0.21) (Fig. 3).

Cardiac death

There was no significant difference between ultrathinstruts DES and standard thickness second-generation

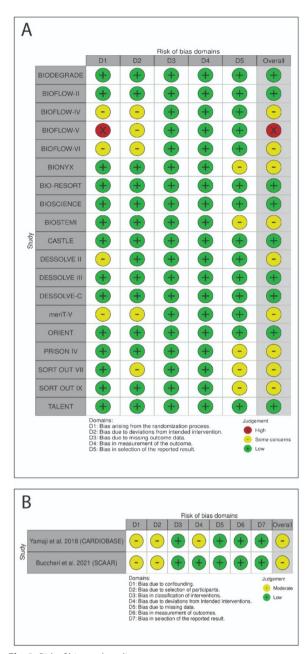


Fig. 2 Risk of bias and quality assessment

DES at ≥ 1 year (RR: 1.00 with 95% CI [0.82, 1.22], *P*=1.00), at ≥ 2 years (RR: 1.12 with 95% CI [0.92, 1.37], *P*=0.27), at ≥ 3 years (RR: 1.03 with 95% CI [0.83, 1.27], *P*=0.81), and at 5 years (RR: 0.98 with 95% CI [0.82, 1.17], *P*=0.84) (Fig. 4).

Target vessel-related myocardial infarction (TVMI)

Ultrathin-struts DES were associated with a decreased incidence of TVMI at ≥ 2 years (RR: 0.81 with 95% CI [0.68, 0.97], P=0.02) compared to standard thickness

Stent	Strut thickness Stent platform	Stent platform	Drug eluted	Timing of drug elution Coating polymer	Coating polymer	Timing of polymer degradation
Orsiro	60 µm	Cobalt-chromium	Sirolimus	12–14 weeks	Biodegradable polymer made of poly-L-lactic 12–24 months acid	12-24 months
Xience Sierra and Xpedition	81 µm	Cobalt–chromium	Everolimus		Durable polymer/nonerasable polymer made of polyvinylidene fluoride-hexafluo- ropropylene	24 months
TIVOLI	80 µm	Cobalt-chromium (L605)	Sirolimus	75% at 28 days	Biodegradable polymer PLGA	I
BioMatrix	120 µm	Stainless steel platform	Biolimus	6 months	Polylactic acid albumin-L polymer that is degradable	9 months
BioFreedom	120 µm	Stainless steel, a polymer-free and carrier-free Biolimus drug-coated stent	Biolimus	90% of drug within 48 h	Polymer-free and carrier-free drug-coated stent. The stent transfers umirolimus (also known as biolimus A9), a highly lipo-philic sirolimus analogue (15.6 μ g/mm ²) into the vessel wall over a period of 1 month	1
Supraflex	60 µm	L605 cobalt–chromium	Sirolimus	48 days	Biodegradable polymeric matrix coating (poly L-lactide, 50:50 mixture poly DL-lac- tide-co-glycolide and polyvinyl pyrrolidone)	9–12 months
Resolute Onyx 81/91 µm 2	81/91 µm 2	Cobalt-chromium, platinum-iridium core wire	Zotarolimus	6 months	Covered with a 5.6 µm layer of the BioLinx durable polymer	I
MiStent	64 µm	Cobalt-chromium	Microcrystalline sirolimus	9 months	Biodegradable polylactic-coglycolic	90 days
Nobori	120 µm	Stainless steel and a nondegradable parylene coating between the stent and the biode- gradable polymer	Biolimus	≤ 30 days	The biodegradable polylactic acid polymer (PLLA and poly pL-lactide-co-glycolide)	6–9 months
Endeavor	91 µm	Chromium-cobalt-nickel alloy	Zotarolimus	I	Durable phosphorylcholine polymer	I

Baseline characteristics
Table 2

$ \left(\begin{array}{cccccccccccccccccccccccccccccccccccc$	Name of trial or	Age, y, mean (SD)	an (SD)	Men, <i>n</i> (%)	۱ (%)	BMI, kg/m²,	mean (SD),	DM, n (%)	HTN, <i>n</i> (%)	Dyslipidemia, <i>n</i> (%)	nia, <i>n</i> (%)	Current smoker, n (%)		Previous MI, n (%)		Previous PCl, <i>n</i> (%) Previous CABG, <i>n</i> (Previous CABG, <i>n</i> (%)
(b) (b) <th>registry</th> <th>_</th> <th>υ</th> <th>_</th> <th>υ</th> <th>_</th> <th>υ</th> <th>U L</th> <th>0</th> <th>_</th> <th>υ</th> <th> </th> <th>U</th> <th>0</th> <th>_</th> <th>υ</th> <th>0</th>	registry	_	υ	_	υ	_	υ	U L	0	_	υ		U	0	_	υ	0
EPID01=100 704+101 723 724	DESSOLVE- C [20]	59.55 ± 9.21	60.39±8.62	148 (68.52)			25.09±3.31	53 (24.54) 57 (26.89)) 122 (56.48) 119 (56.1	3) 29 (13.43)	26 (12.26)			.65)	5 – 6.51) –	I	0 (0%) 1 (0.47)
U210222111 G3410 G338 G1120 G326 G1120 G327 G314 G337 G314 G337 G314 G337 G314 G337 G314 G337 G314 G337 G314 G317 G317 <thg317< th=""> G317 G317</thg317<>	CASTLE [21]70.1 ± 10.4	70.4±10.1	572 (79.2)	554 (77.2)	I	I	284 (39.3) 279 (38.9		467 (64.7)				6		5 (38.1) 255/718 (35.5)	24 (3.3) 18 (2.5)
C G A ± 10.7 G A ±	SCAAR [22]	67.2 ± 11.1	67.8±10.9	3378 (74.1)	51,296 (73.7)	I	I	984 (22.1) 14,782 (21.4)	2799 (62.9) 42,283 (61.5)		33,355 (48.6)					8 (17.1) 12,370 (17.8)	367 (8.1)5879 (8.5)
661±11 666±11 775 733 775 733 775 733 775 733 775 733 732 734 734 731 733 732 743 711 703 703 713 713 713 713 713 713 713 713 714 714 712 714 717 70 00	BIODE- GRADE [23, 24]		6 3.6 ± 11.1	835 (71.6)	838 (72.2)	25.1 ± 3.3	25.1±3.3	384 (32.9) 393 (33.9		609 (52.2)	625 (53.9)	324 (27.8)				5 (11.6) 147 (12.7)	8 (0.7) 10 (0.9)
OWVB01L85 S84466 (10) (12) S61231 S87640 120 (545) 120 (545) 120 (545) 126 (545) 126 (545) 126 (545) 126 (74) 274 (45) 214 (45) 24	Sort Out IX [25, 26]		66.4±10.7	1,221 (77.3)	1,219 (77.5)	27.6±8.0	27.8±7.5	303 (19.2) 304 (19.3		777 (51.5)				5		1 (20.9) 322 (20.9)	108 (7.0) 130 (8.4)
M 622(118) 533(79) 477(73) 568(43) 73(11% 82(13%) 213(71) 320/643 27(48) 23(74) 24(98) 24(12) 24(12) 24(1	BIOFLOWV [27]	l159.1 ±8.5	58.4±8.6	160 (72.7)	142 (64.5)	25.3 ± 3.1	25.1±2.8		120 (54.5)		93 (42.3)	75 (34.1)		31 (14.1) 17			I
OW 688±96 644±98 280 146 - - 117 (30.4) 59 (13.1) 296 (75.9) 136 (71.6) 136 (71.6) 136 (71.6) 136 (71.6) 136 (71.6) 136 (71.6) 136 (71.6) 136 (71.6) 136 (71.6) 127.20 (73.9) 11 (53.3±10.4 (55.3±10.4 <td>BIOSTEMI [28-30]</td> <td>62·2 (11·8)</td> <td>63·2 (11·8)</td> <td>513 (7:</td> <td>9) 477 (73</td> <td>.) 26.9 (4.3)</td> <td>26.8 (4.3)</td> <td></td> <td>281 (43)</td> <td></td> <td>302/644 (47)</td> <td>294 (45)</td> <td></td> <td>27 (4%) 2[,]</td> <td>4 (4%) 29</td> <td></td> <td>2 (<1%) 8 (1)</td>	BIOSTEMI [28-30]	62·2 (11·8)	63·2 (11·8)	513 (7:	9) 477 (73	.) 26.9 (4.3)	26.8 (4.3)		281 (43)		302/644 (47)	294 (45)		27 (4%) 2 [,]	4 (4%) 29		2 (<1%) 8 (1)
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	BIOFLOW- IV [31, 32]		64.4±9.8	280 (72.2)	146 (76.8)	I	I	117 (30.4) 59 (31.1)	296 (76.9)		136 (71.6)	82 (21.3)		(6	2 (32.6) 16	9 (43.9) 88 (46.3)	I
V [36,643349] 6470 (3,12) (65,2) 610 (63) (65,2) 530 (61,3) (65,2) 23644445 2940 4,43 2940 4,33 155 (73,53) (67,31) 166(64) 164,76 174,76 141,76 141,76 141,76 141,76 141,76 141,76 137 136 137 136 137 137 137 136 137 136 136 136 137 136 137 136 136 136 137 136 137 136	TALENT [33–35]	65.3±10.4	65.3±10.4	546 (75·8)	547 (76·5)	28.3 ± 4.8	28·3±4·6	157 (21.8) 178 (24.9			428 (60·2)		172 (24·1%)	ê		5 (24·3) 153 (21·4%)	33 55 (4·6%) (7·7)
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	MeriT-V [36 37]	i,64.33 ±9.57		111 (65.29)		28.64±4.45	29.40±4.39	41 (24.12 18 (20.93) 125 (73.53) 68 (79.07		59 (68.60)			.76)		(18.24) 14 (16.28)	I
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677±118 676±12.1 1076 1064 275±4.6 27.5±4.6 27.5±4.6 27.5±4.6 27.5±4.6 27.5±4.6 27.5±7.6 218 219 317 (21.8) 327 (22.5) 327 (22.5) 327 (22.5) 327 (21.6) 327 (22.5) 327 (21.6) 327 (22.5) 327 (21.6) 327 (22.5) 327 (21.6) 327 (22.5) 327 (21.6) 327 (22.5) 327 (21.6) 327 (22.5) 327 (21.6) 327 (22.5) 327 (21.6) 327 (22.5) 327 (21.6) 327 (22.5) 327 (21.6) 327 (22.5) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (21.6) 327 (DESSOLVE III [41–43]		66.3±10.7	494 (70.3)	513 (73.8)	27.9±4.4	28.1 ± 4.5	186 (26.6) 187 (27.2		408 (61%)	393 (60%)	171 (26.6)				6 (33.7) 247 (35.6)	51 (7.3) 66 (9.5)
$ \begin{array}{rrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrrr$	CAR- DIOBASE Bern PCI Registry [44]	67.7 ±11.8	67.6±12.1	1076 (74.2)	1064 (73.3)	27.5 ±4.6	27.6±4.8	328 (22.6) 341 (23.5	1029 (70.9) 1030 (71.		971 (66.9)					7 (21.8) 327 (22.5)	149 148 (10.3) (10.2)
N 624±10.5 62.8±9.5 122 137 - - 31 (18.8) 34 (20.6) 148 (89.7) 154 (93.3) 161 (97.6) 155 (93.9) 49 (29.7) 59 (35.8) 52 (31.5) 48 (29.1) 47 (28.5) 50 (30.3) (73.9) (83.0) (73.9) (83.0) (73.9) 49 (29.7) 59 (35.8) 52 (31.5) 48 (29.1) 47 (28.5) 50 (30.3) 642±10.7 640±10.7 854 (73) 1693 274±42 27.6±42 211 (18) 413 (17.6) 550 (47) 1074 463 (40) 872 (37.18) 341 (30) 690 (29.4) 209 (18) 440 214 (18%) 412 642±10.7 640±10.7 854 (73) 1693 277±4±2 27.6±4±2 211 (18) 413 (17.6) 550 (47) 1074 463 (40) 872 (37.18) 341 (30) 690 (29.4) 209 (18) 440 214 (18%) 412 (72.19) (72.19) (72.19) (45.79) (45.79) (45.79) (45.77)	ORIENT [45 46]	,65.2±11.9	64.8±11.0	180 (72.0)	86 (70.5	5) 24.8 ± 3.5	24.5±3.1			134 (53.6)	66 (54.1)						2 (0.8) 0 (0.0)
642±10.7 640±10.7 854 (73) 1693 274±4.2 27.6±4.2 211 (18) 413 (17.6) 550 (47) 1074 463 (40) 872 (37.18) 341 (30) 690 (29.4) 209 (18) 440 214 (18%) (18.67) (72.19) (72.19) (18.67)	PRISON IV [47–49]	62.4±10.5	62.8±9.5	122 (73.9)		I	I		148 (89.7)	161 (97.6)	155 (93.9)	49 (29.7)		52 (31.5) 4{	3 (29.1) 47		6 (3.6) 11 (6.7)
	BIO- Resort [50-53]	64·2 ± 10·7	64•0 ± 10·7	854 (7.	3) 1693 (72.19)		27.6±4.2				872 (37.18)			209 (18) 4⁄2 (1	(2)	4 (18%) 412 (17.57)	I

Name of trial or	Age, y, mean (SD)	an (SD)	Ś	Men, <i>n</i> (%)		AI, kg/m²,	BMI, kg/m ² , mean (SD),	, DM, n (%)	(%)	HTN, <i>n</i> (%)	(%)	Dysl	Dyslipidemia, n (%)		Current smoker, n (%)	ioker,	Previous MI, n (%)		Previous PCI, <i>n</i> (%) Previous CABG, <i>n</i> (Cl, n (%) F	Previous CABG, <i>n</i> (%)
registry	_	υ	-	U	-		U	_	υ		υ	_	U	_		0			U	-	U
SORT OUT VII [54-57]	66.1±10.7	64.8±10.8		945 951 (74.9) (75.2)		27.5 ± 4.7	27.4±4.4	236 (1	8.7) 235 (1	236 (18.7) 235 (18.6) 713 (58.1)		699 (56.4) 711 (57.6		706 (56.4) 3	355 (29.1)	399 (32.5)	215 (17.4) (222 2 (17.8)	237 (19.0) 256 (20.4) 100 (8.0)96 (7.	56 (20.4) 1	100 (8.0)96 (7.6)
BIOFLOWV [58-61]	BIOFLOW V 64.5 ± 10.3 [58-61]	64.6±10.7		660 328 (74.67) (72.8)	2.8) -		I	300/883 (34)	33 166/449 (37)	49 696 (79.7)	9.7) 354 (80.5)	30.5) 695/881 (79)		'449	209 (23.6) 102 (22.7)	102 (22.7)	238 (27.4) (115 3 (25.9) (323/877 1 ² (37) (3	147/445 € (33)	62 (7.1) 23 (5)
ய	65.0 ± 10.4	65.1±10.5		85 (69.1) 45 (73.8) –	(73.8) -		I	23 (19%)	%) 12 (19.7)		87 (70.5%) 42 (68.9)	3.9) 90 (72.7)		50 (81.7) 20	26 (21.5)	15 (25.4)	28 (23.1)	28 (23.1) 10 (16.4) 39 (30.9)		14 (22.9) 5	5 (4.1%) 2 (3.3)
BIOFLOW-II [65, 66]	BIOFLOW-II 62.7 ± 10.4 [65, 66]	64.8±9.2		5	115 – (74.7)		I	84 (28.2)	.2) 44 (28.6)	.6) 231 (77.5)	(.5) 119 (77.3)	7.3) 202 (67.8)		113 (20.1) -		I	90 (30.2) 31 (20	.13)	128 (43.0) 55 (35.7)		1
Biosci- Ence [67-69]	66·1 (11·6)	65-9 (11-4)		ê	~	27.8 (4 [.] 5)	27.5 (4.5)	257 (2	4.2) 229 (2	257 (24.2) 229 (21.7) 728 (68.5)	5) 706 (6	706 (66.9) 712 (67.0)	(67.0) 716	716 (67.8) 30	309 (29.1) 300 (28.5)	300 (28-5)	223 (21·0) (0	204 3 (19.3)	325 (30·6) 292 (27·7) 113 (10·	92 (27·7) 1)	113 98 (10-6) (9-3)
4	Clinical diagnosis for percutaneous coronary l, n (%)	nosis for	percuta	neous co	ronary l	(%) u					Target le	Target lesion per patient, n (%)	patient, <i>n</i>	(%)							Follow-up
trial or registry 5	Silent ischemia		Stable angina	gina	Unstab	Unstable angina	Non-STEMI	IW	STEMI		-		7		m		~		Number per patient	er per t	1
. –	υ	<u> </u>		U	_	υ	_	υ	_	υ	_	υ	_	υ	_	υ	_	υ	_	υ	1
DES- SOLVE-C [20]	1 (0.46) 1 (0	1 (0.47) 27	7 (12.50) .	27 (12.50) 22 (10.38) 141 (65.) 141 (65.28)	146 (68.87)	I	I	I	I	I	I	I	I	I	I	T	1	1.39±0	1.39±0.50 1.30 ±0.46	1 year
TLE	181 (24.9) 177 (24.7) 389 (53.9) 399 (55.6) 30 (4.2)	7 (24.7) 38	39 (53.9) .	399 (55.6)	1 30 (4.2)	38 (5.3)	30 (4.2)	25 (3.5)	45 (6.2)	38 (5.3)	I	I	I	I	I	I	I	I	I	I	1 year
SCAAR -	1	36	932 (20:4) 14,493 (20:8)	14,493 (20.8)	442 (9.7	442 (9.7) 6864 (9.9) 1765 (38.7)	.9) 1765 (38.7)	27,590 (39.7)	1300 (28.5)	18,514 (26.6)	3012 (6)	39,147 (56.3)	1096 (24.0)	18,610 (26.8)	345 (7.6)	5) 7362 (10.6)	108 (2 <i>.</i>	4) 4451 (108 (2.4) 4451 (6.4) 261 (5.7)		65,021 1 and 2 (93.5) years
BIODE-5 GRADE [23, 24]	55 (4.7) 65 (65 (5.6) 32	28 (28.1)	313 (27.0)) 424 (36.	4) 424 (36	328 (28.1) 313 (27.0) 424 (36.4) 424 (36.6) 238 (20.4) 257 (22.2) 121 (10.4) 101 (8.7)	l) 257 (22.	2) 121 (10.	4) 101 (8.7)		854 (73.2) 848 (73.1) 246 (21.1) 236 (20.3)) 246 (21.	1) 236 (20	.3) 62 (5.3)	61 (5.3)	8 (0.7)	14 (1.2)	() 1.3	1.3	18 months and 3 years
SORT - OUT IX [25, 26]	1	ð	45 (40.8)	645 (40.8) 671 (42.7) 453 (28.7)) 453 (28.	- (2	I	454 (28.	9) 397 (25.	454 (28.9) 397 (25.1) 367 (23.3) 1196 (75.7)	() 1196 (75.7)	1209 (76.9)	311 (19.	7) 282 (17	311 (19.7) 282 (17.9) 59 (3.7)	67 (4.3)	13 (0.8)	14 (0.9)	() 1.3 (0.6)	1.3 (0.6)	1 and 2 years
BIOFLOW - VI [27]	1	I		1	161 (73.	161 (73.2) 184 (83.6)	- (9:	I	I	I	186 (84.5	186 (84.5) 189 (85.9) 34 (15.5)	9) 34 (15.5)) 31 (14.1)	- ()	I	I	I	1.15 (0.36)	36) 1.14 (31)	1 Year
BIOSTEMI - [28-30]	1	I			I	I	I	I	I	I	516 (80)	523 (80)	103 (16)	103 (16)) 23 (4%)) 23 (4%)	6 (1%)	2 (<1%)	%) 649	651	1, 2, and 5 Years
BIOFLOW IV [31, 32]	1	I		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	1 and 5 years
TALENT -	I	25	91 (40-4) .	310 (43-4)) 116 (16 [.]	291 (40.4) 310 (43.4) 116 (16.1) 99 (13.8)) 189 (26-	4) 119 (16 [.]	194 (26.9) 189 (26.4) 119 (16.5) 117 (16.4)	- (I	I	I	I	I	I	I	I	I	1 and 5 vears

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Vame of	Name of Clinical diagnosis for percutaneous coronary l, n (%)	osis for per	utaneous c	oronary l, .	(%) u					Target le	sion per p	Target lesion per patient, <i>n</i> (%)	(9,						ይ	Follow-up
trial or registry	Silent ischemia		Stable angina	Unstable	Unstable angina	Non-STEMI	W	STEMI		-		2	m	~	^	~	Nu pat	Number per patient	L	
	U _	_	υ	_	υ	_	U	_	υ	_	U	_	- -	U		U				
MeriT–V [36, 37]	16 (9.41) 5 (5.81)	81) 116 (68.24)		61 (70.9) 25 (14.71) 12 (13.95) 10 (5.88)) 12 (13.95) 10 (5.88)	8 (9.30)	3 (1.76)	0 (0:0)	144 (84.71)	73 (84.88)) 25 (14.71)	73 (84.88) 25 (14.71) 12 (13.95) 1 (0.59)		1 (1.16) –		170		86 1, 2 yea	1, 2, and 3 years
BIONYX 3-year [38–40]	360 (28·9) –	I	363 (29	363 (29-2) 236 (19-0) 254 (20-4))) 254 (204	l) 310 (24·9)	310 (24:9) 344 (27.7) 339 (27.2) 282 (22.7)	339 (27·2)	282 (22·7)	I	I	I	I	I	I	I	I	I		1 and 2 years
DESSOLVE - III [41-43]		289 (4	289 (41.1) 287 (41.3) 162 (23) 166 (23.9) 149 (21.2) 133 (19.1) 103 (14.7) 109 (15.7) -	3) 162 (23)	166 (23.9	(21.2) (149	(133 (19.1)	103 (14.7)	109 (15.7)	I	I	I	1	1	I	I	I	I		1,2, and 3 years
CAR- DIOBASE Bern PCI Registry [44]	I	672 (46.3%)	672 (46.3%)		76 (5.2%) 76 (5.2%)) 382 (26.3)	321 (22.1)	321 (22.1)	799 (55.1)) 824 (56.8)) 429 (29.6)	382 (26.3) 382 (26.3) 321 (22.1) 321 (22.1) 799 (55.1) 824 (56.8) 429 (29.6) 411 (28.3) 223 (15.4)	223 (15.4)		2	216 (14.9) -	I	1, . , Yei	1, 2, and 3 years
ORIENT [45, 46]	1	136 (5	136 (53.3) 70 (55.1) 62 (24.3) 25 (19.7)) 62 (24.3)	25 (19.7)		33 (12.9) 21 (16.5)	24 (9.4)	11 (8.7)	I	I	I	1	1	I	I	I	I		1 year
PRISON IV [47–49]	1	115 (6	115 (69.7) 115 (69.7 10 (6.1)	7 10 (6.1)	12 (7.3)	I	I	I	I	105 (64.5)	108 (65.5)	105 (64.5) 108 (65.5) 50 (30.3) 46 (27.9)		10 (6.1) 1	11 (6.7) -	I	165		165 1,2 yea	1,2, and 3 years
BIO- RESORT [50–53]	I	351 (3	351 (30%) 714 (30.45)	209 (18%	6) 411 (17.5	209 (18%) 411 (17.5) 239 (20%) 517 (22.) 517 (22.05)	370 (32%) 703 (29.9	1 703 (29.98)	I	I	I	1	1	I	I	I	I	yea	1, 3, and 5 years
SORT OUT VII [54-57]	I	559 (4	559 (44.3) 555 (43.9) 388 (30.7)	9) 388 (30.7	6		412 (32.6)	268 (21.2)	262 (20.7)	978 (77.6)	995 (78.7,) 240 (19.0)	412 (32.6) 268 (21.2) 262 (20.7) 978 (77.6) 995 (78.7) 240 (19.0) 215 (17.0) 41 (3.3)		46 (3.6) 2	2 (0.2) 7 .	7 (0.6) 1.3	1.3 (0.5) 1. (C	1.3 1,2 (0.5) and	1,2,3,4, and 5 years
BIOFLOW 109, V [58-61] (12)	BIOFLOW 109/884 61/449 V [58-61] (12) (14)		428 (48.4) 213 (47.7) 347 (39.3) 175 (39)	7) 347 (39.3	3) 175 (39)	I	I	I	I								1.2	1.2 (0.4) 1. (0	1.3 1,2 (0.5) yeã	1,2,3, and 5 years
DESSOLVE – I and II [62–64]	1	96 (78	96 (78%) 49 (80%)) 18 (14.6)	8 (13.3%)	1	I	I	I	I	I	I	1	1	I	I	I	I	9 r 2, 5	9 months, 2, and 5 years
BIO- FLOW-II [65, 66]	68 (22.6) 39 (24.7) 173 (57.9) 92 (59.7) 59 (19.5) 25 (15.6)	24.7) 173 (5	7.9) 92 (59.7) 59 (19.5)	25 (15.6)	I	I	I	I	I	I	I.	1	1	I	I	I	I		1 and 5 years
BIOSCI- ENCE 167-691	161 171 (15·1%) (16·2%)	325 :%) (30·6%)	331 (31·3%)	78 (7.3%	78 (7·3% 74 (7%)	288 (27·1%)	284 (26.9)	211 (19.9)	196 (18-6)	683 (64·3)	688 (65-2)) 266 (25-0)	284 (26-9) 211 (19-9) 196 (18-6) 683 (64-3) 688 (65-2) 266 (25-0) 267 (25-3) 84 (7-9)		6 (8.1%) 3.	0 (2.8%) 1 <u>'</u>	86 (8.1%) 30 (2.8%) 15 (1.4%) 1594		1545 1, 2 Yea	1, 2, and 5 Years

Data presented as mean and SD, or number (%)

Intervention (I), control (C)

BMI Body mass index, CABG coronary artery bypass graft, DM diabetes mellitus, HTN hypertension, MI myocardial infarction, PCI percutaneous coronary intervention, STEMI ST-segment elevation myocardial infarction

ition procedure
tervention
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characterist
3 Lesion o
Table

Name of	Target ves:	Target vessel location, n (%)	1 (%)				-	Lesion type, <i>n</i> (%)	e, n (%)										
registry	Left main artery	Left anterior descending	rior ing	Left circumflex artery	mflex	Right coronary artery	nary A		81		82	U		Chr. occl	Chronic total occlusion	Bifurcation lesion		Direct stenting	ting
	U -	_	υ	_	υ	_	0	υ	_	υ	-	_	υ	_ 	υ	 	υ	_	0
DESSOLVE-C [20]	0 (0%) 0 (0	DESSOLVE-C 0 (0%) 0 (0%) 137 (47.24) 126 [20] (45.5	4) 126 (45.99)	50 (17.24) 46 (16.7	46 (16.79)	1		I	I	I	I	I	I	I	I	I	I		
CASTLE [21]	I I	449/845 (53.1)	458/841 (54.5)	129/845 (15.3)	147/841 (17.5)	269/845 (31.8)	236/841 - (28.1)	I	I	I	625/811 - (77.1)	I	615/8 (75.8)	615/811 – (75.8)	I	267/845 (31.6)	269/841 (32.0)	I	I
SCAAR [22]	117 3821 (2.6) (5.5)	21 2333 (51.2) 37,307 (53.6)	2) 37,307 (53.6)	1264 (27.7) 20,206 (29.0)	7) 20,206 (29.0)	1480 (32.5) 22,799 (32.8)	22,799 – (32.8)	I	I	I	2993 – (65.6)	I	42,860 (61.6)	60 229 (5) 5)	(5) 3729 (5.4)	868 (19)	13,031 (18.7)	1019 (22.4) 17,860 (25.7)	17,860 (25.7)
BIODEGRADE 43 (2.8) [23, 24]	E 43 (2.8) 57 (57 (3.8) 733 (48.2)	775 (51.3	775 (51.3) 340 (22.4)	345 (22.	9) 441 (29.0)	386 (25.6) 118 (7.8)		106 (7.0) 413 (27.2)	395 (26.2)	389 (25.6) 385 (25. <u>5</u>	6	(6	(41.3) 93 (£	624 (41.3) 93 (6.1) 72 (4.8)	321 (15.2)	219 (14.5)	219 (14.5) 172 (11.3)	174 (11.5)
SORT OUT IX [25, 26]	. 44 (2.2) 49 (SORT OUT IX 44 (2.2) 49 (2.5) 856 (43.0) [25, 26]		845 (43.0) 445 (22.4)	465 (23.7)	621 (31.3)	589 (30.0) 216 (10.9	216 211 (10.9) (10.8)	612 8) (31.0)	561 (28.6)	503 (25.5) 526 (26.8	()		(33.8) 81 (2	662 (33.8) 81 (4.1) 100 (5.1)407 (20.6)	1)407 (20.6)	368 (18.8) 194 (9.8)		160 (8.2)
BIOFLOW VI [27]	(0) 0 (0) 0)) 127 (50)	135 (53.8	135 (53.8) 51 (20.1)	46 (18.3)	74 (29.1)	69 (27.5) -	I	I	I	196 (77.5) –	I	198	198 (78.9) –	I	45 (17.8)	47 (18.7)	I	I
BIOSTEMI [28-30]	10 (1%) 9 (1)	() 316 (39)	357 (44)	357 (44) 143 (18)	137 (17)	346 (42)	302 (37) -	I	I	I	I I	I	I	1 (<	1 (< 1%) 3 (< 1%) 101 (12)	(12) (12)	115 (14)	1	
BIOFLOW-IV [31, 32]	1 (0.2) 1 (C	BIOFLOW-IV 1 (0.2) 1 (0.5) 174 (39.5) 87 (40.7) 106 (24) [31, 32]	87 (40.7)	106 (24)	59 (27.6)	160 (36.3)	67 (31.3) 7 ₄ (1	74 38 ((17.3)	38 (18.2) 208 (48.7)		92 (44) 69 (16.2) 44 (21.1) 76 (17.8)35 (16.8)	4 (21.1) 76	(17.8)35 (16.8) –	I	20 (4.5)	12 (5.6)	I	I
TALENT [33–35]	15 16 ((1:4%)	16 (1·6) 468 (44·7) 432 (41·9) 220 (21·0) 237 (23·0)	, 432 (41.9) 220 (21.0)	237 (23.0)	338 (32·3)	328 (31.8) -	I	I	I	I	I	I	I	I	167 (16-0)	157 (15·2)	I	I
MeriT-V [36, 37]	I	86 (47.25)		32 (33.68) 37 (20.33)	27 (28.42)	59 (32.42)	36 (37.89) 15 (8.2	4	12 50 (12.63) (27.47)	50 25 (27.47) (26.32)	60 (32.97) 24 (25.26 57 (31	4 (25.26 57 (31	57 34 ((31.32)	34 (35.79) –	I	I	I	I	I
BIONYX 3- year [38-40]	I	54 (44.3%	54 (44.3%) 22 (36.1) 26 (21.3)	26 (21.3)	23 (37.7)	42 (34.4)	16 (26.2) 1(10 (8.2) 6 (9.8)		56 (45.9)28 (45.9)36 (29.5)	-	.2%)	20 (16.4)11 (18%)	18%) -	I	I	I	I	I
DESSOLVE III 16 [41–43] (1.5	(%	14 (1.4) 430 (41.5%)394 (39.7) 271 (26.1) 259 (26.	%)394 (39.7) 271 (26.1)	-	314 (30.3)	317 (31.9) -	I	I	I	I	I	I	I	I	77 (7%)	(%2) 69	I	I
C ARDIOBASE 57 Bern (2.4 PCI Registry [44]	(%t	59 (2.5) 1031 (42.9) 1010 (42.7)	9) 1010 (42.7)	581 (24.1)	581 (2.4.1) 574 (24.2) 679 (28.2)		664 (28.0) -	I	I	I	1	I	I	I	I	341 (14.2%	341 (14.2%)344 (14.5) 704 (30.6)	704 (30.6)	671 (29.7)
ORIENT [45, 46]		20 (5.8) 5 (2.8) 158 (45.8)) 85 (48.3)	93 (27.0)	36 (20.5)	74 (21.4)	50 (28.4) -	I	I	I	I	I	I	31 (5	31 (9.0) 11 (6.3) 79 (22.9)	79 (22.9)	42 (23.9)	I	I
PRISON IV [47–49]	I	48 (29.1)	50 (30.3)	I	I	94 (57.0)	87 (52.7) –	I	I	I	I	I	I	I	I	I	I	I	I
BIO-RESORT [50-53]	23 (2%) 53 (23 (2%) 53 (1.7) 679 (44%) 1204 (38.66) 1204 (38.68)	338 (22%)	753 (24.19)	485 (31%)	1045 7. (33.58)	75 (5%) 150 (4.8) 332 (22 ⁹	1 (4.8) 332 (22%)	731 (23.5)	624 (40) 12 (3)	1202 514 (38.6) (339	514 1017 (33%) (32.68)		52 (3%) 99 (3.18)443 (29)	3)443 (29)	884 (28.4) -		

Name of	Target v	essel loc	Target vessel location, n (%)	(%					Lesion t	Lesion type, <i>n</i> (%)	(9)										
trial or registry	Left mai artery	¢ ت ي	Left main Left anterior artery descending		Left circumflex artery	mflex	Right coronary artery	onary	A		18	82	~	U		Chro occlu	Chronic total occlusion	Chronic total Bifurcation lesion Direct stenting occlusion	on lesion	Direct	stenting
		-	- - -	U	_	υ	_	υ		- -	0		U	_ 	υ	_ 	υ	 	υ	_	υ
SORT OUT V [54-57]	VII 18 (1.1)	12 (0.8) 6	86 (43.1)	672 (42.3)	338 (21.3)	349 (22.C	SORT OUT VII 18 (1.1) 12 (0.8) 686 (43.1) 672 (42.3) 338 (21.3) 349 (22.0) 526 (33.1) 536 (33.8) 217 203 [54-57] (12.8)	536 (33.8)) 217 203 (13.6) (12.8)		470 493 (29.6) (31.0)		358 (22.5) 343 (21.6)	545 .6) (34.3)		34.6) 63 (4.	0) 65 (4.2	() 192 (12.3)) 198 (12.	.7) 221 (1-	549 (34.6) 63 (4.0) 65 (4.2) 192 (12.3) 198 (12.7) 221 (14.5) 211 (13.7)
BIOFLOWV [58-61]	1	4, 2	431/1051 (41) (231/561 (41)	431/1051 231/561 279/1051 146/561 (41) (41) (27) (26)	146/561 (26)	341/1051 184/561 (32) (33)	184/561 (33)		1	1	I	I	I	I.	I	I.	156/1051 (15)	156/1051 84/561 (15) (15)	I	I
DESSOLVE I – and II [62–64]	_ <u>₹</u>	ĿĊ.	5 (44.3)	23 (61)	55 (44.3) 23 (61) 27 (21.3) 23 (37.7	23 (37.7)	43 (34.4) 16 (26.2) 8.2	16 (26.2)		9.8	45.9 4	45.9 29.5	.5 26.2	2 16.4	18	I	I.	I	I.	I	I
BIOFLOW-I [65, 66]	1 (0.30) () (0.00) 1.	48 (44.71)	69 (39.88)	73 (22.05)	55 (31.79	BIOFLOW-II 1 (0.30) 0 (0.00) 148 (44.71) 69 (39.88) 73 (22.05) 55 (31.79) 109 (32.93) 49 (28.32) - [65, 66]) 49 (28.32)		1	1	I	I	I	I.	I	I.	I	I.	I	I
BIOSCIENCE [67-69]	E 29 (1·8) 2	28 (1.7) 6	49 (40.7)	679 (43.9)	370 (23·2)	341 (22·1	BIOSCIENCE 29 (1-8) 28 (1.7) 649 (40-7) 679 (43-9) 370 (23-2) 341 (22-1) 505 (31-7) 452 (29-3) - [67-69]	452 (29.3)				I	I	I	I	278 (17·5)	253 (16-4)) 260 (16-	.9) 428/15 (28·2)	262 (16-5) 260 (16-9) 428/1517 439/1483 (28-2) (29-6)

Table 3 (continued)

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Data presented as number (%) Intervention (I), control (C)

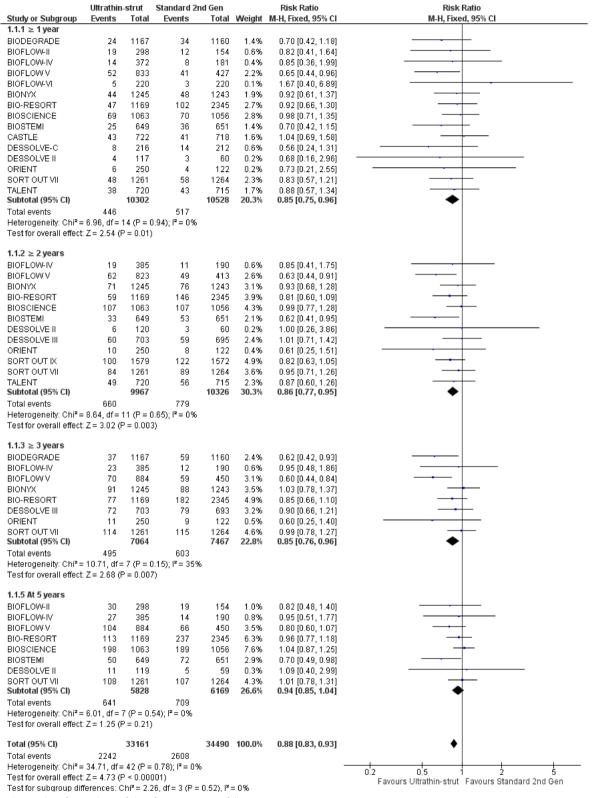


Fig. 3 Forest plot of target lesion failure from 1 to 5 years follow-up

Study or Subgroup	Ultrathin Events	Total	Standard 2n Events		Weight	Risk Ratio M-H, Fixed, 95% Cl	Risk Ratio M-H, Fixed, 95% Cl
1.3.1 ≥ 1 year							
BIODEGRADE	12	1167	16	1160	2.1%	0.75 [0.35, 1.57]	
BIOFLOW-II	2	298	1	154	0.2%	1.03 [0.09, 11.31]	
BIOFLOW-IV	Õ	372	1	181	0.3%	0.16 [0.01, 3.97]	·
BIOFLOWV	1	831	3	425	0.5%	0.17 [0.02, 1.63]	
BIOFLOW-VI	1	220	0	220	0.1%	3.00 [0.12, 73.24]	
BIONYX	13	1245	7	1243	0.9%	1.85 [0.74, 4.63]	
BIO-RESORT	10	1169	20	2345	1.7%	1.00 [0.47, 2.14]	
BIOSCIENCE	20	1063	22	1056	2.9%	0.90 [0.50, 1.64]	
BIOSTEMI	18	649	19	651	2.5%	0.95 [0.50, 1.79]	
CASTLE	6	722	7	718	0.9%	0.85 [0.29, 2.52]	
DESSOLVE-C	1	216	2	212	0.3%	0.49 [0.04, 5.37]	
DESSOLVE II	2	117	2	60	0.3%	0.51 [0.07, 3.55]	
DESSOLVE III	14	703	11	695	1.4%	1.26 [0.58, 2.75]	
					1.470		
meriT-V	0	168	0	84		Not estimable	
ORIENT	3	250	1	122	0.2%	1.46 [0.15, 13.93]	
PRISON IV	1	165	2	165	0.3%	0.50 [0.05, 5.46]	
SORT OUT IX	29	1579	16	1572	2.1%	1.80 [0.98, 3.31]	
SORT OUT VII	16	1261	18	1264	2.4%	0.89 [0.46, 1.74]	
TALENT	7	720	2	715	0.3%	3.48 [0.72, 16.67]	
Yamaji et al. 2018 (CARDIOBASE)	33	1451	43	1451	5.6%	0.77 [0.49, 1.20]	
Subtotal (95% CI)		14366		14493	24.9%	1.00 [0.82, 1.22]	♦
Total events	189		193				
Heterogeneity: Chi² = 15.70, df = 18 Test for overall effect: Z = 0.00 (P = 1	(P = 0.61);	I² = 0%	100				
1.3.2 ≥ 2 years							
BIOFLOW-IV	2	385	1	190	0.2%	0.99 [0.09, 10.82]	
BIOFLOWV	5	817	2	407	0.3%	1.25 [0.24, 6.39]	
BIONYX	20	1245	12	1243	1.6%	1.66 [0.82, 3.39]	+
BIO-RESORT	15	1169	34	2345	3.0%	0.88 [0.48, 1.62]	
BIOSCIENCE	33	1063	33	1056	4.3%	0.99 [0.62, 1.60]	
BIOSTEMI	19	649	21	651	2.7%	0.91 [0.49, 1.67]	
DESSOLVE II							
	2	120	1	60	0.2%	1.00 [0.09, 10.81]	
DESSOLVE III	21	703	14	695	1.8%	1.48 [0.76, 2.89]	
meriT-V	0	168	0	84		Not estimable	
ORIENT	2	250	2	122	0.4%	0.49 [0.07, 3.42]	
SORT OUT IX	41	1579	32	1572	4.2%	1.28 [0.81, 2.01]	
SORT OUT VII	29	1261	24	1264	3.1%	1.21 [0.71, 2.07]	
TALENT	9	720	11	715	1.4%	0.81 [0.34, 1.95]	
Subtotal (95% CI)		10129		10404	23.3%	1.12 [0.92, 1.37]	•
Total events Heterogeneity: Chi² = 4.80, df = 11 (F Test for overall effect: Z = 1.10 (P = 0		= 0%	187				
122 - 200000							
1.3.3 ≥ 3 years							
BIODEGRADE	21	1167	26	1160	3.4%	0.80 [0.45, 1.42]	—• -
BIOFLOW-IV	3	385	1	190	0.2%	1.48 [0.16, 14.14]	
BIOFLOWV	9	884	5	450	0.9%	0.92 [0.31, 2.72]	
	23	1245	13	1243	1.7%		<u> </u>
BIONYX						1.77 [0.90, 3.47]	
BIO-RESORT	24	1169	49	2345	4.3%	0.98 [0.61, 1.59]	
DESSOLVE III	27	703	26	693	3.4%	1.02 [0.60, 1.74]	_
meriT-V	2	250	3	122	0.5%	0.33 [0.06, 1.92]	
ORIENT	2	165	3	165	0.4%	0.67 [0.11, 3.94]	
SORTOUTVII	38	1261	33	1264	4.3%	1.15 [0.73, 1.83]	
TALENT	13	720	15	715	2.0%	0.86 [0.41, 1.80]	<u> </u>
Subtotal (95% CI)		7949		8347	21.0%	1.03 [0.83, 1.27]	◆
Total events	162		174				
Heterogeneity: Chi² = 5.68, df = 9 (P : Test for overall effect: Z = 0.24 (P = 0	= 0.77); l² =	: 0%	114				
1.3.5 At 5 years							
-	-				0.70	0.05 10 10 0.00	
BIOFLOW-II	5	298	4	154	0.7%	0.65 [0.18, 2.37]	
BIOFLOW-IV	4	385	2	190	0.4%	0.99 [0.18, 5.34]	
BIOFLOWV	21	884	8	450	1.4%	1.34 [0.60, 2.99]	
BIO-RESORT	33	1169	71	2345	6.2%	0.93 [0.62, 1.40]	+ _
BIOSCIENCE	81	1063	76	1056		1.06 [0.78, 1.43]	T
BIOSTEMI	32	649	36	651	4.7%	0.89 [0.56, 1.42]	
DESSOLVE II	5	119	2	59	0.3%	1.24 [0.25, 6.20]	
PRISON IV	5	165	7	165	0.9%	0.71 [0.23, 2.20]	
							_ <u>_</u>
SORT OUT VII	46	1261	48	1264	6.3%	0.96 [0.65, 1.43]	
Subtotal (95% CI)		5993		6334	30.8%	0.98 [0.82, 1.17]	•
Total events Heterogeneity: Chi² = 1.83, df = 8 (P⇒ Test for overall effect: Z = 0.20 (P = 0		: 0%	254				
Total (95% CI)		38437		39578	100.0%	1.03 [0.93, 1.13]	♦
Total events	781		808				
Heterogeneity: Chi ² = 29.01, df = 49 Test for overall effect: Z = 0.54 (P = 0	(P = 0.99);	I² = 0%	000				0.01 0.1 1 10 Favours Ultrathin-strut Favours Standard 2nd Gen

Fig. 4 Forest plot of cardiac death from 1 to 5 years follow-up

Study or Subgroup	Ultrathin Events	Total	Standard 2 Events		Weight	Risk Ratio M-H, Fixed, 95% Cl	Risk Ratio M-H, Fixed, 95% Cl
1.4.1 ≥ 1 year					-		
BIODEGRADE	3	1167	0	1160	0.1%	6.96 [0.36, 134.55]	
BIOFLOW-II	8	298	4	154	0.5%	1.03 [0.32, 3.38]	
BIOFLOW-IV	13	372	6	181	0.8%	1.05 [0.41, 2.73]	
BIOFLOWV	39	831	35	424	4.7%	0.57 [0.37, 0.88]	
BIOFLOW-VI	4	220	2	220	0.2%	2.00 [0.37, 10.81]	
BIONYX	18	1245	18	1243	1.8%	1.00 [0.52, 1.91]	
BIO-RESORT	26	1169	56	2345	3.7%	0.93 [0.59, 1.48]	
BIOSCIENCE	30	1063	31	1056	3.1%	0.96 [0.59, 1.58]	
BIOSTEMI	5	649	6	651	0.6%	0.84 [0.26, 2.73]	
CASTLE	31	722	28	718	2.8%	1.10 [0.67, 1.82]	
DESSOLVE-C	1	216	1	212	0.1%	0.98 [0.06, 15.59]	
DESSOLVE II	2	117	2	60	0.3%	0.51 [0.07, 3.55]	
DESSOLVE III	15	703	13	695	1.3%	1.14 [0.55, 2.38]	
SORT OUT VII	12	1261	18	1264	1.8%	0.67 [0.32, 1.38]	
TALENT	18	720	20	715	2.0%	0.89 [0.48, 1.68]	
Yamaji et al. 2018 (CARDIOBASE)	48	1451	51	1451	5.1%	0.94 [0.64, 1.39]	
Subtotal (95% Cl)	40	12204	51	12549	29.0%	0.91 [0.77, 1.07]	
Total events	273	12204	291	12040	20.070	0.51[0.17, 1.07]	•
Heterogeneity: Chi ² = 9.28, df = 15 (F Test for overall effect: Z = 1.17 (P = 0	^o = 0.86); P	² = 0%	231				
1.4.2 ≥ 2 years							
BIOFLOW-IV	14	385	7	190	0.9%	0.99 [0.41, 2.40]	
BIOFLOWV	43	816	39	410	5.2%	0.55 [0.37, 0.84]	
BIONYX	28	1245	34	1243	3.4%	0.82 [0.50, 1.35]	+ <u>+</u> -
BIO-RESORT	30	1169	68	2345	4.5%	0.88 [0.58, 1.35]	
BIOSCIENCE	42	1063	46	1056	4.6%	0.91 [0.60, 1.37]	
BIOSTEMI	10	649	13	651	1.3%	0.77 [0.34, 1.75]	
DESSOLVE II	2	120	2	60	0.3%	0.50 [0.07, 3.46]	
DESSOLVE III	19	703	16	695	1.6%	1.17 [0.61, 2.26]	
TALENT	21	720	27	715	2.7%	0.77 [0.44, 1.35]	
Subtotal (95% CI)		6870		7365	24.7%	0.81 [0.68, 0.97]	•
Total events Heterogeneity: Chi² = 5.35, df = 8 (P : Test for overall effect: Z = 2.26 (P = 0		= 0%	252				
1.4.3 ≥ 3 years							
BIODEGRADE	5	1167	2	1160	0.2%	2.49 [0.48, 12.78]	
BIOFLOW-IV	16	385	8	190	1.1%	0.99 [0.43, 2.27]	
BIOFLOWV	44	884	41	450	5.5%	0.55 [0.36, 0.82]	_ -
BIONYX	38	1245	39	1243	3.9%	0.97 [0.63, 1.51]	
BIO-RESORT	35	1169	76	2345	5.1%	0.92 [0.62, 1.37]	_ _
DESSOLVE III	22	703	17	693	1.7%	1.28 [0.68, 2.38]	
TALENT	23	720	32	715	3.2%	0.71 [0.42, 1.21]	
Subtotal (95% CI)		6273		6796	20.7%	0.85 [0.70, 1.03]	◆
Total events	183		215			• / •	
Heterogeneity: Chi ² = 8.82, df = 6 (P : Test for overall effect: Z = 1.64 (P = 0	= 0.18); l²:	= 32%					
1.4.5 At 5 years							
BIOFLOW-II	10	298	5	154	0.7%	1.03 [0.36, 2.97]	
BIOFLOW-IV	17	385	9	190	1.2%	0.93 [0.42, 2.05]	
BIOFLOWV	56	884	45	450	6.0%	0.63 [0.44, 0.92]	- - -
BIO-RESORT	50	1169	94	2345	6.3%	1.07 [0.76, 1.49]	- - -
BIOSCIENCE	62	1063	69	1056	7.0%	0.89 [0.64, 1.24]	_
BIOSTEMI	12	649	18	651	1.8%	0.67 [0.32, 1.38]	
DESSOLVE II	5	119	2	59	0.3%	1.24 [0.25, 6.20]	
SORT OUT VII	39	1261	24	1264	2.4%	1.63 [0.99, 2.69]	<u> </u>
Subtotal (95% CI)		5828		6169	25.6%	0.94 [0.79, 1.11]	
Total events	251		266				
Heterogeneity: Chi² = 10.47, df = 7 (F Test for overall effect: Z = 0.74 (P = 0	P = 0.16); P	² = 33%	200				
Total (95% CI)		31175		32879	100.0%	0.88 [0.80, 0.96]	•
Total events	916		1024				*
Heterogeneity: Chi ² = 35.43, df = 39 (2 – ∩04	1024				
Heterogeneity: Chir = 35.43, dt = 39 (Test for overall effect: Z = 2.86 (P = 0		1 = 0%					0.01 0.1 1 10 Favours Ultrathin-strut Favours Standard 2nd Gen

Fig. 5 Forest plot of target vessel-related myocardial infarction (TVMI) from 1 to 5 years follow-up

second-generation DES, while there was no significant difference between ultrathin-struts DES and standard thickness second-generation DES at ≥ 1 year (RR: 0.91

with 95% CI [0.77, 1.07], P = 0.24), at ≥ 3 years (RR: 0.85) with 95% CI [0.70, 1.03], P = 0.10), and at 5 years (RR: 0.94 with 95% CI [0.79, 1.11], *P*=0.46) (Fig. 5).

Target lesion revascularization (TLR)

Regarding the TLR, ultrathin-struts DES showed a lower incidence of TLR at ≥ 1 year (RR: 0.79 with 95% CI [0.65, 0.96], P=0.02) and at ≥ 2 years (RR: 0.79 with 95% CI [0.67, 0.94], P=0.009), compared to standard thickness second-generation DES. However, there was no significant difference between ultrathin-struts DES and standard thickness second-generation DES at ≥ 3 years (RR: 0.90 with 95% CI [0.70, 1.15], P=0.40) and at 5 years (RR: 0.98 with 95% CI [0.81, 1.17], P=0.81) (Fig. 6).

Secondary outcome

Target vessel revascularization (TVR)

The incidence of TVR was lower in ultrathin-struts DES TVR at ≥ 1 year (RR: 0.87 with 95% CI [0.77, 0.98], P=0.02), at ≥ 2 years (RR: 0.85 with 95% CI [0.76, 0.95], P=0.005), and at ≥ 3 years (RR: 0.86 with 95% CI [0.76, 0.97], P=0.01) compared to standard thickness second-generation DES. There was no significant difference between ultrathin-struts DES and standard thickness second-generation DES at 5 years (RR: 0.96 with 95% CI [0.85, 1.08], P=0.51) (Fig. 7).

There were no significant differences between ultrathin-strut DES and standard thickness second-generation DES regarding all-cause mortality (Fig. 8), patient-oriented composite endpoint (POCE) (Figure S16), myocardial infarction (MI) (Figure S18), repeat revascularization (Figure S22), definite or probable stent thrombosis (ST) (Figure S24), definite stent thrombosis (ST) (Figure S27), probable stent thrombosis (ST) (Figure S29), and bleeding (Figure S30) at 1 year, \geq 2 years, \geq 3 years, and 5 years.

The details of primary and secondary outcome results are presented in Table 4.

TLF subgroup analysis regarding ACS versus CCS patients, there was no significant difference between ultrathin-struts DES and standard thickness second-generation DES at 1 year, 2 years, 3 years, and 5 years follow-up (*P* values for the subgroup analysis were 0.48, 0.97, 0.32, 0.63 consecutively) (Figures S31A–S31D).

More details about heterogeneity and sensitivity analysis are provided in the supplementary material.

Discussion

In this systematic review and meta-analysis, which included 103,101 patients from 21 studies with 1- to 5-year follow-ups, we compared the safety and efficacy of ultrathin-struts DES to standard thickness second-generation DES, and we elucidated that

1. ultrathin struts have a lower incidence of TLF after 1, 2, and 3 years. Nevertheless, this benefit fades 5 years, with no noticeable difference.

- 2. At 1 and 2 years, ultrathin-struts DES showed a considerably decreased incidence of TLR compared to standard thickness second-generation DES. However, there is no significant difference in TLR between the two types of stents after 3 and 5 years.
- 3. No significant difference was noted between the two groups in terms of all secondary outcomes, except for TVR. The occurrence of TVR was lower in the ultrathin group during the initial 3-year period when compared with the group using thicker DES; nevertheless, this discrepancy disappeared at 5 years.

Effect on outcomes components

One of the important components of the primary clinical outcomes is the TLF, which includes restenosis, thrombosis, and revascularization in the treated artery.

In our study, an ultrathin stent was associated with a lower incidence of TLF at 1, 2, 3 years, which could represent an early advantage and may be related to the short and intermediate-term effect of the ultrathin strut's stents. On the other hand, at 5 years, the difference in TLF between the two types of stents was not noticeable, raising concerns about the long-term durability.

The positive effect of ultrathin stent in reducing the short and intermediate-term TLF may be attributable to the stent design. Ultrathin-struts DES have a unique design that differentiates them from the standardthickness second-generation DES. The ultrathin strut design, measuring 60 µm, outperforms existing stents like XIENCE (81 µm) (Abbott Vascular, Santa Clara, CA) and RESOLUTE (91 µm) (Medtronic, Santa Rosa, CA, USA) in terms of flexibility and deliverability. This design reduces endothelial trauma, promoting excellent endothelial coverage and decreasing perivascular inflammation, resulting in a healthier vascular environment [70]. The ultrathin-strut DES evaluated in this meta-analysis has a similar metallic stent platform strut thickness and uses biodegradable polymers. They differ, however, in some elements of DES design, such as stent platform geometry, polymer composition, distribution or degradation time, and the kinetics of the antiproliferative medication delivered [12, 70]. Furthermore, characteristics inherent in the design, such as stent conformability and deliverability, can influence clinical outcomes in individuals with acute coronary syndromes (ACS), which offer a higher long-term sensitivity to stent-related adverse events. This is principally due to an enhanced prothrombotic and inflammatory response following the insertion of DES, leading to a delay in the healing process in the artery region where the stent is present [71]. Furthermore, the ultrathin design reduces side branch coverage even further, especially in vessels less than 3 mm in

Study or Subgroup	Ultrathin Events	Total	Standard 2 Events		Weight	Risk Ratio M-H, Random, 95% Cl	Risk Ratio M-H, Random, 95% Cl
1.6.1 ≥ 1 year							
BIODEGRADE	10	1167	18	1160	1.3%	0.55 [0.26, 1.19]	
BIOFLOW-II	11	298	8	154	1.0%	0.71 [0.29, 1.73]	
BIOFLOW-IV	6	372	1	181	0.2%	2.92 [0.35, 24.07]	
BIOFLOWV	17	832	10	422	1.3%	0.86 [0.40, 1.87]	
BIOFLOW-VI	0	220	1	220	0.1%	0.33 [0.01, 8.14]	
BIONYX	24	1245	31	1243	2.1%	0.77 [0.46, 1.31]	
BIO-RESORT	18	1169	34	2345	2.0%	1.06 [0.60, 1.87]	
BIOSCIENCE	41	1063	32	1056	2.5%	1.27 [0.81, 2.00]	
BIOSTEMI	11	649	19	651	1.4%	0.58 [0.28, 1.21]	
Buccheri et al. 2021 (SCAAR)	40	4561	974	69570	3.4%	0.63 [0.46, 0.86]	
CASTLE	6	722	10	718	0.8%	0.60 [0.22, 1.63]	
DESSOLVE II	2	117	2	60	0.3%	0.51 [0.07, 3.55]	
DESSOLVE III	23	703	28	695	2.1%	0.81 [0.47, 1.40]	
meriT-V	4	168	2	84	0.3%	1.00 [0.19, 5.35]	
ORIENT	3	250	3	122	0.4%	0.49 [0.10, 2.38]	
PRISON IV	16	165	6	165	1.0%	2.67 [1.07, 6.65]	
SORT OUT IX	20	1579	55	1572	2.2%	0.36 [0.22, 0.60]	(
SORT OUT VII	25	1261	37	1264	2.3%		
						0.68 [0.41, 1.12]	
TALENT	25	720	30	715	2.2%	0.83 [0.49, 1.39]	
Yamaji et al. 2018 (CARDIOBASE)	40	1451	36	1451	2.6%	1.11 [0.71, 1.73]	
Subtotal (95% CI)		18712		83848	29.3%	0.79 [0.65, 0.96]	◆
Total events	342		1337				•
		0 00 0					
Heterogeneity: Tau ² = 0.06; Chi ² = 3		9 (P = 0.0	up); if = 37%)			
Test for overall effect: Z = 2.40 (P = 0	0.02)						
1.6.2 ≥ 2 years							
	40	205		400	0.00	3 4 3 10 04 40 421	
BIOFLOW-IV	19	385	3	190	0.6%	3.13 [0.94, 10.43]	
BIOFLOWV	21	816	20	407	1.8%	0.52 [0.29, 0.95]	
BIONYX	41	1245	48	1243	2.8%	0.85 [0.57, 1.28]	-+
BIO-RESORT	25	1169	61	2345	2.5%	0.82 [0.52, 1.30]	<u> </u>
BIOSCIENCE	64	1063	58	1056	3.2%	1.10 [0.78, 1.55]	
BIOSTEMI	18	649	34	651	2.0%	0.53 [0.30, 0.93]	
Buccheri et al. 2021 (SCAAR)	69	4561	1538	69570	4.0%	0.68 [0.54, 0.87]	
DESSOLVE II	2	120	1	60	0.2%	1.00 [0.09, 10.81]	
DESSOLVE III	35	703	41	695	2.6%	0.84 [0.54, 1.31]	
meriT-V	10	168	3	84	0.6%	1.67 [0.47, 5.90]	
ORIENT	8	250	6	122	0.8%	0.65 [0.23, 1.83]	
SORT OUT IX	41	1579	80	1572	3.0%	0.51 [0.35, 0.74]	
SORT OUT VII	46	1261	57	1264	3.0%	0.81 [0.55, 1.18]	+
TALENT	43	720	40	715	2.7%	1.07 [0.70, 1.62]	
Subtotal (95% CI)		14689		79974	29.7%	0.79 [0.67, 0.94]	
	442		1000		Lon /		•
Total events	442		1990				
			201117 - 4 200				
Heterogeneity: Tau ² = 0.04; Chi ² = 2 Test for overall effect: 7 = 2.62 (P = 1		3 (P = 0.1	05); I² = 43%)			
Test for overall effect: Z = 2.62 (P = 0		3 (P = 0.1	05); I² = 43%)			
Test for overall effect: Z = 2.62 (P = 0		3 (P = 0.1)5); I² = 43%)			
Test for overall effect: Z = 2.62 (P = 0 1.6.3 ≥ 3 years	0.009)				1 0.00	0.54.00.04.00.000	
Test for overall effect: Z = 2.62 (P = (1.6.3 ≥ 3 years BIODEGRADE	0.009) 18	1167	33	1160	1.9%	0.54 [0.31, 0.96]	
Test for overall effect: Z = 2.62 (P = 1 1.6.3 ≥ 3 years BIODEGRADE BIOFLOW-IV	0.009) 18 25	1167 385	33	1160 190	0.6%	4.11 [1.26, 13.45]	
Test for overall effect: Z = 2.62 (P = 1 1.6.3 ≥ 3 years BIODEGRADE BIOFLOW-IV	0.009) 18	1167	33	1160			
Test for overall effect: Z = 2.62 (P = 1 1.6.3 ≥ 3 years BIOEEGRADE BIOFLOW-IV BIOFLOW V	0.009) 18 25	1167 385 884	33	1160 190 450	0.6% 2.2%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82]	
Test for overall effect: Z = 2.62 (P = 1 1.6.3 ≥ 3 years BIOEGRADE BIOFLOW-IV BIOFLOW V BIOFLOW V	0.009) 18 25 27 55	1167 385 884 1245	33 3 28 57	1160 190 450 1243	0.6% 2.2% 3.1%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38]	
Test for overall effect: Z = 2.62 (P = 1 1.6.3 ≥ 3 years BIODEGRADE BIOFLOW IV BIOFLOW V BIONYX BIO-RESORT	0.009) 18 25 27 55 33	1167 385 884 1245 1169	33 3 28 57 80	1160 190 450 1243 2345	0.6% 2.2% 3.1% 2.8%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23]	
Test for overall effect: Z = 2.62 (P = 1 1.6.3 ≥ 3 years BIODEGRADE BIOFLOW-IV BIOFLOW V BIONYX BIO-RESORT DESSOLVE III	0.009) 18 25 27 55 33 41	1167 385 884 1245 1169 703	33 3 28 57 80 49	1160 190 450 1243 2345 693	0.6% 2.2% 3.1% 2.8% 2.8%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23]	
Test for overall effect: Z = 2.62 (P = 1 1.6.3 ≥ 3 years BIODEGRADE BIOFLOW-IV BIOFLOW V BIOFLOW V BIOFLOW V BIOFLOSORT DESSOL/VE III ORIENT	0.009) 18 25 27 55 33 41 9	1167 385 884 1245 1169 703 250	33 3 28 57 80 49 6	1160 190 450 1243 2345 693 122	0.6% 2.2% 3.1% 2.8% 2.8% 0.8%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01]	
Test for overall effect: Z = 2.62 (P = 1 1.6.3 ≥ 3 years BIODEGRADE BIOFLOW-IV BIOFLOW V BIONYX BIO-RESORT DESSOLVE III	0.009) 18 25 27 55 33 41	1167 385 884 1245 1169 703	33 3 28 57 80 49	1160 190 450 1243 2345 693	0.6% 2.2% 3.1% 2.8% 2.8%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23]	
Test for overall effect: Z = 2.62 (P = 1 1.6.3 ≥ 3 years BIODEGRADE BIOFLOWIV BIOFLOW V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV	0.009) 18 25 27 55 33 41 9 19	1167 385 884 1245 1169 703 250 165	33 3 28 57 80 49 6 7	1160 190 450 1243 2345 693 122 165	0.6% 2.2% 3.1% 2.8% 2.8% 0.8% 1.1%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28]	
Test for overall effect: Z = 2.62 (P = 1 1.6.3 ≥ 3 years BIODEGRADE BIOFLOW / BIOFLOW / BIOFLOW / BIONYX BIO-RESORT DESSOL/E III ORIENT PRISON IV SORT OUT VII	0.009) 18 25 27 55 33 41 9 19 66	1167 385 884 1245 1169 703 250 165 1261	33 3 28 57 80 49 6 7 7	1160 190 450 1243 2345 693 122 165 1264	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23]	
Test for overall effect: Z = 2.62 (P = 1 1.6.3 ≥ 3 years BIOEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIOFLOW V BIOFLESORT DESSOL/VE III ORIENT PRISON IV SORT OUT VII TALENT	0.009) 18 25 27 55 33 41 9 19	1167 385 884 1245 1169 703 250 165 1261 720	33 3 28 57 80 49 6 7	1160 190 450 1243 2345 693 122 165 1264 715	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4% 2.8%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23] 0.99 [0.66, 1.43]	
Test for overall effect: Z = 2.62 (P = 1 1.6.3 ≥ 3 years BIODEGRADE BIOFLOW IV BIOFLOW V BIONYX BIONYX BIONRESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI)	0.009) 18 25 27 55 33 41 9 19 66 44	1167 385 884 1245 1169 703 250 165 1261	33 3 28 57 80 49 6 7 74 44	1160 190 450 1243 2345 693 122 165 1264	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23]	
Test for overall effect: Z = 2.62 (P = 1 1.6.3 ≥ 3 years BIODEGRADE BIOFLOW /V BIOFLOW V BIOFLOW V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events	0.009) 18 25 27 55 33 41 9 19 66 44 337	1167 385 884 1245 1169 703 250 165 1261 720 7949	33 3 28 57 80 49 6 7 74 44 381	1160 190 1243 2345 693 122 185 1264 715 8347	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4% 2.8%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23] 0.99 [0.66, 1.43]	
Test for overall effect: Z = 2.62 (P = 1 1.6.3 ≥ 3 years BIODEGRADE BIOFLOW IV BIOFLOW V BIONYX BIONYX BIONRESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI)	0.009) 18 25 27 55 33 41 9 19 66 44 337	1167 385 884 1245 1169 703 250 165 1261 720 7949	33 3 28 57 80 49 6 7 74 44 381	1160 190 1243 2345 693 122 185 1264 715 8347	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4% 2.8%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23] 0.99 [0.66, 1.43]	
Test for overall effect: Z = 2.62 (P = 0 1.6.3 ≥ 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOWV BIONYX BIO-RESORT DESSOLVE III DRIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2	0.009) 18 25 27 55 33 41 9 19 66 44 337 2.10, df= 9	1167 385 884 1245 1169 703 250 165 1261 720 7949	33 3 28 57 80 49 6 7 74 44 381	1160 190 1243 2345 693 122 185 1264 715 8347	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4% 2.8%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23] 0.99 [0.66, 1.43]	
Test for overall effect: Z = 2.62 (P = (1.6.3 ≥ 3 years BIODEGRADE BIOFLOWIV BIOFLOW V BIOFLOW V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: Z = 0.83 (P = (0.009) 18 25 27 55 33 41 9 19 66 44 337 2.10, df= 9	1167 385 884 1245 1169 703 250 165 1261 720 7949	33 3 28 57 80 49 6 7 74 44 381	1160 190 1243 2345 693 122 185 1264 715 8347	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4% 2.8%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23] 0.99 [0.66, 1.43]	
Test for overall effect: Z = 2.62 (P = 1 1.6.3 ≥ 3 years BIODEGRADE BIOPLOW-IV BIOPLOW-IV BIOPLOW-V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2	0.009) 18 25 27 55 33 41 9 19 66 44 337 2.10, df= 9	1167 385 884 1245 1169 703 250 165 1261 720 7949	33 3 28 57 80 49 6 7 74 44 381	1160 190 1243 2345 693 122 185 1264 715 8347	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4% 2.8%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23] 0.99 [0.66, 1.43]	
Test for overall effect: Z = 2.62 (P = 0 1.6.3 ≥ 3 years BIODEGRADE BIOPLOW-IV BIOPLOW-IV BIOPLOW-V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: Z = 0.83 (P = 0) 1.6.5 At 5 years	0.009) 18 25 27 55 33 41 9 19 66 44 337 12.10, df= 9 0.40)	1167 385 884 1245 1169 703 250 165 1261 720 7949 (P = 0.00	33 3 28 57 80 49 6 7 74 44 381 39); I² = 59%	1160 190 450 1243 2345 693 122 165 1264 765 8347	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4% 2.8% 21.6 %	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.56, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23] 0.99 [0.66, 1.49] 0.90 [0.70, 1.15]	
Test for overall effect: Z = 2.62 (P = 0 1.6.3 ≥ 3 years BIOEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: Z = 0.83 (P = 0 1.6.5 At 5 years BIOFLOW-II	0.009) 18 25 55 33 41 9 19 66 44 337 12.10, drf = 9 0.40) 18	1167 385 884 1245 1169 703 250 165 1261 720 7949 (P = 0.00	33 3 28 57 80 49 6 7 7 74 44 381 39); I² = 59%	1160 190 450 1243 2345 693 122 165 1264 715 8347	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4% 2.8% 21.6 %	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23] 0.99 [0.66, 1.43] 0.90 [0.70, 1.15]	
Test for overall effect: Z = 2.62 (P = (1.6.3 ≥ 3 years BIODEGRADE BIOFLOWIV BIOFLOWIV BIORESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: Z = 0.83 (P = (1.6.5 At 5 years BIOFLOW-IV	0.009) 18 25 27 55 33 41 9 19 66 44 337 (2.10, df = 9 0.40) 18 15	1167 385 884 1245 1169 703 250 165 1261 720 7949 (P = 0.00 298 385	33 3 28 57 80 49 6 7 7 4 44 381 09); (° = 59% 10 3	1160 190 450 1243 2345 693 122 165 1264 715 8347 9	0.6% 2.2% 3.1% 2.8% 2.8% 0.8% 1.1% 3.4% 2.8% 21.6 %	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.26] 0.89 [0.65, 1.23] 0.99 [0.66, 1.49] 0.90 [0.70, 1.15]	
Test for overall effect: Z = 2.62 (P = (1.6.3 ≥ 3 years BIODEGRADE BIOFLOWIV BIOFLOW V BIOFLOW V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: Z = 0.83 (P = (1.6.5 At 5 years BIOFLOW-IV BIOFLOW-IV	0.009) 18 25 27 55 33 41 9 9 9 19 66 44 337 (2.10, df= 9 0.40) 18 18 48	1167 385 884 1245 1169 703 250 1261 720 7949 (P = 0.00 298 385 884	33 3 28 57 80 49 6 7 74 44 381 381 39); I² = 59% 10 3 32	1160 190 450 1243 2345 693 122 165 1264 715 8347	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4% 2.8% 21.6%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23] 0.99 [0.66, 1.49] 0.90 [0.70, 1.15] 0.93 [0.44, 1.97] 2.47 [0.72, 8.42] 0.76 [0.50, 1.18]	
Test for overall effect: Z = 2.62 (P = (1.6.3 ≥ 3 years BIODEGRADE BIOFLOWIV BIOFLOW V BIOFLOW V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: Z = 0.83 (P = (1.6.5 At 5 years BIOFLOW-IV BIOFLOW-IV	0.009) 18 25 27 55 33 41 9 19 66 44 337 (2.10, df = 9 0.40) 18 15	1167 385 884 1245 1169 703 250 165 1261 720 7949 (P = 0.00 298 385	33 3 28 57 80 49 6 7 7 4 44 381 09); (* = 59% 10 3	1160 190 450 1243 2345 693 122 165 1264 715 8347 9	0.6% 2.2% 3.1% 2.8% 2.8% 0.8% 1.1% 3.4% 2.8% 21.6 %	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.26] 0.89 [0.65, 1.23] 0.99 [0.66, 1.49] 0.90 [0.70, 1.15]	
Test for overall effect: $Z = 2.62$ (P = 0 1.6.3 \geq 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIORESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: $Z = 0.83$ (P = 0 1.6.5 At 5 years BIOFLOW-II BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-V	0.009) 18 25 27 55 33 41 9 9 9 19 66 44 337 (2.10, df= 9 0.40) 18 18 48	1167 385 884 1245 1169 703 250 1261 720 7949 (P = 0.00 298 385 884	33 3 28 57 80 49 6 7 74 44 381 381 39); I² = 59% 10 3 32	1160 190 450 1243 2345 693 122 165 1264 715 8347	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4% 2.8% 21.6%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23] 0.99 [0.66, 1.43] 0.90 [0.70, 1.15] 0.90 [0.70, 1.15]	+
Test for overall effect: $Z = 2.62$ (P = 0 1.6.3 \geq 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIONYX BIO-RESORT DESSOLVE III DORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ^a = 0.09; Chi ^a = 2 Test for overall effect: $Z = 0.83$ (P = 0 1.6.5 At 5 years BIOFLOW-II BIOFLOW-II BIOFLOW-IV BIOFLOW-IV BIOFLOWVIV BIO-RESORT BIOSCIENCE	0.009) 18 25 37 55 33 41 9 19 66 44 337 (2.10, df= 9 0.40) 18 15 48 55 10	1167 385 884 1245 703 250 169 703 250 1261 720 7949 (P = 0.00 (P = 0.00) 298 385 884 1169 1063	33 28 27 80 49 6 7 74 44 381 381 39); ² = 59% 10 3 22 112 2106	1160 190 450 1243 2345 693 122 165 1264 765 8347 , 154 190 450 2345 1056	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4% 2.8% 24.6% 2.6% 0.6% 2.6% 3.4% 3.4%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23] 0.99 [0.66, 1.49] 0.90 [0.70, 1.15] 0.90 [0.70, 1.15] 2.47 [0.72, 8.42] 0.76 [0.50, 1.18] 0.99 [0.72, 1.35]	
Test for overall effect: $Z = 2.62$ (P = (1.6.3 \geq 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT SUBTOTAI (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: $Z = 0.83$ (P = (1.6.5 A 5 years BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-V BIOSCIENCE BIOSCIENCE BIOSTEMI	0.009) 18 25 27 55 33 41 9 9 19 66 44 337 (2.10, df = 9 0.40) 18 15 48 55 48 55 27 2.10, df = 9 0.40)	1167 385 884 1245 1169 703 250 165 1261 720 7949 (P = 0.00 (P = 0.00 298 385 884 1169 1063 649	33 3 28 57 80 49 6 7 74 44 381 09); ₽ = 59% 10 3 32 112 106 44	1160 190 450 1243 2345 693 122 185 1264 715 8347 154 190 450 2345 1056 651	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4% 2.8% 21.6 % 1.3% 0.6% 2.6% 3.4% 3.9% 2.4%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.99 [0.66, 1.49] 0.90 [0.70, 1.15] 0.93 [0.44, 1.97] 2.47 [0.72, 8.42] 0.76 [0.50, 1.18] 0.99 [0.72, 1.35] 1.03 [0.80, 1.33] 0.62 [0.39, 0.98]	
Test for overall effect: $Z = 2.62$ (P = (1.6.3 \geq 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: $Z = 0.83$ (P = (1.6.5 At 5 years BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLEWV V BIO-RESORT BIOSTEMI DESSOLVE II	0.009) 18 25 33 41 9 19 66 44 337 (2.10, df = 9 0.40) 18 15 48 55 110 27 4	1167 3854 1245 1169 703 250 165 1261 720 7949 (P = 0.00 298 385 884 1169 1063 649 119	33 3 28 57 80 49 6 7 7 4 44 381 09); I ² = 59% 10 3 32 2112 106 44 4 2	1160 190 450 1243 2345 693 122 165 1264 715 8347 154 190 450 2345 1056 651 59	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4% 2.8% 21.6 % 1.3% 0.6% 2.6% 3.4% 3.9% 2.4% 0.3%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.99 [0.65, 1.23] 0.99 [0.66, 1.49] 0.90 [0.70, 1.15] 0.90 [0.70, 1.15] 2.47 [0.72, 8.42] 0.76 [0.50, 1.13] 0.99 [0.72, 1.35] 1.03 [0.80, 1.33] 0.62 [0.39, 0.98] 0.99 [0.19, 5.26]	
Test for overall effect: Z = 2.62 (P = 0 1.6.3 ≥ 3 years BIODEGRADE BIOPLOW-IV BIOPLOW-IV BIOPLOW-V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: Z = 0.83 (P = 0) 1.6.5 At 5 years	0.009) 18 25 27 55 33 41 9 9 19 66 44 337 (2.10, df = 9 0.40) 18 15 48 55 48 55 27 2.10, df = 9 0.40)	1167 385 884 1245 1169 703 250 165 1261 720 7949 (P = 0.00 (P = 0.00 298 385 884 1169 1063 649	33 3 28 57 80 49 6 7 74 44 381 09); ₽ = 59% 10 3 32 112 106 44	1160 190 450 1243 2345 693 122 185 1264 715 8347 154 190 450 2345 1056 651	0.6% 2.2% 3.1% 2.8% 0.8% 1.1% 3.4% 2.8% 21.6 % 1.3% 0.6% 2.6% 3.4% 3.9% 2.4%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23] 0.99 [0.66, 1.49] 0.90 [0.70, 1.15] 0.90 [0.70, 1.15] 0.90 [0.72, 1.35] 1.03 [0.80, 1.33] 0.62 [0.39, 0.98] 0.99 [0.19, 5.26] 1.77 [0.93, 3.37]	
Test for overall effect: Z = 2.62 (P = 0 1.6.3 ≥ 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: Z = 0.83 (P = 0 1.6.5 At 5 years BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-V BIOSCIENCE BIOSTEMI DESSOLVE II PRISON IV	0.009) 18 25 33 41 9 19 66 44 337 (2.10, dff= 9 0.40) 18 15 48 55 110 27 4 23	1167 385 884 1245 1265 1261 1261 1261 1261 703 703 7949 (P = 0.0) (P = 0.0) (P = 0.0) (P = 0.0) (P = 0.0) (P = 0.0) 1163 1663 1663 1663 1663 1663 1663 166	33 3 28 57 80 49 6 7 74 44 381 381 39); ² = 59% 10 3 32 112 106 44 2 13	1160 190 450 1243 2345 693 122 165 1264 715 8347 190 450 2345 1056 651 59 165	0.6% 2.2% 3.1% 2.8% 2.8% 2.8% 2.8% 21.6% 1.3% 0.6% 2.8% 2.6% 3.4% 3.9% 2.4% 0.3% 1.6%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23] 0.99 [0.66, 1.49] 0.90 [0.70, 1.15] 0.90 [0.70, 1.15] 0.90 [0.72, 1.35] 1.03 [0.80, 1.33] 0.62 [0.39, 0.98] 0.99 [0.19, 5.26] 1.77 [0.93, 3.37]	
Test for overall effect: $Z = 2.62$ (P = (1.6.3 \geq 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: $Z = 0.83$ (P = (1.6.5 A 5 years BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIOSCIENCE BIOSTEMI DESSOLVE II PRISON IV SORT OUT VII	0.009) 18 25 33 41 9 19 66 44 337 (2.10, df = 9 0.40) 18 15 48 55 110 27 4	1167 385 884 1245 1265 1261 165 720 7949 (P = 0.01 298 385 884 1169 1063 649 119 165 1261	33 3 28 57 80 49 6 7 7 4 44 381 09); I ² = 59% 10 3 32 2112 106 44 4 2	1160 190 450 1243 2345 693 122 185 1264 715 8347 154 190 450 2345 1056 651 59 165 1264	0.6% 2.2% 3.1% 2.8% 2.8% 3.4% 3.4% 2.8% 21.6% 1.3% 2.8% 3.4% 3.4% 3.4% 3.4% 3.4% 3.1%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.99 [0.66, 1.49] 0.99 [0.70, 1.15] 0.90 [0.70, 1.15] 0.91 [0.70, 1.15] 0.93 [0.44, 1.97] 2.47 [0.72, 8.42] 0.76 [0.50, 1.18] 0.99 [0.72, 1.35] 1.03 [0.80, 1.33] 0.62 [0.39, 0.98] 0.99 [0.19, 5.26] 1.77 [0.93, 3.37] 1.06 [0.74, 1.50]	
Test for overall effect: $Z = 2.62$ (P = (1.6.3 \geq 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIONYX BIO-RESORT DESSOLVE III ORIENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: $Z = 0.83$ (P = (1.6.5 At 5 years BIOFLOW-II BIOFLOW-IV BIOFLOW-IV BIOFLOW-V BIO-RESORT BIOSTEMI DESSOLVE II PRISON IV SORT OUT VII Subtotal (95% CI)	0.009) 18 25 33 41 9 19 66 44 337 (2.10, df = 9 0.40) 18 15 48 55 110 27 4 23 60	1167 385 884 1245 1265 1261 1261 1261 1261 703 703 7949 (P = 0.0) (P = 0.0) (P = 0.0) (P = 0.0) (P = 0.0) (P = 0.0) 1163 1663 1663 1663 1663 1663 1663 166	33 3 28 57 80 49 6 7 7 4 4 4 4 4 381 09); ₽ = 59% 10 3 32 2112 106 44 2 13 57	1160 190 450 1243 2345 693 122 165 1264 715 8347 190 450 2345 1056 651 59 165	0.6% 2.2% 3.1% 2.8% 2.8% 2.8% 2.8% 21.6% 1.3% 0.6% 2.8% 2.6% 3.4% 3.9% 2.4% 0.3% 1.6%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.89 [0.65, 1.23] 0.99 [0.66, 1.49] 0.90 [0.70, 1.15] 0.90 [0.70, 1.15] 0.90 [0.72, 1.35] 1.03 [0.80, 1.33] 0.62 [0.39, 0.98] 0.99 [0.19, 5.26] 1.77 [0.93, 3.37]	
Test for overall effect: $Z = 2.62$ (P = 0 1.6.3 \geq 3 years BIODEGRADE BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: $Z = 0.83$ (P = 0 1.6.5 At 5 years BIOFLOW-II BIOFLOW-II BIOFLOW-IV BIOFLOW-IV BIOSCIENCE BIOSTEMI DESSOLVE II PRISON IV SORT OUT VII Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.02; Chi ² = 1	0.009) 18 25 27 55 33 41 9 19 66 44 337 (2.10, df = 9 0.40) 18 15 48 510 27 4 23 60 360 0.83, df = 8	1167 385 1245 1245 1265 1261 720 7949 (P = 0.01 (P = 0.01 (P = 0.01) (P = 0.01) 1261 1169 1063 649 1165 1261 15 993	33 3 28 57 80 49 6 7 74 44 381 39); ² = 59% 10 3 32 112 106 44 4 2 13 57 379	1160 190 450 1243 2345 693 122 185 1264 715 8347 154 190 450 2345 1056 651 59 165 1264	0.6% 2.2% 3.1% 2.8% 2.8% 3.4% 3.4% 2.8% 21.6% 1.3% 2.8% 3.4% 3.4% 3.4% 3.4% 3.4% 3.1%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.99 [0.66, 1.49] 0.99 [0.70, 1.15] 0.90 [0.70, 1.15] 0.91 [0.70, 1.15] 0.93 [0.44, 1.97] 2.47 [0.72, 8.42] 0.76 [0.50, 1.18] 0.99 [0.72, 1.35] 1.03 [0.80, 1.33] 0.62 [0.39, 0.98] 0.99 [0.19, 5.26] 1.77 [0.93, 3.37] 1.06 [0.74, 1.50]	
Test for overall effect: $Z = 2.62$ (P = 0 1.6.3 \geq 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TaLENT Subtotal (95% CI) Total events BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOSCIENCE BIOSTEMI DESSOLVE II PRISON IV SORT OUT VII SUBTOTAL (95% CI) Total events	0.009) 18 25 27 55 33 41 9 19 66 44 337 (2.10, df = 9 0.40) 18 15 48 510 27 4 23 60 360 0.83, df = 8	1167 385 1245 1245 1265 1261 720 7949 (P = 0.01 (P = 0.01 (P = 0.01) (P = 0.01) 1261 1169 1063 649 1165 1261 15 993	33 3 28 57 80 49 6 7 74 44 381 39); ² = 59% 10 3 32 112 106 44 4 2 13 57 379	1160 190 450 1243 2345 693 122 185 1264 715 8347 154 190 450 2345 1056 651 59 165 1264	0.6% 2.2% 3.1% 2.8% 2.8% 3.4% 3.4% 2.8% 21.6% 1.3% 2.8% 3.4% 3.4% 3.4% 3.4% 3.4% 3.1%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.99 [0.66, 1.49] 0.99 [0.70, 1.15] 0.90 [0.70, 1.15] 0.91 [0.70, 1.15] 0.93 [0.44, 1.97] 2.47 [0.72, 8.42] 0.76 [0.50, 1.18] 0.99 [0.72, 1.35] 1.03 [0.80, 1.33] 0.62 [0.39, 0.98] 0.99 [0.19, 5.26] 1.77 [0.93, 3.37] 1.06 [0.74, 1.50]	
Test for overall effect: $Z = 2.62$ (P = 0 1.6.3 \geq 3 years BIODEGRADE BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: $Z = 0.83$ (P = 0 1.6.5 At 5 years BIOFLOW-II BIOFLOW-II BIOFLOW-IV BIOFLOW-IV BIOSCIENCE BIOSTEMI DESSOLVE II PRISON IV SORT OUT VII Subtotal (95% CI) Total events Heterogeneity: Tau ² = 0.02; Chi ² = 1	0.009) 18 25 27 55 33 41 9 19 66 44 337 (2.10, df = 9 0.40) 18 15 48 510 27 4 23 60 360 0.83, df = 8	1167 385 1245 1245 1265 1261 720 7949 (P = 0.01 (P = 0.01 (P = 0.01) (P = 0.01) 1261 1169 1063 649 1165 1261 15 993	33 3 28 57 80 49 6 7 74 44 381 39); ² = 59% 10 3 32 112 106 44 4 2 13 57 379	1160 190 450 1243 2345 693 122 165 1264 715 8347 190 450 2345 1056 651 59 1056 651 59 1264 6334	0.6% 2.2% 3.1% 2.8% 2.8% 3.4% 3.4% 2.8% 21.6% 1.3% 2.8% 3.4% 3.4% 3.4% 3.4% 3.4% 3.1%	4.11 [1.26, 13.45] 0.49 [0.29, 0.82] 0.96 [0.67, 1.38] 0.83 [0.56, 1.23] 0.82 [0.55, 1.23] 0.73 [0.27, 2.01] 2.71 [1.17, 6.28] 0.99 [0.66, 1.49] 0.99 [0.70, 1.15] 0.90 [0.70, 1.15] 0.91 [0.70, 1.15] 0.93 [0.44, 1.97] 2.47 [0.72, 8.42] 0.76 [0.50, 1.18] 0.99 [0.72, 1.35] 1.03 [0.80, 1.33] 0.62 [0.39, 0.98] 0.99 [0.19, 5.26] 1.77 [0.93, 3.37] 1.06 [0.74, 1.50]	
Test for overall effect: $Z = 2.62$ (P = 0 1.6.3 \geq 3 years BIODEGRADE BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ^a = 0.09; Chi ^a = 2 Test for overall effect: $Z = 0.83$ (P = 0 1.6.5 At 5 years BIOFLOW-II BIOFLOW-II BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOSCIENCE	0.009) 18 25 33 41 9 19 66 44 337 (2.10, dff = 9 0.40) 18 15 48 55 110 27 4 360 0.83, dff = 8 0.81)	1167 385 884 11245 11269 703 250 165 1261 720 7949 (P = 0.01 (P = 0.01 298 385 884 1169 1063 649 119 1165 1261 5993 (P = 0.21	33 3 28 57 80 49 6 7 74 44 381 39); * = 59% 10 3 32 112 106 44 2 3 57 379 1); * = 26%	1160 190 450 1243 2345 693 122 165 1264 715 8347 190 450 2345 1056 651 59 1056 651 59 1264 6334	0.6% 2.2% 3.1% 2.8% 0.8% 2.8% 2.8% 2.8% 2.8% 2.6% 3.4% 0.6% 2.6% 3.4% 0.5% 2.4% 0.3% 2.4% 0.3% 1.6% 3.1%	4.11 [1,26,13,45] 0.49 [0.29,0.82] 0.96 [0.67,1,38] 0.83 [0.56,1,23] 0.73 [0.57,1,23] 0.73 [0.72,01] 2.71 [1.17,6,26] 0.89 [0.65,1,23] 0.99 [0.66,1,49] 0.90 [0.70,1,15] 0.90 [0.70,1,15] 0.90 [0.70,1,15] 1.03 [0.80,1,33] 0.62 [0.39,0.98] 0.99 [0.19,5,26] 1.77 [0.93,3,37] 1.06 [0.74,1,50] 0.98 [0.81,1,17]	
Test for overall effect: $Z = 2.62$ (P = 0 1.6.3 \geq 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIONYX BIORESORT DESSOLVE III ORIENT FRISON IV SUBTOTAL (95% CI) Total events Heterogeneity: Tau ² = 0.09; Chi ² = 2 Test for overall effect: $Z = 0.83$ (P = 0 1.6.5 At 5 years BIOFLOW-II BIOFLOW-II BIOFLOW-IV BIORESORT BIOSTEMI DESSOLVE II PRISON IV SUBTOTAL (95% CI) Total events Heterogeneity: Tau ² = 0.02; Chi ² = 1 Test for overall effect: $Z = 0.24$ (P = 0 1.6.5 (C) Total events	0.009) 18 25 33 41 9 19 64 44 337 (2.10, df = 9 0.40) 18 15 48 55 110 23 60 0.83, df = 8 0.81)	1167 385 884 1245 1261 703 250 165 1261 720 7949 (P = 0.01 298 385 884 1169 1063 884 1169 119 1261 1261 1261 (P = 0.2' 47343	33 3 28 57 80 49 6 7 7 44 44 381 7 30); ₽=59% 10 3 32 112 106 4 4 2 13 379 1); ₽=26%	1160 190 450 1243 2345 693 122 165 1264 715 8347 154 190 450 2345 1056 651 159 165 1264 6334	0.6% 2.2% 3.1% 2.8% 0.8% 2.8% 2.8% 2.8% 2.8% 2.6% 3.4% 0.6% 2.6% 3.4% 0.5% 2.4% 0.3% 2.4% 0.3% 1.6% 3.1%	4.11 [1,26,13,45] 0.49 [0.29,0.82] 0.96 [0.67,1,38] 0.83 [0.56,1,23] 0.73 [0.57,1,23] 0.73 [0.72,01] 2.71 [1.17,6,26] 0.89 [0.65,1,23] 0.99 [0.66,1,49] 0.90 [0.70,1,15] 0.90 [0.70,1,15] 0.90 [0.70,1,15] 1.03 [0.80,1,33] 0.62 [0.39,0.98] 0.99 [0.19,5,26] 1.77 [0.93,3,37] 1.06 [0.74,1,50] 0.98 [0.81,1,17]	
Test for overall effect: $Z = 2.62$ (P = 0 1.6.3 \geq 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIORENT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Tau ^a = 0.09; Chi ^a = 2 Test for overall effect: $Z = 0.83$ (P = 0 1.6.5 At 5 years BIOFLOW-II BIOFLOW-II BIOFLOW-II BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOSCIENCE	0.009) 18 25 33 41 9 19 66 44 	1167 385 884 1245 1261 703 250 165 1261 720 7949 (P = 0.01 298 385 884 1169 1063 884 1169 119 1261 1261 1261 (P = 0.2' 47343	33 3 28 57 80 49 6 7 7 44 44 381 7 30); ₽=59% 10 3 32 112 106 4 4 2 13 379 1); ₽=26%	1160 190 450 1243 2345 693 122 165 1264 715 8347 154 190 450 2345 1056 651 159 165 1264 6334	0.6% 2.2% 3.1% 2.8% 0.8% 2.8% 2.8% 2.8% 2.8% 2.6% 3.4% 0.6% 2.6% 3.4% 0.5% 2.4% 0.3% 2.4% 0.3% 1.6% 3.1%	4.11 [1,26,13,45] 0.49 [0.29,0.82] 0.96 [0.67,1,38] 0.83 [0.56,1,23] 0.73 [0.57,1,23] 0.73 [0.72,01] 2.71 [1.17,6,26] 0.89 [0.65,1,23] 0.99 [0.66,1,49] 0.90 [0.70,1,15] 0.90 [0.70,1,15] 0.90 [0.70,1,15] 1.03 [0.80,1,33] 0.62 [0.39,0.98] 0.99 [0.19,5,26] 1.77 [0.93,3,37] 1.06 [0.74,1,50] 0.98 [0.81,1,17]	

Fig. 6 Forest plot of target lesion revascularization (TLR) from 1 to 5 years follow-up

Study or Subgroup	Ultrathin Events	Total	Standard 2 Events		Weight	Risk Ratio M-H, Fixed, 95% Cl	Risk Ratio M-H, Fixed, 95% Cl
1.7.1 ≥ 1 year						.,,	
BIODEGRADE	23	1167	27	1160	1.2%	0.85 [0.49, 1.47]	
	23	298					
BIOFLOW-II			13	154	0.8%	0.87 [0.45, 1.69]	
BIOFLOW-IV	12	372	5	181	0.3%	1.17 [0.42, 3.26]	
BIOFLOW V	27	833	15	422	0.9%	0.91 [0.49, 1.70]	
BIOFLOW-VI	0	220	4	220	0.2%	0.11 [0.01, 2.05]	←
BIONYX	38	1245	39	1243	1.8%	0.97 [0.63, 1.51]	
BIO-RESORT	26	1169	53	2345	1.6%	0.98 [0.62, 1.57]	
BIOSCIENCE	53	1063	38	1056	1.7%	1.39 [0.92, 2.08]	
BIOSTEMI	13	649	25	651	1.1%	0.52 [0.27, 1.01]	
CASTLE	14	722	20	718	0.9%	0.70 [0.35, 1.37]	
DESSOLVE II	2	117	20	60	0.1%		
						0.51 [0.07, 3.55]	
DESSOLVE III	32	703	40	695	1.8%	0.79 [0.50, 1.24]	
meriT-V	0	168	0	84		Not estimable	
ORIENT	7	250	4	122	0.2%	0.85 [0.25, 2.86]	
PRISON IV	0	165	3	165	0.2%	0.14 [0.01, 2.74]	←
SORT OUT IX	56	1579	76	1572	3.5%	0.73 [0.52, 1.03]	
SORT OUT VII	52	1261	66	1264	3.0%	0.79 [0.55, 1.13]	
TALENT	29	720	38	715	1.7%	0.76 [0.47, 1.22]	
Yamaji et al. 2018 (CARDIOBASE)	68	1451	66	1451	3.0%	1.03 [0.74, 1.43]	
	00	14152	00	14278	24.2%		
Subtotal (95% CI)		14152		14270	∠4.∠70	0.87 [0.77, 0.98]	•
Total events	474		534				
Heterogeneity: Chi ² = 15.00, df = 17	(P = 0.60):	I² = 0%					
Test for overall effect: Z = 2.29 (P = 0							
. 551.51 646141 61661. 2 - 2.25 (F - 0	0.02)						
173 - 310000							
1.7.2 ≥ 2 years							
BIOFLOW-IV	18	385	11	190	0.7%	0.81 [0.39, 1.68]	
BIOFLOWV	36	816	31	409	1.9%	0.58 [0.37, 0.93]	
BIONYX	57	1245	66	1243	3.0%	0.86 [0.61, 1.22]	_ _
BIO-RESORT	43	1169	95	2345	2.9%	0.91 [0.64, 1.29]	
BIOSCIENCE	81	1063	75	1056	3.4%	1.07 [0.79, 1.45]	+-
BIOSTEMI	22	649	41	651	1.9%	0.54 [0.32, 0.89]	
DESSOLVE II	2	120	5	60	0.3%	0.20 [0.04, 1.00]	
DESSOLVE III	47	703	58	695	2.7%	0.80 [0.55, 1.16]	
meriT-V	4	168	2	84	0.1%	1.00 [0.19, 5.35]	
ORIENT	11	250	7	122	0.4%	0.77 [0.30, 1.93]	
SORT OUT IX	91	1579	104	1572	4.7%	0.87 [0.66, 1.14]	
SORT OUT VII	79	1261	94	1264	4.3%	0.84 [0.63, 1.12]	
TALENT	52	720	49	715	2.2%	1.05 [0.72, 1.54]	
Subtotal (95% CI)		10128		10406	28.5%	0.85 [0.76, 0.95]	◆
Total events	543		638				
			000				
		IZ - 6.06					
Heterogeneity: Chi ² = 12.68, df = 12	(P = 0.39);	I ² = 5%					
	(P = 0.39);	I² = 5%					
Heterogeneity: Chi² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0	(P = 0.39);	I ² = 5%					
Heterogeneity: Chi ² = 12.68, df = 12	(P = 0.39);	I² = 5%					
Heterogeneity: Chi² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years	(P = 0.39); 0.005)	I² = 5% 1167	49	1160	2.2%	0.65 (0.42. 1.01)	
Heterogeneity: Chi [≈] = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIODEGRADE	(P = 0.39); 0.005) 32	1167				0.65 [0.42, 1.01] 1 19 (0.62, 2.28]	
Heterogeneity: Chi ^z = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIODEGRADE BIOFLOW-IV	(P = 0.39); 0.005) 32 29	1167 385	12	190	0.7%	1.19 [0.62, 2.28]	
Heterogeneity: Chi ^z = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW V	(P = 0.39); 0.005) 32 29 45	1167 385 884	12 42	190 450	0.7% 2.5%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82]	
Heterogeneity: Chi² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0	(P = 0.39); 0.005) 32 29	1167 385	12	190	0.7%	1.19 [0.62, 2.28]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIOEGRADE BIOFLOW-IV BIOFLOW-V BIOFLOW V BIONYX	(P = 0.39); 0.005) 32 29 45	1167 385 884	12 42	190 450	0.7% 2.5%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20]	
Heterogeneity: Chi [≈] = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIODEGRADE BIOFLOW-IV BIOFLOW V BIOFLOW V BIONYX BIO-RESORT	(P = 0.39); 0.005) 32 29 45 75 56	1167 385 884 1245 1169	12 42 84 125	190 450 1243 2345	0.7% 2.5% 3.8% 3.8%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22]	
Heterogeneity: Chi [≈] = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIODEGRADE BIOFLOW-IV BIOFLOW V BIOFLOW V BIONYX BIO-RESORT DESSOLVE III	(P = 0.39); 0.005) 32 29 45 75 56 59	1167 385 884 1245 1169 703	12 42 84 125 69	190 450 1243 2345 693	0.7% 2.5% 3.8% 3.8% 3.2%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIODEORADE BIOFLOW-IV BIOFLOW V BIORUW V BIORYX BIORESORT DESSOLVE III ORIENT	(P = 0.39); 0.005) 32 29 45 75 56 59 15	1167 385 884 1245 1169 703 250	12 42 84 125 69 7	190 450 1243 2345 693 122	0.7% 2.5% 3.8% 3.8% 3.2% 0.4%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50]	
Heterogeneity: Chi ^z = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW V	(P = 0.39); 0.005) 32 29 45 75 56 59	1167 385 884 1245 1169 703	12 42 84 125 69	190 450 1243 2345 693	0.7% 2.5% 3.8% 3.8% 3.2%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIODEORADE BIOFLOW-IV BIOFLOW V BIORUW V BIORYX BIORESORT DESSOLVE III ORIENT	(P = 0.39); 0.005) 32 29 45 75 56 59 15	1167 385 884 1245 1169 703 250	12 42 84 125 69 7	190 450 1243 2345 693 122	0.7% 2.5% 3.8% 3.8% 3.2% 0.4%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50]	
Heterogeneity: Chi [∞] = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIODEGRADE BIOFLOW+V BIOFLOW V BIOFLOW V BIO-RESORT DESSOLF III ORIENT PRISON IV SORT OUT VII	(P = 0.39); 0.005) 32 29 45 75 56 59 15 2 107	1167 385 884 1245 1169 703 250 165 1261	12 42 84 125 69 7 4 114	190 450 1243 2345 693 122 165 1264	0.7% 2.5% 3.8% 3.8% 3.2% 0.4% 0.2% 5.2%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIODEORADE BIOFLOW-IV BIOFLOW-V BIONYX BIONY	(P = 0.39); 0.005) 32 29 45 75 56 59 15 2	1167 385 884 1245 1169 703 250 165 1261 720	12 42 84 125 69 7 4	190 450 1243 2345 693 122 165 1264 715	0.7% 2.5% 3.8% 3.8% 3.2% 0.4% 0.2% 5.2% 2.6%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIODEORADE BIOFLOW-IV BIOFLOW-V BIOFLOW V BIOFLOW V BIOFLOW V BIOFLOW V BIOFLOM V SORT OUT VII TALENT Subtotal (95% CI)	(P = 0.39); 0.005) 32 29 45 75 56 59 15 2 107 56	1167 385 884 1245 1169 703 250 165 1261	12 42 84 125 69 7 4 114 57	190 450 1243 2345 693 122 165 1264	0.7% 2.5% 3.8% 3.8% 3.2% 0.4% 0.2% 5.2%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21]	
Heterogeneity: Chi [∞] = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIODEGRADE BIOFLOW-IV BIOFLOW V BIOFLOW V BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events	(P = 0.39); 0.005) 32 29 45 75 56 59 15 2 107 56 476	1167 385 884 1245 1169 703 250 165 1261 720 7949	12 42 84 125 69 7 4 114	190 450 1243 2345 693 122 165 1264 715	0.7% 2.5% 3.8% 3.8% 3.2% 0.4% 0.2% 5.2% 2.6%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39]	
Heterogeneity: Chi [∞] = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIODEGRADE BIOFLOW-IV BIOFLOW V BIOFLOW V BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events	(P = 0.39); 0.005) 32 29 45 75 56 59 15 2 107 56 476	1167 385 884 1245 1169 703 250 165 1261 720 7949	12 42 84 125 69 7 4 114 57	190 450 1243 2345 693 122 165 1264 715	0.7% 2.5% 3.8% 3.8% 3.2% 0.4% 0.2% 5.2% 2.6%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIODEGRADE BIOFLOW+V BIOFLOW V BIOFLOW V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P	(P = 0.39); 0.005) 32 29 45 75 56 59 15 2 107 56 476 2 = 0.43); P=	1167 385 884 1245 1169 703 250 165 1261 720 7949	12 42 84 125 69 7 4 114 57	190 450 1243 2345 693 122 165 1264 715	0.7% 2.5% 3.8% 3.8% 3.2% 0.4% 0.2% 5.2% 2.6%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39]	
Heterogeneity: $Chi^{2} = 12.68$, $df = 12$ Test for overall effect: $Z = 2.83$ (P = 0 1.7.3 \geq 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: $Chi^{2} = 9.13$, $df = 9$ (P	(P = 0.39); 0.005) 32 29 45 75 56 59 15 2 107 56 476 2 = 0.43); P=	1167 385 884 1245 1169 703 250 165 1261 720 7949	12 42 84 125 69 7 4 114 57	190 450 1243 2345 693 122 165 1264 715	0.7% 2.5% 3.8% 3.8% 3.2% 0.4% 0.2% 5.2% 2.6%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \geq 3 years BIOEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-V BIOFLSORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0)	(P = 0.39); 0.005) 32 29 45 75 56 59 15 2 107 56 476 2 = 0.43); P=	1167 385 884 1245 1169 703 250 165 1261 720 7949	12 42 84 125 69 7 4 114 57	190 450 1243 2345 693 122 165 1264 715	0.7% 2.5% 3.8% 3.8% 3.2% 0.4% 0.2% 5.2% 2.6%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \ge 3 years BIODEGRADE BIOFLOW-IV BIOFLOW V BIOFLOW V BIORYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 At 5 years	(P = 0.39); 0.005) 32 29 45 75 56 56 59 15 2 107 56 476 (= 0.43); P= 0.01)	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1%	12 42 84 125 69 7 4 114 57 563	190 450 1243 2345 693 122 165 1264 715 8347	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 5.2% 2.6% 24.7%	1.19 [0.62, 2.28] 0.65 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.5] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39] 0.86 [0.76, 0.97]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \ge 3 years BIODEGRADE BIOFLOW-IV BIOFLOW V BIOFLOW V BIORYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 At 5 years	(P = 0.39); 0.005) 32 29 45 75 56 59 15 2 107 56 476 2 = 0.43); P=	1167 385 884 1245 1169 703 250 165 1261 720 7949	12 42 84 125 69 7 4 114 57	190 450 1243 2345 693 122 165 1264 715	0.7% 2.5% 3.8% 3.8% 3.2% 0.4% 0.2% 5.2% 2.6%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39]	
Heterogeneity: $Chi^2 = 12.68$, $df = 12$ Test for overall effect: $Z = 2.83$ (P = 0 1.7.3 \ge 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIORYX BIORESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: $Chi^2 = 9.13$, $df = 9$ (P Test for overall effect: $Z = 2.54$ (P = 0 1.7.5 At 5 years BIOFLOW-II	(P = 0.39); 0.005) 32 29 45 75 56 56 59 15 2 107 56 476 (= 0.43); P= 0.01)	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1%	12 42 84 125 69 7 4 114 57 563	190 450 1243 2345 693 122 165 1264 715 8347	0.7% 2.5% 3.8% 3.2% 0.4% 5.2% 2.6% 2.6% 24.7%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.80 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.09, 2.68] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39] 0.86 [0.76, 0.97] 1.24 [0.70, 2.19]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \ge 3 years BIODEORADE BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIOFLOW V BIOFLOW V BIOFLOW V BIOFLOW V SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 At 5 years BIOFLOW-II BIOFLOW-IV	(P = 0.39); 0.005) 32 29 45 56 59 15 2 107 56 476 *= 0.43); P= 0.01) 36 35	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1%	12 42 84 125 69 7 4 114 57 563 15 13	190 450 1243 2345 693 122 165 1264 715 8347 154 154	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 5.2% 2.6% 24.7%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.80 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39] 0.86 [0.76, 0.97] 1.24 [0.70, 2.19] 1.33 [0.72, 2.45]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \geq 3 years BIODEORADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIORESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Solutional (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 At 5 years BIOFLOW-IV BIOFLOW-IV BIOFLOW V	(P = 0.39); 0.005) 32 29 45 56 59 15 2 107 56 476 476 56 476 56 476 56 56 57 56 56 57 56 57 56 56 59 15 75 56 59 15 75 56 59 15 75 56 59 15 75 56 56 59 15 75 56 56 59 15 75 56 56 57 56 56 57 56 56 57 56 56 57 56 56 57 56 56 57 56 56 56 56 56 56 56 56 56 56	1167 385 884 1245 1169 703 250 1261 720 7949 = 1%	12 42 84 125 69 7 4 114 57 563 15 13 51	190 450 1243 2345 693 122 165 1264 715 8347 154 154	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 5.2% 2.6% 24.7%	1.19 [0.62, 2.28] 0.65 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39] 0.86 [0.76, 0.97] 1.24 [0.70, 2.19] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \geq 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 At 5 years BIOFLOW-II BIOFLOW-IV BIOFLOW-IV BIOFLOW-V BIOFLOW-V	(P = 0.39); 0.005) 32 29 45 75 56 59 15 2 107 56 476 (= 0.43); P= 0.01) 36 35 75 91	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1% 298 385 884 1169	12 42 84 125 69 7 4 114 57 563 15 13 1180	190 450 1243 2345 693 122 165 1264 765 8347 154 190 450 2345	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 5.2% 2.6% 24.7% 0.9% 0.8% 3.1% 5.5%	1.19 [0.62, 2.28] 0.65 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.04, 2.50] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39] 0.86 [0.76, 0.97] 1.24 [0.70, 2.19] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.01 [0.80, 1.29]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 ≥ 3 years BIODEGRADE BIOPLOW-IV BIOFLOW-IV BIOFLOW V BIONYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 At 5 years BIOFLOW-II BIOFLOW-IV BIOFLOW-IV BIOFLOW-V BIOFLOW-V	(P = 0.39); 0.005) 32 29 45 56 59 15 2 107 56 476 476 56 476 56 476 56 56 57 56 56 57 56 57 56 56 59 15 75 56 59 15 75 56 59 15 75 56 59 15 75 56 56 59 15 75 56 56 59 15 75 56 56 57 56 56 57 56 56 57 56 56 57 56 56 57 56 56 57 56 56 56 56 56 56 56 56 56 56	1167 385 884 1245 1169 703 250 1261 720 7949 = 1%	12 42 84 125 69 7 4 114 57 563 15 13 51	190 450 1243 2345 693 122 165 1264 715 8347 154 154	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 5.2% 2.6% 24.7%	1.19 [0.62, 2.28] 0.65 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39] 0.86 [0.76, 0.97] 1.24 [0.70, 2.19] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09]	
Heterogeneity: $Chi^2 = 12.68$, $df = 12$ Test for overall effect: $Z = 2.83$ (P = 0 1.7.3 ≥ 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIOFLOW V BIORESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: $Chi^2 = 9.13$, $df = 9$ (P Test for overall effect: $Z = 2.54$ (P = 0 1.7.5 At 5 years BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIO-RESORT BIOSCIENCE	(P = 0.39); 0.005) 32 29 45 75 56 59 15 2 107 56 476 -= 0.43); P= 0.01) 36 35 78 91 130	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1% 298 385 884 1169 1063	12 42 84 125 69 7 4 114 57 563 15 13 51 13 51 180 132	190 450 1243 2345 693 122 165 1264 765 8347 154 190 450 2345 1056	0.7% 2.5% 3.8% 3.2% 0.4% 2.6% 2.6% 2.4.7% 0.9% 0.8% 3.1% 5.5% 6.0%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.80 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.88, 1.39] 0.86 [0.76, 0.97] 1.24 [0.70, 2.19] 1.33 [0.72, 2.45] 0.78 [0.56, 1.29] 1.01 [0.80, 1.29] 0.98 [0.78, 1.23]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \geq 3 years BIODEORADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIORENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 At 5 years BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOSCIENCE BIOSCIENCE BIOSTEMI	(P = 0.39); 0.005) 32 29 45 56 59 15 2 107 56 476 2 107 56 476 2 0.01) 36 35 78 91 130 33	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1% 298 385 884 1169 1063	12 42 84 125 69 7 4 114 57 563 15 13 51 180 132 52	190 450 1243 2345 693 122 1264 715 8347 154 190 450 2345 1056 651	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 5.2% 2.6% 24.7% 0.9% 0.8% 3.1% 5.5% 6.0% 2.4%	1.19 [0.62, 2.28] 0.55 [0.36, 0.20] 0.89 [0.66, 1.20] 0.80 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.50] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.66, 1.39] 0.86 [0.76, 0.97] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.01 [0.80, 1.29] 0.98 [0.78, 1.23] 0.86 [0.74, 2.45] 0.78 [0.56, 1.09]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \geq 3 years BIODEGRADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIORESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT SUBTOT (05% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 At 5 years BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOSCIENCE BIOSCIENCE BIOSCIENCE BIOSTEMII DESSOLVE II	(P = 0.39); 0.005) 32 29 475 56 59 107 56 476 56 476 56 50 50 50 50 50 50 50 50 50 50 50 50 50	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1% 298 385 884 1169 1063 649 1063	12 42 84 125 69 7 4 114 57 563 15 13 51 180 132 52 52 6	190 450 1243 2345 693 122 165 1264 715 8347 154 190 450 2345 1056 651 59	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 2.6% 24.7% 0.9% 0.8% 3.1% 5.5% 6.0% 2.4%	1.19 [0.62, 2.28] 0.65 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.63] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39] 0.86 [0.76, 0.97] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.01 [0.80, 1.29] 0.86 [0.74, 0.97] 0.68 [0.42, 0.97]	
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Heterogeneity: $Chi^2 = 12.68$, $df = 12$ Test for overall effect: $Z = 2.83$ (P = 0 1.7.3 \ge 3 years BIODEORADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-V BIOFLOW-V BIORESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: $Chi^2 = 9.13$, $df = 9$ (P Test for overall effect: $Z = 2.54$ (P = 0 1.7.5 At 5 years BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIORESORT BIOSCIENCE BIOSTEMI DESSOLVE II SORT OUT VII	(P = 0.39); 0.005) 32 29 475 56 59 107 56 476 56 476 56 50 50 50 50 50 50 50 50 50 50 50 50 50	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1% 298 385 884 1169 1063 649 119	12 42 84 125 69 7 4 114 57 563 15 13 51 180 132 52 52 6	190 450 1243 2345 693 122 165 1264 715 8347 154 190 450 2345 1056 651 59	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 2.6% 2.6% 24.7% 0.8% 3.1% 5.5% 6.0% 2.4% 0.4% 3.7%	1.19 [0.62, 2.28] 0.65 [0.36, 0.82] 0.89 [0.66, 1.20] 0.90 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.63] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39] 0.86 [0.76, 0.97] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.01 [0.80, 1.29] 0.86 [0.74, 0.97] 0.68 [0.42, 0.97]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \ge 3 years BIODEORADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-V BIOFLOW-V BIOFLOW V BIOFLOW V BIOFLOW V SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 At 5 years BIOFLOW-II BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOSCIENCE BIOSCIENC	(P = 0.39); 0.005) 32 29 45 5 56 56 56 56 56 56 56 56 56	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1% 298 385 885 885 885 8169 1063 649 119 1261	12 42 84 125 69 7 4 114 57 563 15 13 51 180 132 52 6 81	190 450 1243 2345 693 122 165 1264 715 8347 154 190 450 2345 1056 651 59 1264	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 2.6% 2.6% 24.7% 0.8% 3.1% 5.5% 6.0% 2.4% 0.4% 3.7%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.80 [0.66, 1.22] 0.84 [0.61, 1.21] 0.50 [0.44, 2.50] 0.50 [0.09, 2.68] 0.94 [0.73, 1.21] 0.98 [0.76, 0.97] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.31 [0.70, 2.19] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.01 [0.80, 1.29] 0.98 [0.78, 1.23] 0.64 [0.42, 0.97] 1.51 [0.83, 1.49]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \geq 3 years BIODEGRADE BIOFLOW-W BIOFLOW-W BIOFLOW-W BIORYX BIO-RESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 A 5 years BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-V BIOSCIENCE BIOSCIENCE BIOSTEMI DESSOLVE II SORT OUT VII SUBtotal (95% CI) Total events	(P = 0.39); 0.005) 32 29 45 56 59 15 2 107 56 476 56 35 78 91 130 0.01) 36 35 78 91 133 6 90 499	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1% 298 385 884 1169 1063 649 119 1261 5828	12 42 84 125 69 7 4 114 57 563 15 13 51 180 132 52 52 6	190 450 1243 2345 693 122 165 1264 715 8347 154 190 450 2345 1056 651 59 1264	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 2.6% 2.6% 24.7% 0.8% 3.1% 5.5% 6.0% 2.4% 0.4% 3.7%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.80 [0.66, 1.22] 0.84 [0.61, 1.21] 0.50 [0.44, 2.50] 0.50 [0.09, 2.68] 0.94 [0.73, 1.21] 0.98 [0.76, 0.97] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.31 [0.70, 2.19] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.01 [0.80, 1.29] 0.98 [0.78, 1.23] 0.64 [0.42, 0.97] 1.51 [0.83, 1.49]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \ge 3 years BIODEORADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-V BIORYX BIORESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 At 5 years BIOFLOW-II BIOFLOW-II BIOFLOW-IV BIOFLOW-V BIORESORT BIOSTEMI DESSOLVE II SORT OUT VII SUBTOTAI (95% CI) Total events Heterogeneity: Chi ² = 9.85, df = 7 (P	(P = 0.39); 0.005) 32 29 45 75 56 476 59 15 2 107 56 476 56 476 56 476 56 476 35 78 91 130 33 6 90 499 92 = 0.21); P=	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1% 298 385 884 1169 1063 649 119 1261 5828	12 42 84 125 69 7 4 114 57 563 15 13 51 180 132 52 6 81	190 450 1243 2345 693 122 165 1264 715 8347 154 190 450 2345 1056 651 59 1264	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 2.6% 2.6% 24.7% 0.8% 3.1% 5.5% 6.0% 2.4% 0.4% 3.7%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.80 [0.66, 1.22] 0.84 [0.61, 1.21] 0.50 [0.44, 2.50] 0.50 [0.09, 2.68] 0.94 [0.73, 1.21] 0.98 [0.76, 0.97] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.31 [0.70, 2.19] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.01 [0.80, 1.29] 0.98 [0.78, 1.23] 0.64 [0.42, 0.97] 1.51 [0.83, 1.49]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \ge 3 years BIODEORADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-V BIORYX BIORESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 At 5 years BIOFLOW-II BIOFLOW-II BIOFLOW-IV BIOFLOW-V BIORESORT BIOSTEMI DESSOLVE II SORT OUT VII SUBTOTAI (95% CI) Total events Heterogeneity: Chi ² = 9.85, df = 7 (P	(P = 0.39); 0.005) 32 29 45 75 56 476 59 15 2 107 56 476 56 476 56 476 56 476 35 78 91 130 33 6 90 499 92 = 0.21); P=	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1% 298 385 884 1169 1063 649 119 1261 5828	12 42 84 125 69 7 4 114 57 563 15 13 51 180 132 52 6 81	190 450 1243 2345 693 122 165 1264 715 8347 154 190 450 2345 1056 651 59 1264	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 2.6% 2.6% 24.7% 0.8% 3.1% 5.5% 6.0% 2.4% 0.4% 3.7%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.80 [0.66, 1.22] 0.84 [0.61, 1.21] 0.50 [0.44, 2.50] 0.50 [0.09, 2.68] 0.94 [0.73, 1.21] 0.98 [0.76, 0.97] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.31 [0.70, 2.19] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.01 [0.80, 1.29] 0.98 [0.78, 1.23] 0.64 [0.42, 0.97] 1.51 [0.83, 1.49]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \ge 3 years BIODEORADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-V BIORYX BIORESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 At 5 years BIOFLOW-II BIOFLOW-II BIOFLOW-IV BIOFLOW-V BIORESORT BIOSTEMI DESSOLVE II SORT OUT VII SUBTOTAI (95% CI) Total events Heterogeneity: Chi ² = 9.85, df = 7 (P	(P = 0.39); 0.005) 32 29 45 75 56 476 59 15 2 107 56 476 56 476 56 476 56 476 35 78 91 130 33 6 90 499 92 = 0.21); P=	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1% 298 385 884 1169 1063 649 119 1261 5828	12 42 84 125 69 7 4 114 57 563 15 13 51 180 132 52 6 81	190 450 1243 2345 693 122 165 1264 715 8347 154 190 450 2345 1056 651 59 1264	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 2.6% 2.6% 24.7% 0.8% 3.1% 5.5% 6.0% 2.4% 0.4% 3.7%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.80 [0.66, 1.22] 0.84 [0.61, 1.21] 0.50 [0.44, 2.50] 0.50 [0.09, 2.68] 0.94 [0.73, 1.21] 0.98 [0.76, 0.97] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.31 [0.70, 2.19] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.01 [0.80, 1.29] 0.98 [0.78, 1.23] 0.64 [0.42, 0.97] 1.51 [0.83, 1.49]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \ge 3 years BIODEORADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIORESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 A 5 years BIOFLOW-II BIOFLOW-II BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOSTEMI DESSOLVE II SORT OUT VII Subtotal (95% CI) Total events Heterogeneity: Chi ² = 9.65, df = 7 (P Test for overall effect: Z = 0.65 (P = 0	(P = 0.39); 0.005) 32 29 45 75 56 476 59 15 2 107 56 476 56 476 56 476 56 476 35 78 91 130 33 6 90 499 92 = 0.21); P=	1167 385 884 1245 1169 703 250 7949 = 1% 298 385 884 1169 1063 649 119 1261 5828 = 27%	12 42 84 125 69 7 4 114 57 563 15 13 51 180 132 52 6 81	190 450 1243 2345 693 122 165 1264 715 8347 154 450 2345 1056 651 59 1264 6169	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 2.6% 24.7% 0.8% 3.1% 5.5% 6.0% 2.4% 3.7% 2.4%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.80 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.63] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39] 0.86 [0.76, 0.97] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.01 [0.80, 1.29] 0.86 [0.72, 1.47] 1.05 [0.17, 1.47] 1.11 [0.83, 1.49] 0.96 [0.85, 1.08]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \ge 3 years BIODEORADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIORESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT SUBIOTAL (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 At 5 years BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIOSCIENCE BIOSCIENCE BIOSCIENCE BIOSCIENCE BIOSTEMI DESSOLVE II SORT OUT VII SORT OVERIS Heterogeneity: Chi ² = 9.65, df = 7 (P Test for overall effect: Z = 0.85 (P = 0 Total (95% CI)	(P = 0.39); 0.005) 32 29 45 56 59 15 2 107 56 476 * = 0.43); P= 0.01) 36 35 78 91 130 333 6 90 499 * = 0.21); P= 0.51)	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1% 298 385 884 1169 1063 649 119 1261 5828	12 42 84 125 69 7 4 114 57 563 15 13 51 180 132 52 6 81 530	190 450 1243 2345 693 122 165 1264 715 8347 154 450 2345 1056 651 59 1264 6169	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 2.6% 2.6% 24.7% 0.8% 3.1% 5.5% 6.0% 2.4% 0.4% 3.7%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.80 [0.66, 1.22] 0.84 [0.61, 1.21] 0.50 [0.44, 2.50] 0.50 [0.09, 2.68] 0.94 [0.73, 1.21] 0.98 [0.76, 0.97] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.31 [0.70, 2.19] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.01 [0.80, 1.29] 0.98 [0.78, 1.23] 0.64 [0.42, 0.97] 1.51 [0.83, 1.49]	
Heterogeneity: $Chi^2 = 12.68$, $df = 12$ Test for overall effect: $Z = 2.83$ (P = 0 1.7.3 \ge 3 years BIODEORADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-V BIOFLOW-V BIORESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT Subtotal (95% CI) Total events Heterogeneity: $Chi^2 = 9.13$, $df = 9$ (P Test for overall effect: $Z = 2.54$ (P = 0 1.7.5 At 5 years BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOSCIENCE BIOSTEMI DESSOLVE II SORT OUT VII Subtotal (95% CI) Total events Heterogeneity: $Chi^2 = 9.65$, $df = 7$ (P Test for overall effect: $Z = 0.65$ (P = 0 Total events	(P = 0.39); 0.005) 32 29 45 56 56 56 56 15 2 107 56 476 * = 0.43); P = 0.01) 36 35 78 91 130 33 33 6 90 499 * = 0.21); P = 0.51)	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1% 298 385 884 1169 1083 649 119 1261 5828 = 27% 38057	12 42 84 125 69 7 4 114 57 563 15 13 51 180 132 52 6 81	190 450 1243 2345 693 122 165 1264 715 8347 154 450 2345 1056 651 59 1264 6169	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 2.6% 24.7% 0.8% 3.1% 5.5% 6.0% 2.4% 3.7% 2.4%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.80 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.63] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39] 0.86 [0.76, 0.97] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.01 [0.80, 1.29] 0.86 [0.72, 1.47] 1.05 [0.17, 1.47] 1.11 [0.83, 1.49] 0.96 [0.85, 1.08]	
Heterogeneity: Chi ² = 12.68, df = 12 Test for overall effect: Z = 2.83 (P = 0 1.7.3 \ge 3 years BIODEORADE BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIORESORT DESSOLVE III ORIENT PRISON IV SORT OUT VII TALENT SUBIOTAL (95% CI) Total events Heterogeneity: Chi ² = 9.13, df = 9 (P Test for overall effect: Z = 2.54 (P = 0 1.7.5 At 5 years BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW-IV BIOFLOW V BIOSCIENCE BIOSCIENCE BIOSCIENCE BIOSCIENCE BIOSTEMI DESSOLVE II SORT OUT VII SORT OVERIS Heterogeneity: Chi ² = 9.65, df = 7 (P Test for overall effect: Z = 0.85 (P = 0 Total (95% CI)	(P = 0.39); 0.005) 32 29 45 575 566 575 566 476 *= 0.43); P= 0.01) 36 35 78 90 499 *= 0.21); P= 0.51)	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 1% 298 385 884 1169 1083 649 119 1261 5828 = 27% 38057	12 42 84 125 69 7 4 114 57 563 15 13 51 180 132 52 6 81 530	190 450 1243 2345 693 122 165 1264 715 8347 154 450 2345 1056 651 59 1264 6169	0.7% 2.5% 3.8% 3.2% 0.4% 0.2% 2.6% 24.7% 0.8% 3.1% 5.5% 6.0% 2.4% 3.7% 2.4%	1.19 [0.62, 2.28] 0.55 [0.36, 0.82] 0.89 [0.66, 1.20] 0.80 [0.66, 1.22] 0.84 [0.61, 1.17] 1.05 [0.44, 2.63] 0.50 [0.09, 2.69] 0.94 [0.73, 1.21] 0.98 [0.68, 1.39] 0.86 [0.76, 0.97] 1.33 [0.72, 2.45] 0.78 [0.56, 1.09] 1.01 [0.80, 1.29] 0.86 [0.72, 1.47] 1.05 [0.17, 1.47] 1.11 [0.83, 1.49] 0.96 [0.85, 1.08]	

Fig. 7 Forest plot of target vessel revascularization (TVR) from 1 to 5 years follow-up

itudy or Subgroup	Ultrathin Events	Total	Standard 2 Events		Weight	Risk Ratio M-H, Fixed, 95% Cl	Risk Ratio M-H, Fixed, 95% Cl
.2.1 ≥ 1 year						.,,	
NODEGRADE	24	1167	26	1160	0.9%	0.92 [0.53, 1.59]	_ _
	24	298	20	154	0.9%		
BIOFLOW-II						1.55 [0.16, 14.78]	
BIOFLOW-IV	6	372	4	181	0.2%	0.73 [0.21, 2.55]	
BIOFLOWV	7	837	6	428	0.3%	0.60 [0.20, 1.76]	
BIOFLOW-VI	2	220	0	220	0.0%	5.00 [0.24, 103.55]	
BIONYX	26	1245	20	1243	0.7%	1.30 [0.73, 2.31]	
IO-RESORT	19	1169	39	2345	0.9%	0.98 [0.57, 1.68]	
	34	1063	27	1056	1.0%		
IOSCIENCE						1.25 [0.76, 2.06]	
IOSTEMI	24	649	22	651	0.8%	1.09 [0.62, 1.93]	
luccheri et al. 2021 (SCAAR)	339	4561	5197	69570	22.9%	0.99 [0.90, 1.11]	†
ASTLE	16	722	15	718	0.5%	1.06 [0.53, 2.13]	
ESSOLVE-C	1	216	5	212	0.2%	0.20 [0.02, 1.67]	
ESSOLVE II	2	117	2	60	0.1%	0.51 [0.07, 3.55]	
ESSOLVE III	25	703	18	695	0.6%	1.37 [0.76, 2.49]	
neriT-V	1	168	0	84	0.0%	1.51 [0.06, 36.65]	
RIENT	4	250	1	122	0.0%	1.95 [0.22, 17.28]	
RISON IV	1	165	3	165	0.1%	0.33 [0.04, 3.17]	
ORT OUT IX	43	1579	31	1572	1.1%	1.38 [0.87, 2.18]	
	38		28	1264	1.0%		
ORT OUT VII		1261				1.36 [0.84, 2.20]	
ALENT	14	720	4	715	0.1%	3.48 [1.15, 10.51]	
'amaji et al. 2018 (CARDIOBASE)	55	1451	75	1451	2.7%	0.73 [0.52, 1.03]	
subtotal (95% CI)		18933		84066	34.3%	1.02 [0.94, 1.11]	•
otal events	684		5524				
leterogeneity: Chi ² = 20.63, df = 20 est for overall effect: Z = 0.48 (P = 0		I ² = 3%					
.2.2 ≥ 2 years							
BIOFLOW-IV	11	385	5	190	0.2%	1.09 [0.38, 3.08]	
IOFLOWV	16	828	9	414	0.4%	0.89 [0.40, 1.99]	
BIONYX	47	1245	35	1243	1.3%	1.34 [0.87, 2.06]	<u> </u>
IO-RESORT	30	1169	73	2345	1.7%	0.82 [0.54, 1.25]	
IOSCIENCE	62	1063	42	1056	1.5%	1.47 [1.00, 2.15]	
IOSTEMI	27	649	25	651	0.9%	1.08 [0.64, 1.85]	
luccheri et al. 2021 (SCAAR)	339	4561	5197	69570	22.9%	0.99 [0.90, 1.11]	+
ESSOLVE II	3	120	1	60	0.0%	1.50 [0.16, 14.12]	
ESSOLVE III	38	703	28	695	1.0%	1.34 [0.83, 2.16]	
neriT-V	2	168	0	84	0.0%	2.51 [0.12, 51.80]	
RIENT	5	250	3	122	0.1%	0.81 [0.20, 3.35]	
ORT OUT IX	68	1579	64	1572	2.3%	1.06 [0.76, 1.48]	+-
ORT OUT VII	60	1261	45	1264	1.6%	1.34 [0.92, 1.95]	<u> </u>
	18				0.8%		
	18	720	21	715		0.85 [0.46, 1.58]	
Subtotal (95% CI)		14701		79981	34.8%	1.05 [0.96, 1.14]	Ţ
'otal events							
	726		5548				
leterogeneity: Chi² = 10.18, df = 13 fest for overall effect: Z = 1.09 (P = 0	(P = 0.68);	I ² = 0%	5548				
est for overall effect: Z = 1.09 (P = 0	(P = 0.68);	I ^z = 0%	5548				
est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years	(P = 0.68); 0.27)			4400	4.0%	0.00 10 50 4 67	
est for overall effect: Z = 1.09 (P = 0 . 2.3 ≥ 3 years IODEGRADE	(P = 0.68); 0.27) 44	1167	51	1160	1.8%	0.86 [0.58, 1.27]	
est for overall effect: Z = 1.09 (P = 0 . 2.3 ≥ 3 years IODEGRADE	(P = 0.68); 0.27)			1160 190	1.8% 0.5%	0.86 [0.58, 1.27] 0.67 [0.32, 1.44]	
est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IIODEGRADE IIOFLOW-IV	(P = 0.68); 0.27) 44	1167	51				
est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IODEGRADE IOFLOW-IV IOFLOW V	(P = 0.68); 0.27) 44 15	1167 385	51 11	190	0.5%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42]	
est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IODEGRADE IOFLOW-IV IOFLOW V IONYX	(P = 0.68); 0.27) 44 15 26 67	1167 385 884 1245	51 11 17 45	190 450 1243	0.5% 0.8% 1.6%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15]	
est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IODEGRADE IOFLOW-IV IOFLOW V IONVX IO-RESORT	(P = 0.68); 0.27) 44 15 26 67 53	1167 385 884 1245 1169	51 11 17 45 109	190 450 1243 2345	0.5% 0.8% 1.6% 2.6%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34]	
est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IODEORADE IOFLOW-IV IOFLOW V IONYX IONYX IO-RESORT IESSOLVE III	(P = 0.68); 0.27) 44 15 26 67 53 55	1167 385 884 1245 1169 703	51 11 17 45 109 49	190 450 1243 2345 693	0.5% 0.8% 1.6% 2.6% 1.8%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60]	
est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IODEGRADE IOFLOW-IV IOFLOW V IONYX IO-RESORT IESSOLVE III RIENT	(P = 0.68); 0.27) 44 15 26 67 53 55 9	1167 385 884 1245 1169 703 250	51 11 17 45 109 49 4	190 450 1243 2345 693 122	0.5% 0.8% 1.6% 2.6% 1.8% 0.2%	0.67 (0.32, 1.44) 0.78 (0.43, 1.42) 1.49 (1.03, 2.15) 0.98 (0.71, 1.34) 1.11 (0.76, 1.60) 1.10 (0.34, 3.49)	
est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IODEGRADE IOFLOW-IV IOFLOW V IONYX IO-RESORT IESSOLVE III RIENT	(P = 0.68); 0.27) 44 15 26 67 53 55	1167 385 884 1245 1169 703	51 11 17 45 109 49	190 450 1243 2345 693	0.5% 0.8% 1.6% 2.6% 1.8%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60]	
iest for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IIODEORADE IIOFLOW-IV IIOFLOW V IIOFLOW V IIORYX IIO-RESORT IESSOLVE III RIENT RIENT	(P = 0.68); 0.27) 44 15 26 67 53 55 9	1167 385 884 1245 1169 703 250	51 11 17 45 109 49 4	190 450 1243 2345 693 122	0.5% 0.8% 1.6% 2.6% 1.8% 0.2%	0.67 (0.32, 1.44) 0.78 (0.43, 1.42) 1.49 (1.03, 2.15) 0.98 (0.71, 1.34) 1.11 (0.76, 1.60) 1.10 (0.34, 3.49)	
est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IODEORADE IOFLOW-IV IOFLOW V IOREVV IONYX IONYX IONYX IORESORT ISSON IV RIENT RISON IV IORT OUT VII	(P = 0.68); 0.27) 44 15 26 67 53 55 9 4 88	1167 385 884 1245 1169 703 250 165 1261	51 11 17 45 109 49 4 8 74	190 450 1243 2345 693 122 165 1264	0.5% 0.8% 1.6% 2.6% 1.8% 0.2% 0.3% 2.6%	0.67 (0.32, 1.44) 0.78 (0.43, 1.42) 1.49 (1.03, 2.15) 0.98 (0.71, 1.34) 1.11 (0.76, 1.60) 1.10 (0.34, 3.49) 0.50 (0.15, 1.63) 1.19 (0.88, 1.61)	
est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IODEGRADE IOFLOW-IV IOFLOW V IONYX IO-RESORT .essoLVE III RIENT RISON IV ORT OUT VII ALENT	(P = 0.68); 0.27) 44 15 26 67 53 55 9 4	1167 385 884 1245 1169 703 250 165 1261 720	51 11 17 45 109 49 4 8	190 450 1243 2345 693 122 165 1264 715	0.5% 0.8% 1.6% 2.6% 1.8% 0.2% 0.3% 2.6% 1.2%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.10 [0.34, 3.49] 0.50 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42]	
est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IODEGRADE IODEGWVIV IOFLOWV IOROVV IORESORT SSOLVE III RIENT RISON IV ORT OUT VII ALENT ubtotal (95% CI)	(P = 0.68); 0.27) 44 15 26 67 53 55 9 4 88 83 30	1167 385 884 1245 1169 703 250 165 1261	51 11 17 45 109 49 4 8 74 34	190 450 1243 2345 693 122 165 1264	0.5% 0.8% 1.6% 2.6% 1.8% 0.2% 0.3% 2.6%	0.67 (0.32, 1.44) 0.78 (0.43, 1.42) 1.49 (1.03, 2.15) 0.98 (0.71, 1.34) 1.11 (0.76, 1.60) 1.10 (0.34, 3.49) 0.50 (0.15, 1.63) 1.19 (0.88, 1.61)	
	(P = 0.68); 0.27) 44 15 26 67 53 55 9 4 88 30 391 = 0.38); P =	1167 385 884 1245 1169 703 250 165 1261 720 7949	51 11 17 45 109 49 4 8 74	190 450 1243 2345 693 122 165 1264 715	0.5% 0.8% 1.6% 2.6% 1.8% 0.2% 0.3% 2.6% 1.2%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.10 [0.34, 3.49] 0.50 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42]	
est for overall effect: Z = 1.09 (P = 0 2.3 ≥ 3 years IODEORADE IODEORADE IODEOW/IV IOROWV IORESORT IORYX IORESORT IESONIV IIISONIV IN	(P = 0.68); 0.27) 44 15 26 67 53 55 9 4 88 30 391 = 0.38); P =	1167 385 884 1245 1169 703 250 165 1261 720 7949	51 11 17 45 109 49 4 8 74 34	190 450 1243 2345 693 122 165 1264 715	0.5% 0.8% 1.6% 2.6% 1.8% 0.2% 0.3% 2.6% 1.2%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.10 [0.34, 3.49] 0.50 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42]	
est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IODEORADE IOFLOW-IV IOFLOW V IOFRESORT IORES	(P = 0.68);).27) 44 15 26 67 53 55 9 4 88 30 391 = 0.38); P 5.58)	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 7%	51 11 17 45 109 49 4 8 74 34 34	190 450 1243 2345 693 122 165 1264 715 8347	0.5% 0.8% 1.6% 2.6% 1.8% 0.2% 0.3% 2.6% 1.2% 13.5 %	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.10 [0.34, 3.49] 0.50 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42] 1.04 [0.91, 1.19]	
est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IIODEORADE IIODEORADE IIOFLOW-IV IIOFLOW-V IIORTSORT IIORSORT IIORSORT IIORSORT IIORTOUT VII ALENT IIIORTOUT VIII IIIORTOUT VII ALENT IIIORTOUT VII ALENT IIIORTOUT VII ALENT IIIORTOUT VII IIIORTOUT VII IIIORTOUT VII IIIORTOUT VII IIIORTOUT VII IIIORTOUT VII IIIORTOUT VII IIIORTOUT VII IIORTOUT VII IIO	(P = 0.68);).27) 44 15 26 67 53 55 9 4 88 30 391 = 0.38); P : 0.58)	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 7%	51 11 17 45 109 4 8 74 34 402 14	190 450 1243 2345 693 122 165 1264 715 8347	0.5% 0.8% 1.6% 2.6% 0.2% 0.3% 2.6% 1.2% 13.5 %	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.10 [0.34, 3.49] 0.50 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42] 1.04 [0.91, 1.19]	
est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IODEORADE IODEORADE IODEORADE IODEORVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOORTOVIV IOOFLOVVIV	(P = 0.68);).27) 44 15 26 67 53 55 9 4 88 30 391 = 0.38); (P:).58)	1167 385 884 1245 703 250 1261 720 7949 = 7%	51 11 17 45 109 4 8 74 34 402 14	190 450 1243 2345 693 122 165 1264 715 8347 154 154	0.5% 0.8% 1.6% 2.6% 0.2% 0.3% 2.6% 1.2% 13.5%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.10 [0.34, 3.49] 0.50 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42] 1.04 [0.91, 1.19] 0.52 [0.25, 1.06] 0.69 [0.36, 1.31]	
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est for overall effect: Z = 1.09 (P = 0 2.3 ≥ 3 years IODEORADE IODEORADE IODEOW/IV IOREVV IORESORT IORYX IORESORT IOSESORT I	(P = 0.68);).27) 44 15 26 67 53 55 9 4 88 30 391 = 0.38); (P:).58)	1167 385 884 1245 703 250 1261 720 7949 = 7%	51 11 17 45 109 4 8 74 34 402 14	190 450 1243 2345 693 122 165 1264 715 8347 154 154	0.5% 0.8% 1.6% 2.6% 0.2% 0.3% 2.6% 1.2% 13.5%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.10 [0.34, 3.49] 0.50 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42] 1.04 [0.91, 1.19] 0.52 [0.25, 1.06] 0.69 [0.36, 1.31]	
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iest for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IIODEORADE IIODEORADE IIOFLOW-IV IIOFLOW-IV IIOFLOW-V IIORTOUT VII ALENT whotal (95% CI) otal events leterogeneity: Chi ² = 9.70, df = 9 (P est for overall effect: Z = 0.55 (P = 0 .2.5 At 5 years IIOFLOW-II IIOFLOW-II IIOFLOW-IV IIOFLOW-V IIOFRESORT IIORRESORT IIORCESORT	(P = 0.68);).27) 44 15 26 67 53 59 4 88 30 391 = 0.38); P : 0.58) 14 21 56 92 139	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 7% 298 385 884 1169 1063	51 11 17 45 109 4 8 74 34 402 14 15 27 191 105	190 450 1243 2345 693 122 165 1264 715 8347 154 190 450 2345 1056	0.5% 0.8% 1.6% 2.6% 0.3% 2.6% 1.2% 1.2% 1.2% 0.7% 0.7% 1.3% 4.5% 3.8%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.10 [0.34, 3.49] 0.50 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42] 1.04 [0.91, 1.19] 0.52 [0.25, 1.06] 0.69 [0.36, 1.31] 1.06 [0.68, 1.65] 0.97 [0.76, 1.23] 1.32 [1.04, 1.67]	
est for overall effect: Z = 1.09 (P = 0 2.3 ≥ 3 years IODEORADE IODEORADE IODEORADE IODEOWIV IORESORT IORTX IORTSOLVE III RIENT RISON IV IORT OUT VII ALENT Uutotal (95% CI) Total events Ieterogeneity: Chi ² = 9.70, df = 9 (P est for overall effect: Z = 0.55 (P = 0 .2.5 At 5 years IIOFLOWIV IOFLOWIV IOFLOWV IORESORT IOSCIENCE IOSCIENCE IOSTEMI	(P = 0.68);).27) 444 16 26 67 53 555 9 4 88 30 391 = 0.38); P 50 558) 14 20 558) 14 20 56 92 139 46	1167 385 884 1245 1169 703 250 165 1261 7949 = 7% 298 385 884 1169 1063 649	51 11 17 45 109 4 8 74 34 402 402 14 15 27 191 105 27 191 105 46	190 450 1243 2345 693 122 165 1264 715 8347 154 450 2345 1056 651	0.5% 0.8% 1.6% 2.6% 0.2% 0.2% 0.2% 1.2% 13.5% 0.7% 1.3% 4.5% 3.8% 3.8%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.10 [0.34, 3.49] 0.50 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42] 1.04 [0.91, 1.19] 0.52 [0.25, 1.06] 0.69 [0.36, 1.31] 1.06 [0.68, 1.65] 0.97 [0.76, 1.23] 1.32 [1.04, 1.67] 1.00 [0.68, 1.49]	
est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IIODEORADE IIODEORADE IIOFLOW-IV IIOFLOW-IV IIORYX IIORESORT IIORESORT IIORESORT IIOREON IV IIOREON IV IIORESORT IIOSTEMI IIOSTEMI IIOSTEMI IIOSTEMI IIOSTEMI	(P = 0.68);).27) 444 15 26 67 53 55 9 4 88 30 391 = 0.38); P : 0.58) 144 21 565 92 139 46 11	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 7% 298 385 884 1169 1063	51 11 17 45 109 4 8 74 34 402 14 15 27 191 105	190 450 1243 2345 693 122 165 1264 715 8347 154 190 450 2345 1056	0.5% 0.8% 1.6% 2.6% 0.2% 0.3% 2.6% 1.2% 13.5% 0.7% 1.3% 4.5% 3.8% 1.6% 3.8%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.00 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42] 1.04 [0.91, 1.19] 0.52 [0.25, 1.06] 0.69 [0.36, 1.31] 1.06 [0.68, 1.65] 0.97 [0.76, 1.23] 1.32 [1.04, 1.67] 1.00 [0.68, 1.49] 0.51 [0.35, 2.34]	
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est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IIODEORADE IIODEORADE IIOFLOW-IV IIOFLOW-V IIORTOV IIORTSORT VESSOLVE III IIIORTOUT VII ALENT IIIORTOUT VII ALENT IIIORTOUT VII Est for overall effect: Z = 0.55 (P = 0 .2.5 At 5 years IIOFLOW-IV IIOFLOW-IV IIOFLOW-IV IIOFLOW-V IIOFLOWVEII IIOFLOWVEII IIORRESORT IIORRESORT IIOSCIENCE IIOSTOUT VII IESSOLVE II IIORTOUT VII	(P = 0.68);).27) 444 15 26 67 53 55 9 4 88 30 391 = 0.38); P : 0.58) 144 21 565 92 139 46 11	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 7% 298 385 884 1169 1063 649 119	51 11 17 45 109 49 4 8 74 34 34 402 14 15 27 191 105 46 6	190 450 1243 2345 693 122 165 1264 715 8347 154 190 450 2345 1056 651 59	0.5% 0.8% 1.6% 2.6% 0.2% 0.3% 2.6% 1.2% 13.5% 0.7% 1.3% 4.5% 3.8% 1.6% 3.8%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.10 [0.34, 3.49] 0.50 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42] 1.04 [0.91, 1.19] 0.52 [0.25, 1.06] 0.69 [0.36, 1.31] 1.06 [0.68, 1.65] 0.97 [0.76, 1.23] 1.32 [1.04, 1.67] 1.00 [0.68, 1.49] 0.95 [0.75, 1.20]	
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"est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years NOFLOW-IV NOFLOW-IV NOFLOW-IV NOFLOW-IV NOFLOW-IV NOFLOW-IV NOFLOW-IV PRISON IV SORT OUT VII ALENT NUDTOTAI (95% CI) Total events Horp Constant (95% CI) NOFLOW-IV NOFLOW	(P = 0.68);).27) 444 15 266 67 53 55 9 4 88 30 391 = 0.38); P 0.58) 14 21 50 50 9 48 48 83 30 391 = 0.38); P 14 21 50 50 9 2 139 46 11 20 50 50 50 50 50 50 50 50 50 50 50 50 50	1167 385 1169 703 250 165 1261 720 7949 = 7% 298 385 884 1169 1063 649 119 1261 5828	51 11 17 45 109 49 4 8 74 34 34 402 14 15 27 191 105 46 6	190 450 1243 2345 693 122 165 1264 715 8347 154 190 450 2345 8145 1056 651 59 1264	0.5% 0.8% 1.6% 2.6% 0.2% 0.2% 0.2% 1.2% 13.5% 0.7% 1.3% 4.5%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.10 [0.34, 3.49] 0.50 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42] 1.04 [0.91, 1.19] 0.52 [0.25, 1.06] 0.69 [0.36, 1.31] 1.06 [0.68, 1.65] 0.97 [0.76, 1.23] 1.32 [1.04, 1.67] 1.00 [0.68, 1.49] 0.95 [0.75, 1.20]	
est for overall effect: Z = 1.09 (P = 0 2.3 ≥ 3 years IIODEORADE IIODEORADE IIODEOWIV IIOFLOWIV IIOFLOWIV IIORX IIORESORT IIOREONIV IIORESORT IIORTOUT VII ALENT IIORTOUT VII ALENT IIOREOWIN IIOREOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOSTEMI DESSOLVE II DESSOLVE	(P = 0.68);).27) 444 15 266 67 53 55 9 4 88 30 391 = 0.38); P 0.58) 14 21 50 50 9 48 48 83 30 391 = 0.38); P 14 21 50 50 9 2 139 46 11 20 50 50 50 50 50 50 50 50 50 50 50 50 50	1167 3854 1245 1169 703 250 165 1261 720 7949 = 7% 298 385 884 1169 1063 649 119 1261 5828 = 29%	51 11 17 45 109 49 4 8 74 34 402 14 15 27 191 105 27 191 105 46 6 127	190 450 1243 2345 693 122 165 1264 715 8347 154 450 2345 1056 651 59 1264 6169	0.5% 0.8% 1.6% 2.6% 1.2% 2.6% 1.2% 1.2% 1.3% 4.5% 3.8% 1.6% 3.8% 1.6% 3.8% 1.6% 1.6%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.10 [0.34, 3.49] 0.50 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42] 1.04 [0.91, 1.19] 0.52 [0.25, 1.06] 0.69 [0.36, 1.31] 1.06 [0.68, 1.65] 0.97 [0.76, 1.23] 1.02 [1.04, 1.67] 1.00 [0.68, 1.49] 0.91 [0.35, 2.34] 0.95 [0.75, 1.20] 1.02 [0.90, 1.15]	
est for overall effect: Z = 1.09 (P = 0 2.3 ≥ 3 years IIODEORADE IIODEORADE IIODEOWIV IIOFLOWIV IIOFLOWIV IIORX IIORESORT IIOREONIV IIORESORT IIORTOUT VII ALENT IIORTOUT VII ALENT IIOREOWIN IIOREOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOFLOWIN IIOSTEMI DESSOLVE II DESSOLVE	(P = 0.68);).27) 444 15 266 67 53 55 9 4 88 30 391 = 0.38); P 0.58) 14 21 50 50 9 48 48 83 30 391 = 0.38); P 14 21 50 50 9 2 139 46 11 20 50 50 50 50 50 50 50 50 50 50 50 50 50	1167 385 1169 703 250 165 1261 720 7949 = 7% 298 385 884 1169 1063 649 119 1261 5828	51 11 17 45 109 49 4 8 74 34 402 14 15 27 191 105 27 191 105 46 6 127	190 450 1243 2345 693 122 165 1264 715 8347 154 190 450 2345 8145 1056 651 59 1264	0.5% 0.8% 1.6% 2.6% 1.2% 2.6% 1.2% 13.5% 0.7% 1.3% 4.5% 3.8% 1.6% 0.3% 4.5% 1.6%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.10 [0.34, 3.49] 0.50 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42] 1.04 [0.91, 1.19] 0.52 [0.25, 1.06] 0.69 [0.36, 1.31] 1.06 [0.68, 1.65] 0.97 [0.76, 1.23] 1.32 [1.04, 1.67] 1.00 [0.68, 1.49] 0.95 [0.75, 1.20]	
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est for overall effect: Z = 1.09 (P = 0 .2.3 ≥ 3 years IODEORADE IODEORADE IODEOW-IV IODEOW-IV IODEOR IODEOW IODEOR IODEOW IODEOR IODEOW IODEOR IODEOW	(P = 0.68);).27) 444 45 26 67 55 9 4 88 30 391 = 0.38); P 50 58) 14 21 56 92 139 46 11 120 499 = 0.19); P 50.78)	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 7% 298 385 884 1169 1063 649 1261 5828 = 29% 47411	51 11 17 45 109 49 4 8 74 34 402 14 15 27 191 105 46 6 127 531	190 450 1243 2345 693 122 165 1264 715 8347 154 450 2345 1056 651 59 1264 6169	0.5% 0.8% 1.6% 2.6% 1.2% 2.6% 1.2% 13.5% 0.7% 1.3% 4.5% 3.8% 1.6% 0.3% 4.5% 1.6%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.10 [0.34, 3.49] 0.50 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42] 1.04 [0.91, 1.19] 0.52 [0.25, 1.06] 0.69 [0.36, 1.31] 1.06 [0.68, 1.65] 0.97 [0.76, 1.23] 1.02 [1.04, 1.67] 1.00 [0.68, 1.49] 0.91 [0.35, 2.34] 0.95 [0.75, 1.20] 1.02 [0.90, 1.15]	
est for overall effect: $Z = 1.09$ (P = 0 2.3 \geq 3 years IODEGRADE IODEG	(P = 0.68);).27) 44 45 16 26 67 53 55 9 4 88 30 391 = 0.38); [P: 14 21 39 46 56 92 139 46 11 120 99 499 = 0.19); [P: 0.78)	1167 385 884 1245 1169 703 250 165 1261 720 7949 = 7% 298 385 884 1169 1063 649 1261 5828 = 29% 47411	51 11 17 45 109 49 4 8 74 34 402 14 15 27 191 105 46 6 127 531	190 450 1243 2345 693 122 165 1264 715 8347 154 450 2345 1056 651 59 1264 6169	0.5% 0.8% 1.6% 2.6% 1.2% 2.6% 1.2% 13.5% 0.7% 1.3% 4.5% 3.8% 1.6% 0.3% 4.5% 1.6%	0.67 [0.32, 1.44] 0.78 [0.43, 1.42] 1.49 [1.03, 2.15] 0.98 [0.71, 1.34] 1.11 [0.76, 1.60] 1.10 [0.34, 3.49] 0.50 [0.15, 1.63] 1.19 [0.88, 1.61] 0.88 [0.54, 1.42] 1.04 [0.91, 1.19] 0.52 [0.25, 1.06] 0.69 [0.36, 1.31] 1.06 [0.68, 1.65] 0.97 [0.76, 1.23] 1.02 [1.04, 1.67] 1.00 [0.68, 1.49] 0.91 [0.35, 2.34] 0.95 [0.75, 1.20] 1.02 [0.90, 1.15]	0.01 0.1 Favours Standard 2nd Gen

Fig. 8 Forest plot of all-cause mortality from 1 to 5 years follow-up

Figure number	Outcomes	Subgroup	Total number of patients	patients	Heterogeneity	eneity	Test for ov	Test for overall effect	Risk ratio	95%, CI
			Ultra-thin strut	Standard 2nd Gen	Chi2	df 12%	Z (value)	P (value)		
- m	TLF	At≥1 year	10,302	10,528	6.96	$14 \ (P=0.94) \ 0$	2.54	0.01	0.85	[0.75,0.96]
		At ≥2 years	9276	10,326	8.64	11 ($P = 0.65$) 0	3.02	0.003	0.86	[0.77,0.95]
		At≥3 years	7064	7467	10.71	7 (P=0.15) 35	2.68	0.007	0.85	[0.76,0.96]
		At 5 years	5828	6169	6.01	7 (P=0.54) 0	1.25	0.21	0.94	[0.85,1.04]
4	Cardiac death	At≥1 year	14,366	14,493	15.7	18 (P=0.61) 0	0	-	-	[0.82,1.22]
		At ≥2 years	10,129	10,404	4.8	11 (P=0.94) 0	1.1	0.27	1.12	[0.92,1.37]
		At≥3 years	7949	8347	5.68	9 (P=0.77) 0	0.24	0.81	1.03	[0.83,1.27]
		At 5 years	5993	6334	1.83	8 (<i>P</i> =0.99) 0	0.2	0.84	0.98	[0.82,1.17]
5	TVMI	At≥1 year	12,204	12,549	9.28	15 (P=0.86) 0	1.17	0.24	0.91	[0.77,1.07]
		At≥2 years	6870	7365	5.35	8 (P=0.72) 0	2.26	0.02	0.81	[0.68,0.97]
		At≥3 years	6273	6796	8.82	6 (P=0.18) 32	1.64	0.1	0.85	[0.70,1.03]
		At 5 years	5828	6169	10.47	7 (P=0.16) 33	0.74	0.46	0.94	[0.79,1.11]
9	TLR	At ≥1 year	18,712	83,848	30.22	19 (P=0.05) 37	2.4	0.02	0.79	[0.65,0.96]
		At ≥2 years	14,689	79,774	22.64	13 (P=0.05) 43	2.62	0.009	0.79	[0.67,0.94]
		At ≥3 years	7949	8347	22.1	9 (P = 0.009) 59	0.83	0.4	6.0	[0.70,0.1.15]
		At 5 years	5993	6334	10.83	8 (P=0.21) 26	0.24	0.81	0.98	[0.81,1.17]
7	TVR	At ≥1 year	14,152	14,278	15	17 (P=0.60) 0	2.29	0.02	0.87	[0.77,0.98]
		At ≥2 years	10,128	10,406	12.68	12 (P=0.39) 5	2.83	0.005	0.85	[0.76,0.95]
		At ≥3 years	7949	8347	9.13	9 (P=0.43) 1	2.54	0.01	0.86	[0.76,0.97]
		At 5 years	5828	6169	9.65	7 (P=0.21) 27	0.65	0.51	0.96	[0.83,0.94]
80	All-cause mortality	At ≥ 1 year	18,933	84,066	20.63	20 (P=0.42) 3	0.48	0.63	1.02	[0.94,1.11]
		At ≥ 2 years	14,701	79,981	10.18	13 (<i>P</i> =0.68) 0	1.09	0.27	1.05	[0.96,1.14]
		At ≥ 3 years	7949	9347	9.7	9 (P=0.38) 7	0.55	0.58	1.04	[0.91,1.19]
		At 5 years	5828	6169	9.92	7 (P=0.19) 29	0.28	0.78	1.02	[0.90,1.15]
S16	POCE	At ≥ 1 year	12,320	13,016	15.32	14 (P=0.36) 9	0.42	0.67	1.02	[0.94,1.10]
		At ≥ 2 years	7756	8589	6.1	8 (<i>P</i> =0.64) 0	0.22	0.82	1.01	[0.94,1.09]
		At ≥ 3 years	5655	6489	11.91	6 (P=0.06) 50	1.01	, -	-	[0.89,1.13]
		At 5 years	4825	5660	2.35	5 (P = 0.80) 0	0.81	0.42	1.03	[0.96,1.11]
S18	Any MI	At ≥ 1 year	18,928	84,063	23.98	20 (P=0.24) 17	0.19	0.85	0.99	[0.89,1.10]
		At ≥ 2 years	15,596	79,979	11.41	13 (P=0.58) 0	1.58	0.11	0.93	[0.85,1.02]
		At≥3 years	7949	8347	11.84	9 (P=0.22) 24	0.86	0.39	0.94	[0.80,1.09]
		At 5 years	5993	6334	8.66	8 (P=0.37) 8	0.71	0.48	0.95	[0.83,1.09]

Figure number	Outcomes	Subgroup	Total number of patients	patients	Hetero	Heterogeneity	Test for ov	Test for overall effect	Risk ratio	95%, CI
			Ultra-thin strut	Standard 2nd Gen	Chi2	df 12%	Z (value)	P (value)		
S22	Repeat revascularization	At≥1 year	8648	9668	9.05	9 (P=0.43) 1	0.19	0.85	0.99	[0.87,1.12]
		At ≥ 2 years	5795	6822	9.91	6 (<i>P</i> =0.13) 39	0.46	0.65	0.97	[0.83,1.12]
		At≥3 years	5250	6273	9.44	5 (P=0.09) 47	0.94	0.35	0.93	[0.79,1.09]
		At 5 years	2881	4052	2.63	2 (<i>P</i> =0.27) 24	0.83	0.41	0.94	[0.82,1.09]
S24	Definite or probable stent thrombosis	At≥1 year	18,927	84,062	10.96	15 (P = 0.76) 0	0.86	0.39	0.92	[0.76,1.11]
		At ≥2 years	14,437	79,851	10.8	12 (P=0.55) 0	1.54	0.12	0.86	[0.71,1.04]
		At≥3 years	6367	0069	6.93	6 (P=0.33) 13	0.16	0.87	0.98	[0.75,1.27]
		At 5 years	5828	6169	9.74	7 (P=0.20) 28	1.53	0.13	0.83	[0.66,1.05]
S27	Definite stent thrombosis	At≥1 year	10,969	11,570	11.46	9 (P=0.25) 21	0.02	0.98	-	[0.72,1.40]
		At≥2 years	9203	9947	8.35	4 (P=0.40) 4	0.64	0.52	0.91	[0.67,1.23]
		At≥3 years	5805	6606	7.97	5 (P=0.16) 37	0.04	0.97	1.01	[0.66,1.54]
		At 5 years	4440	5470	4.46	4 (<i>P</i> =0.35) 10	0.12	0.91	0.98	[0.70,1.38]
S29	Probable stent thrombosis	At ≥1 year	8815	9424	2.87	6 (P=0.82) 0	1.31	0.19	0.76	[0.50,1.15]
		At ≥2 years	7958	8704	6.33	7 (P=0.50) 0	1.61	0.11	0.76	[0.54,1.06]
		At ≥3 years	3391	4156	0.43	2 (P=0.81) 0	0.46	0.65	1.24	[0.50,3.07]
		At 5 years	4440	5470	0.3	2 (P=0.86) 0	0.44	0.66	0.92	[0.64,1.32]
S30	Bleeding	At ≥1 year	3847	3702	2.15	4 (P=0.71) 0	0.39	0.7	1.06	[0.80,1.40]
		At ≥2 years	1958	1824	1.23	2 (P=0.54) 0	0.16	0.88	0.97	[0.70,1.35]
		At ≥3 years	1413	1277	0.94	$1 \ (P=0.33) \ 0$	0.09	0.93	1.02	[0.67,1.54]
		At 5 years	1712	1707	0.01	1 (P=0.92) 0	0.63	0.53	1.1	[0.81,1.50]

diameter, minimizing the risk of periprocedural myocardial infarction and, as a result, the incidence of TVMI [71].

The lack of a significant difference in all-cause mortality or even cardiac death between ultrathin DES and standard-thickness DES could be attributed to other contributing factors than the stent design, such as clinical, anatomical, and local pathophysiological lesion characteristics.

The findings of this study are consistent with previous research [13, 71, 72], showing that even minor changes in strut thickness, ranging from 20 to 30 mm, may be sufficient to produce unique stent-related outcomes in newergeneration DES in routine clinical settings. Our study's effect on TLF aligns with the results of previously published meta-analyses [14, 72–74] except for Li et al., 2023 which showed no difference, and a smaller sample size can explain this. Our study is the first meta-analysis to compare the two groups regarding POCE and reported revascularization, and it showed no statistically significant difference between the two groups. Our results align with the previous meta-analyses [14, 72-74], which showed no statistically significant difference in all-cause mortality, cardiac mortality, and definite or probable ST outcomes.

The lower TLR in our study is contrary to the study by Madhavan [72], Monjur [73], Iglesias [74], and Li [75] results and in line with Hussain [14] which showed a significant reduction in TLR (RR, 0.85; 95% CI 0.72–1.00; P=0.04) at 2 years.

Notably, while ultrathin-strut stents showed promising effects in the short term, their benefits may not be consistent over a more extended time. In our meta-analysis, there was no significant different in terms of TLF when we compared the two groups at ≥ 5 years. These findings might have a substantial implication on stent selection in clinical practice, particularly in patients at high risk of late and very late stent failure and requires more clinical trials to evaluate the long-term effect of ultrathin stent struts.

Study limitations

This study has some limitations that affect the applicability of the study's conclusions. The absence of specific patient data from the chosen trials limits the use of advanced statistical techniques, including multivariable and subgroup analyses, which hinders the investigation of variations in the initial characteristics between groups of patients receiving DES. Despite these drawbacks, the research offers insightful information about the state of research on ACS. The open-label design of the included studies presents possible confounders. This absence of blinding could introduce a potential source of bias by influencing intravascular imaging guiding and vessel preparation techniques between DES treatment groups. Also, the meta-analysis design has some intrinsic limitations, such as the reliance on aggregate study-level data, which limits the comparison depth compared to patientlevel data. Patient-level analysis could enhance subgroup detection, providing a more nuanced understanding of the study outcomes. The SCAAR registry contributed to the large sample size of our study. This registry collected clinical data and procedural characteristics of all consecutive patients undergoing cardiac catheterization in Sweden, which may have influenced our overall results.

Conclusion

This meta-analysis showed the non-inferiority of ultrathin stent DES compared to standardized thickness DES regarding clinical outcomes such as all-cause mortality, cardiac mortality, MI, and probable or definite stent thrombosis. Additionally, ultrathin stent DES appears superior to the control group regarding TLF in short-term outcomes extending up to 3 years from PCI.

Abbreviations

- ACS Acute coronary syndrome
- CCS Chronic coronary syndrome
- DES Drug-eluting stents
- MI Myocardial infarction
- PCI Percutaneous coronary intervention
- POCE Patient-oriented composite endpoint
- RCTs Randomized controlled trials
- ST Stent thrombosis
- TLF Target lesion failure
- TLRTarget lesion revascularizationTVRTarget vessel revascularization
- TVMI Target vessel myocardial infarction

Supplementary Information

The online version contains supplementary material available at https://doi.org/10.1186/s40001-024-01949-7.

Supplementary Material 1. Table S1: Search strategy. Table S2: Summary characteristics. Table S3: More details of stent characteristics. Table S4: Sensitivity analysis. Figure S1: Funnel plot of TLF at \geq 1 year. Figure S2: Funnel plot of TLF at \geq 2 years. Figure S3: Funnel plot of Cardiac death at \geq 1 year. Figure S4: Funnel plot of Cardiac death at \geq 2 years. Figure S5: Funnel plot of Cardiac death at ≥ 3 years. Figure S6: Funnel plot of Target Vessel-Related Myocardial Infarction at \geq 1 year. Figure S7: Funnel plot of TLR at \geq 1 year. Figure S8: Funnel plot of TLR at \geq 2 years. Figure S9: Funnel plot of TLR at ≥ 3 years. Figure S10: Funnel plot of TVR at ≥ 1 year. Figure S11: Funnel plot of TVR at > 2 years. Figure S12: Funnel plot of TVR at > 3 years. Figure S13: Funnel plot of all-cause mortality at ≥ 1 year. Figure S14: Funnel plot of all-cause mortality at \geq 2 years. Figure S15: Funnel plot of all-cause mortality at ≥ 3 years. Figure S16: Forest plot of patientoriented composite endpoint. Figure S17: Funnel plot of patient-oriented composite endpoint at ≥ 1 year. Figure S18: Forest plot of any myocardial infarction. Figure S19: Funnel plot of any myocardial infarction at \geq 1 year. Figure S20: Funnel plot of any myocardial infarction at \geq 2 years. Figure S21: Funnel plot of any myocardial infarction at \geq 3 years. Figure S22: Forest plot of any repeat revascularization. Figure S23: Funnel plot of any repeat revascularization at ≥ 1 year. Figure S24: Forest plot of any definite or probable stent thrombosis. Figure S25: Funnel plot of any definite or

probable stent thrombosis at \geq 1 year. Figure S26: Funnel plot of any definite or probable stent thrombosis at \geq 2 years. Figure S27: Forest plot of definite stent thrombosis. Figure S28: Funnel plot of any definite stent thrombosis at \geq 1 year. Figure S29: Forest plot of probable stent thrombosis. Figure S30: Forest plot of bleeding. Figure S31A: TLF subgroup analysis at 1 year. Figure S31B: TLF subgroup analysis at 5 year.

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Author contributions

Ahmed Hassan developed the research question, search strategies, and registration of study protocols and helped with screening, writing the introduction, and preparing the manuscript. Ahmed Mazen Amin made a meta-analysis and wrote the results. Ahmed Farid Gadelmawla and Ahmed Mansour are the co-third authors who contributed equally to the screening, data extraction, writing the methods and discussion. Hamed Abdelma'aboud Mostafa and Mariam Tarek Desouki are the co-fourth authors who contributed equally to the data extraction, tables, quality assessment and writing the abstract. Mostafa Mahmoud Naguib helped in screening, quality assessment, and arranging the reference. Bilal Ali, Aisha Sirag, and Mustafa Suppah reviewed the manuscript. Diaa Hakim is the project's leader, guided all project steps and reviewed the manuscript.

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Availability of data and materials

No datasets were generated or analysed during the current study.

Declarations

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Competing interests

The authors declare no competing interests.

Author details

¹ Faculty of Medicine, October 6 University, Giza, Egypt. ²Department of Cardiology, Suez Medical Complex, Ministry of Health and Population, Suez, Egypt. ³ Faculty of Medicine, Mansoura University, Mansoura, Egypt. ⁴ Faculty of Medicine, Menoufia University, Menoufia, Egypt. ⁵ Faculty of Medicine, Al-Azhar University, Cairo, Egypt. ⁶ Faculty of Medicine, Al-Azhar University, Damietta, Egypt. ⁷ Faculty of Medicine, Alexandria University, Alexandria, Egypt. ⁸ University Hospitals Cleveland Medical Center, Case Western Reserve University, Cleveland, OH, USA. ⁹ MetroHealth Medical Center, Case Western Reserve University, Cleveland Heights, OH, USA. ¹⁰ Department of Cardiology, Faculty of Medicine, Suez Canal University, Ismailia, Egypt.

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