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Long-term safety of bioresorbable scaffolds: insights from a network meta-analysis including 91 trials

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KEYWORDS

- bare metal stent
- bioresorbable scaffolds
- drug-eluting stent
- stent thrombosis

Abstract

Aims: The aim of this study was to investigate the long-term safety and efficacy of biodegradable scaffolds and metallic stents.

Methods and results: We analysed a total of 91 randomised controlled trials with a mean follow-up of 3.7 years in 105,842 patients which compared two or more coronary metallic stents or biodegradable scaffolds and reported the long-term clinical outcomes (≥2 years). Network meta-analysis showed that patients treated with the Absorb bioresorbable vascular scaffold (BVS) had a significantly higher risk of definite or probable scaffold thrombosis (ScT) compared to those treated with metallic DES. The risk of very late ScT was highest with the Absorb BVS among comparators. Pairwise conventional meta-analysis demonstrated that the elevated risk of ScT with Absorb BVS compared to cobalt-chromium everolimus-eluting stents was consistent across the time points of ≤30 days (early), 31 days – 1 year (late) and >1 year (very late) ScT. In addition, target lesion failure rates were significantly higher in the Absorb BVS cohort, driven by both increased risk of target vessel myocardial infarction and ischaemia-driven target lesion revascularisation.

Conclusions: Absorb BVS implantation was associated with increased risk of long-term and very late ScT compared to current-generation metallic DES. The risk of ScT occurred with a rising trend beyond one year. Systematic review registration: PROSPERO CRD42017055987.

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Abbreviations

ARC	Academic Research Consortium
BES	Biolimus A9-eluting stent
BMS	bare metal stent
BP	biodegradable polymer
BVS	bioresorbable vascular scaffold
CI	confidence interval(s)
CoCr	cobalt-chromium
DAPT	dual antiplatelet therapy
DES	drug-eluting stent
dual DES	polymer-free sirolimus- and probucol-eluting stent
EES	everolimus-eluting stent
E-ZES	Endeavor zotarolimus-eluting stent
H-SES	Orsiro hybrid SES
MI	myocardial infarction
OR	odds ratio(s)
PES	paclitaxel-eluting stent
PtCr-EES	platinum-chromium everolimus-eluting stent
R-ZES	Resolute zotarolimus-eluting stent
ScT	scaffold thrombosis
SES	sirolimus-eluting stent
ST	stent thrombosis
TLF	target lesion failure
TLR	target lesion revascularisation
TVR	target vessel revascularisation

Introduction

Bioresorbable coronary scaffolds were developed with the promise of overcoming the long-term clinical implications following deployment of permanent coronary metallic stents[1]. Despite recent design iterations of contemporary drug-eluting stents (DES), permanent metallic stent deployment entails the risk of late stent failure attributed to repeat target lesion revascularisation, late and very late stent thrombosis (ST), and in-stent neoatherosclerosis[2,3]. The Absorb™ bioresorbable vascular scaffold (BVS; Abbott Vascular, Santa Clara, CA, USA), the only US FDA-approved biodegradable scaffold, delivers transient vascular support after revascularisation with properties of drug elution and bioresorption over a period of three to four years[4]. The prospect with the Absorb BVS was the comparable performance with contemporary metallic DES by three years, with no further increase in device-related adverse events thereafter[5].

Previous studies have shown similar one-year clinical outcomes between the Absorb BVS and contemporary metallic DES[6,7]. However, meta-analyses have indicated an increased risk of ST and myocardial infarction (MI) with the Absorb BVS at one year[8,9]. The degradation of the scaffold occurs at one to four years post implantation, and the clinical benefits are anticipated to emerge after one year[10]. It has also been hypothesised that the return of vasomotor function, restoration of physiological wall shear stress distribution, and healing process after Absorb BVS implantation would lead to better long-term clinical outcomes[11].

However, there is still limited evidence regarding the long-term safety of the Absorb BVS and contemporary DES. Since the recently presented AIDA trial demonstrated higher incidence of scaffold thrombosis (ScT) with Absorb BVS compared with metallic DES over two years, a number of meta-analyses have indicated the higher thrombogenicity with Absorb BVS[12]. In our study, we aimed to compare the long-term safety and efficacy of Absorb BVS, contemporary DES and bare metal stents (BMS) by pooling all the available randomised clinical trials with ≥2 years of follow-up. We performed multiple treatment comparison network meta-analysis as well as conventional pairwise frequentist meta-analyses.

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Methods

STUDY DESIGN

This study reports meta-analyses of randomised controlled trials comparing two or more coronary stents or scaffolds in patients undergoing percutaneous coronary intervention which reported long-term clinical outcomes (≥2 years). Eligible study criteria and the electronic search strategy have been published previously[13]. Since the purpose of this study was to compare long-term outcomes, the trials with clinical outcomes <2 years were excluded. In this study, we reported network meta-analysis as well as conventional frequentist meta-analysis. First, hierarchical Bayesian network meta-analysis models were constructed for multiple treatment comparisons incorporating direct and indirect evidence from all eligible trials. Next, conventional frequentist meta-analysis was also carried out to provide better understanding of ST risks according to each time domain. Trials comparing Absorb BVS and cobalt-chromium everolimus-eluting stents (CoCr-EES) were pooled for each time period after index intervention. The study protocol was registered on the PROSPERO database of systematic reviews (number: CRD42017055987). This study was exempt from review by the Seoul National University Bundang Hospital Institutional Review Board.

ELIGIBILITY CRITERIA AND SEARCH STRATEGY

Twelve study stents were compared: (1) BMS; (2) paclitaxel-eluting stents (PES; Boston Scientific, Marlborough, MA, USA); (3) sirolimus-eluting stents (SES; Cordis, Cardinal Health, Milpitas, CA, USA); (4) Endeavor zotarolimus-eluting stents (E-ZES; Medtronic, Minneapolis, MN, USA); (5) CoCr-EES (Abbott Vascular and Boston Scientific); (6) platinum-chromium everolimus-eluting stents (PtCr-EES; Boston Scientific); (7) biodegradable polymer (BP)-EES (Boston Scientific); (8) Resolute™ zotarolimus-eluting stents (R-ZES; Medtronic); (9) BP Biolimus A9-eluting stents (BP-BES; Biosensors, Singapore, and Terumo, Tokyo, Japan); (10) Orsiro hybrid SES (H-SES; Biotronik, Bülach, Switzerland); (11) polymer-free sirolimus- and probucol-eluting stents (dual DES; B. Braun, Melsungen, Germany); and (12) Absorb BVS. Further details concerning study methods are described in the **Supplementary Appendix**.

OUTCOME MEASURES

The principal safety endpoint was the long-term risk of definite or probable ScT or ST defined according to the Academic Research

Consortium (ARC)[14]. Thrombosis rates were classified as early (≤30 days), late (31 days – 1 year), and very late (>1 year) according to the time of onset after the index procedure. The key secondary endpoint was definite ST/ScT defined according to the ARC criteria. Secondary endpoints of network meta-analysis included all-cause death, cardiac death, and MI, target vessel revascularisation (TVR) and target lesion revascularisation (TLR). Secondary endpoints of frequentist conventional meta-analysis were target lesion failure (TLF), cardiac death, target vessel MI, and ischaemia-driven or clinically driven TLR.

DATA SYNTHESIS AND ANALYSIS

Both multiple treatment comparison network meta-analysis and frequentist pairwise meta-analysis were carried out in this study. Data were presented as relative odds ratios (OR) with 95% credible intervals (CrI) for network meta-analysis, OR with 95% confidence intervals (CI) for frequentist meta-analysis. Statistical methods are detailed in the **Supplementary Appendix**.

Results

STUDY SELECTION AND SYSTEMATIC REVIEW

A total of 91 trials including 105,842 patients were identified as having reported long-term clinical outcomes (≥2 years). The flow chart of the network meta-analysis is shown in **Supplementary Figure 1**. The network plot had a polygonal network configuration with mixed connections **(Figure 1)**. While BMS, PES, SES, E-ZES, CoCr-EES, R-ZES, and BP-BES had fully closed loops, the others had limited sample size and comparisons. BP-EES was compared only with PtCr-EES. Seven trials tested the Absorb BVS, six with CoCr-EES, and one with PtCr-EES and BP-BES. There was little evidence of publication bias as shown in the comparison-adjusted funnel plot **(Figure 2)**.

Characteristics of the included trials are summarised in **Supplementary Table 1**. Follow-up duration ranged from two to

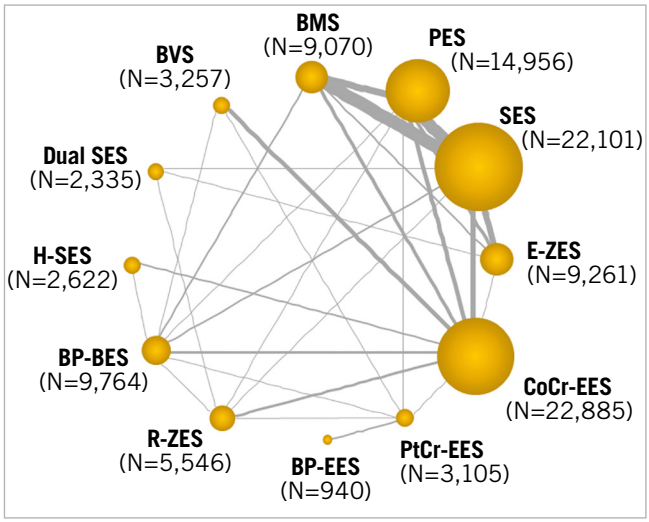

Figure 1. *Network plot of eligible trials. Each stent is represented by a node. The size of the node is proportional to the sample size randomised to each stent, whereas the thickness of the line connecting the nodes is proportional to the total randomised sample size in each pairwise treatment comparison.*

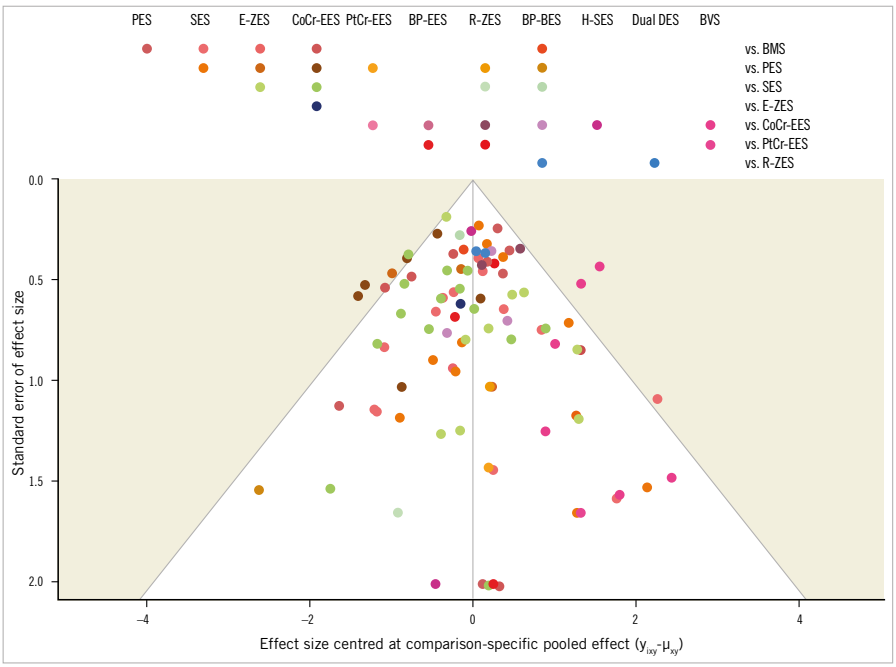

Figure 2. *Comparison-adjusted funnel plot. Each dot represents a single study. The x-axis shows the centred odds ratios, while the y-axis shows the standard error of the effect estimate.*

ten years with a weighted mean of 3.7 years. There were seven trials with a three-arm design and one trial with a four-arm design. Many of the BVS trials had stringent inclusion and exclusion criteria. The ABSORB II (N=501), ABSORB III (N=2,008), ABSORB Japan (N=398), and ABSORB China (N=475) trials enrolled stable or unstable angina patients, and excluded clinically or angiographically high-risk patients. ABSORB-STEMI TROFI II (N=192) exclusively enrolled patients with ST-segment elevation MI, and the EVERBIO II (N=238) and AIDA (N=1,845) trials had an "all-comers" design.

DEVICE THROMBOSIS

A total of 84 trials with a grand total of 99,112 patients contributed to the primary endpoint analysis, definite or probable ST/ScT at two years or longer. The ORs and CrIs for each pair of comparisons derived from the Bayesian random effects model are shown in **Table 1**. The Absorb BVS had a significantly higher risk of long-term ScT compared to R-ZES, E-ZES, BP-BES, dual DES, CoCr-EES, H-SES, and BP-EES. In addition, ST risk for PES, BMS, and SES was significantly higher than for R-ZES (borderline significance compared with SES), E-ZES, BP-BES, CoCr-EES, and H-SES. Forest plots visually indicate the relative risks of BVS, PES, BMS, and SES compared to other devices **(Figure 3)**. The probability of the rank of each device was (BP-EES ≥ H-SES ≥ CoCr-EES ≥ dual DES ≥ PtCr-EES ≥ BP-BES ≥ E-ZES≥ R-ZES) > (SES ≥ BMS ≥ PES) > BVS, as shown in **Figure 4**. Network meta-regression analyses showed none of the study baseline characteristics significantly altering the relative treatment effects between the study stents **(Supplementary Table 2)**. The risk of very late ScT (>1-year) of BVS was significantly higher than any other comparators except PtCr-EES and BP-EES **(Supplementary Table 3)**. BMS showed a lower very late ST risk than SES and PES as well as BVS.

Pairwise meta-analysis was carried out pooling trials directly comparing BVS and CoCr-EES **(Figure 5)**. Six trials with 5,418 patients contributed to the analysis. The pooled risk of long-term ScT of BVS was significantly higher than that of CoCr-EES. When ScT rates were split into early, late, and very late, the risk of very late ScT was significantly higher at all time points. There was a numerical trend towards a higher risk estimate with a more delayed time frame.

Network meta-analysis for definite ST showed results similar to definite or probable ST **(Supplementary Table 4)**. The probable rank of each device was as follows: (CoCr-EES ≥ H-SES ≥ E-ZES ≥ BP-EES ≥ PtCr-EES ≥ BP-BES ≥ R-ZES ≥ dual DES) > (BMS ≥ SES ≥ PES ≥ BVS). In terms of very late definite ScT, BVS showed a significantly higher risk than most of the DES **(Supplementary Table 5)**. Frequentist meta-analysis for definite ScT/ST also showed that the pooled risk of long-term definite ScT was significantly higher with BVS than with CoCr-EES **(Supplementary Figure 2)**.

Table 1. Pairwise comparisons of definite or probable stent thrombosis between study stents

	BVS	PES	BMS	SES	R-ZES	E-ZES	BP-BES	PtCr-EES	Dual DES	CoCr-EES	H-SES	BP-EES
vs. BVS	–	0.54 (0.28-0.99)	0.50 (0.25-0.91)	0.47 (0.24-0.88)	0.31 (0.15-0.59)	0.30 (0.14-0.57)	0.29 (0.14-0.55)	0.27 (0.12-0.69)	0.27 (0.11-0.68)	0.24 (0.13-0.43)	0.19 (0.09-0.40)	0.18 (0.04-0.89)
vs. PES	1.85 (1.01-3.55)	–	0.93 (0.76-1.15)	0.88 (0.73-1.06)	0.57 (0.37-0.90)	0.56 (0.41-0.76)	0.54 (0.37-0.79)	0.51 (0.25-1.08)	0.51 (0.24-1.03)	0.46 (0.36-0.57)	0.35 (0.21-0.61)	0.34 (0.07-1.51)
vs. BMS	2.00 (1.10-3.99)	1.08 (0.87-1.32)	–	0.94 (0.75-1.17)	0.61 (0.39-0.97)	0.60 (0.43-0.83)	0.58 (0.40-0.86)	0.55 (0.26-1.18)	0.55 (0.26-1.13)	0.49 (0.38-0.63)	0.38 (0.22-0.66)	0.37 (0.08-1.64)
vs. SES	2.14 (1.14-4.09)	1.14 (0.95-1.37)	1.07 (0.86-1.33)	–	0.65 (0.43-1.05)	0.64 (0.48-0.85)	0.61 (0.45-0.89)	0.59 (0.28-1.23)	0.58 (0.28-1.19)	0.52 (0.41-0.66)	0.40 (0.24-0.71)	0.39 (0.09-1.79)
vs. R-ZES	3.26 (1.68-6.60)	1.77 (1.11-2.68)	1.64 (1.03-2.58)	1.55 (0.95-2.32)	–	0.97 (0.58-1.62)	0.94 (0.61-1.46)	0.89 (0.47-1.72)	0.89 (0.48-1.67)	0.80 (0.53-1.19)	0.62 (0.33-1.18)	0.60 (0.13-2.55)
vs. E-ZES	3.33 (1.75-7.13)	1.80 (1.31-2.47)	1.68 (1.21-2.35)	1.57 (1.18-2.08)	1.03 (0.62-1.74)	–	0.96 (0.63-1.53)	0.93 (0.42-2.00)	0.91 (0.41-1.94)	0.82 (0.57-1.17)	0.63 (0.35-1.16)	0.62 (0.13-2.87)
vs. BP-BES	3.47 (1.81-7.24)	1.86 (1.26-2.69)	1.73 (1.17-2.48)	1.64 (1.12-2.25)	1.06 (0.69-1.64)	1.04 (0.65-1.58)	–	0.96 (0.44-1.99)	0.95 (0.43-1.95)	0.85 (0.58-1.20)	0.65 (0.36-1.23)	0.63 (0.15-2.77)
vs. PtCr-EES	3.72 (1.46-8.38)	1.97 (0.93-4.04)	1.82 (0.85-3.80)	1.70 (0.81-3.60)	1.12 (0.58-2.15)	1.08 (0.50-2.40)	1.04 (0.50-2.26)	–	1.00 (0.40-2.48)	0.89 (0.43-1.85)	0.69 (0.29-1.60)	0.65 (0.18-2.50)
vs. Dual DES	3.75 (1.48-9.23)	1.97 (0.97-4.13)	1.83 (0.88-3.91)	1.72 (0.84-3.61)	1.12 (0.60-2.08)	1.10 (0.51-2.44)	1.05 (0.51-2.31)	1.00 (0.40-2.51)	–	0.89 (0.45-1.88)	0.69 (0.29-1.72)	0.69 (0.13-3.25)
vs. CoCr-EES	4.11 (2.32-7.44)	2.19 (1.76-2.77)	2.04 (1.58-2.66)	1.92 (1.51-2.42)	1.25 (0.84-1.89)	1.22 (0.85-1.75)	1.18 (0.83-1.72)	1.13 (0.54-2.33)	1.12 (0.53-2.23)	–	0.77 (0.48-1.31)	0.76 (0.17-3.29)
vs. H-SES	5.30 (2.49-11.2)	2.85 (1.63-4.81)	2.65 (1.51-4.52)	2.49 (1.41-4.20)	1.62 (0.85-2.99)	1.58 (0.86-2.83)	1.53 (0.82-2.77)	1.45 (0.63-3.41)	1.45 (0.58-3.40)	1.29 (0.76-2.09)	–	0.96 (0.20-4.65)
vs. BP-EES	5.63 (1.13-25.6)	2.94 (0.66-13.4)	2.73 (0.61-12.3)	2.55 (0.56-11.4)	1.67 (0.39-7.48)	1.62 (0.35-7.45)	1.59 (0.36-6.89)	1.53 (0.40-5.48)	1.44 (0.31-7.69)	1.32 (0.30-5.94)	1.04 (0.22-5.09)	–

Odds ratios and 95% credible intervals are presented. Comparisons with significantly lower risk were highlighted with red, and those with higher risk were with blue. BMS: bare metal stents; BP-BES: biodegradable polymer biolimus-eluting stents; BP-EES: biodegradable polymer everolimus-eluting stents; BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents; Dual DES: sirolimus- and probucol-eluting stents; E-ZES: Endeavor zotarolimus-eluting stents;,H-SES: Orsiro hybrid sirolimus-eluting stents; PES: paclitaxel-eluting stents; PtCr-EES: platinum-chromium everolimus-eluting stents; R-ZES: Resolute zotarolimus-eluting stents; SES: sirolimus-eluting stents

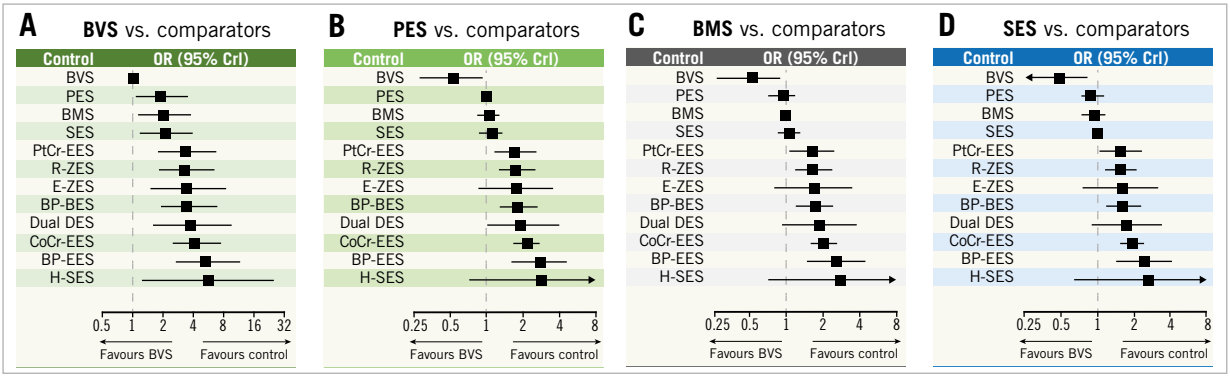

Figure 3. *Network meta-analysis for long-term definite or probable stent thrombosis. A) BVS vs. comparators. B) PES vs. comparators. C) BMS vs. comparators. D) SES vs. comparators. The squares and horizontal lines indicate pairwise odds ratios (OR) and their 95% credible intervals (CrI) for definite or probable stent thrombosis.*

Secondary endpoints

Network meta-analyses for all-cause death, cardiac death, MI, TVR, and TLR are shown in the electronic supplement **(Supplementary Table 6-Supplementary Table 10)**. Network meta-analysis showed that BVS was associated with an increased risk of MI compared to SES, BP-BES, CoCr-EES, R-ZES, E-ZES, dual DES, PtCr-EES, and H-SES **(Supplementary Table 8)**. BVS showed similar performance as compared with other DES, and significantly better than BMS in terms of TVR and TLR **(Supplementary Table 9, Supplementary Table 10)**.

Conventional frequentist meta-analyses were carried out for TLF and its components. TLF did not differ at one year, but was significantly higher with BVS than CoCr-EES when the follow-up was extended to the long term **(Supplementary Figure 3)**. The risk of cardiac death was similar both at one year and at the extended follow-up **(Supplementary Figure 4)**. The increase in TLF was driven by both target vessel MI and ischaemia-driven TLR. The pooled risk of target vessel MI was significantly higher with BVS at any time period **(Supplementary Figure 5)**. While TLR did not differ significantly at one year, it diverged

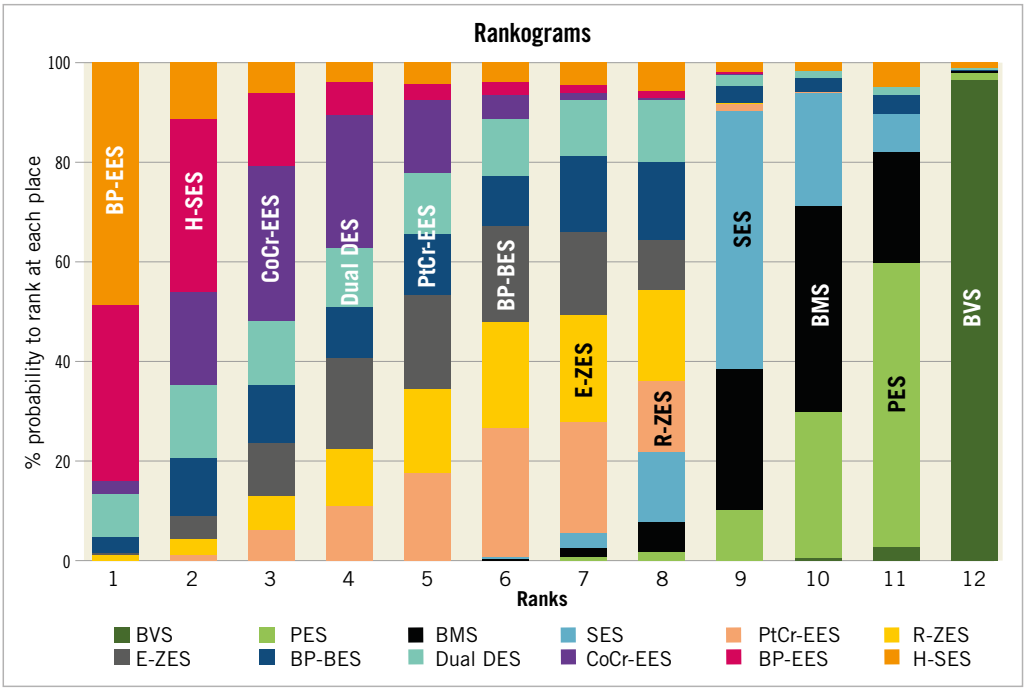

Figure 4. *Ranks for study devices regarding definite or probable stent thrombosis. Bar plots for the ranking probabilities of competing stents. The possible rank of each treatment (from best to worst according to the outcome) is on the horizontal axis. The size of each bar corresponds to the probability of each treatment to be at a specific rank.*

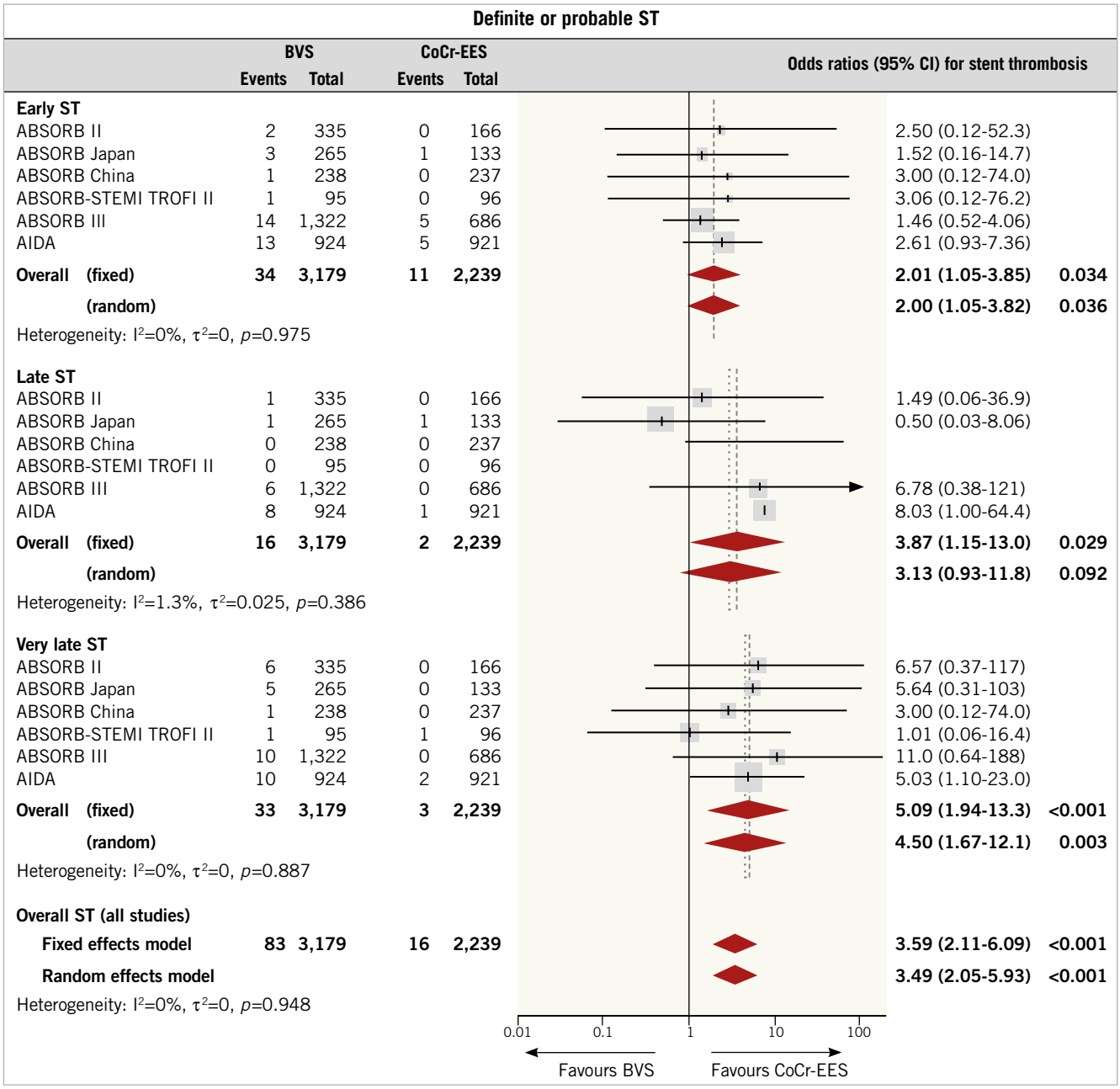

Figure 5. *Frequentist meta-analysis for definite or probable stent thrombosis (ST) comparing bioresorbable vascular scaffolds (BVS) and cobalt-chromium everolimus-eluting stents (CoCr-EES). Forest plot with odds ratios (OR) for long-term definite or probable ST with BVS compared to CoCr-EES for individual trials and the pooled population. The squares and the horizontal lines indicate the ORs and the 95% confidence intervals (CI) for each included trial. The size of each square is proportional to the statistical weight of a trial in the meta-analysis.*

and showed a statistically significant difference when the follow-up was extended **(Supplementary Figure 6)**.

Discussion

Our study is among the first network meta-analyses to report long-term clinical outcomes following deployment of biodegradable scaffolds[15]. Our observations indicate that the risk of device thrombosis after Absorb BVS deployment continues to rise beyond one year. BVS deployment was associated with a higher risk of late or very late ScT compared to contemporary second-generation DES. In addition, the Absorb BVS showed elevated risks of TLF, MI and ischaemia-driven TLR.

Based on our prior observations, with this new evidence we deliver novel insights related to the long-term safety and efficacy following biodegradable scaffold deployment: the rising OR for Absorb BVS vs. CoCr-EES from 2.28 (95% CrI: 1.07-6.29) at one year, to 3.86 (95% CrI: 2.38-6.98) after a mean follow-up of 3.7 years[13]. The increment originated from a continuous increase

of ScT risk beyond one year. Stent design iterations and material properties optimisation adopted in current-generation DES have minimised the risk of very late ST to 0.5%/year or lower especially with second-generation DES[13,16]. The concept of vascular restoration with the Absorb BVS was anticipated to lead to long-term safety after complete biodegradation of the scaffold. However, recent evidence indicates the dramatically increased risk of very late ScT with Absorb BVS even at two to three years[17,18].

Cumulative evidence suggests that the higher thrombogenicity observed with biodegradable scaffolds occurs due to suboptimal deployment techniques in combination with the bulky scaffold's strut design. The larger strut thickness of Absorb BVS in the range of 157 µg provides a larger platform profile in both the crimped and the expanded stage that induces local haemodynamic alterations prone to platelet activation[19]. An optical coherence tomography study with simulation modelling showed low endothelial shear stress zones created between the strut surfaces of the Absorb BVS[20], which may predispose to acute thrombogenicity[21]. An animal *ex vivo* model also demonstrated increased acute thrombogenicity of the Absorb BVS[22].

The physical property of the polymer-based Absorb BVS which enables greater acute recoil and strut fracture compared to contemporary metallic stents needs to be considered as well. Prior studies have indicated that incomplete lesion coverage, underexpansion, and strut malapposition contribute to Absorb BVS thrombosis, similar to metallic stent thrombosis[23]. More recently, it was suggested that late strut discontinuity may cause vulnerability to scaffold thrombotic events[24]. In this context, the critical role of judicious patient and lesion selection is imperative. Also, a specific implantation technique for Absorb BVS deployment is strongly encouraged.

Another potential explanation for late or very late ST risks is vascular inflammation. In a study by Virmani et al using a porcine coronary model, mild to moderate inflammatory responses were observed with the Absorb BVS[25]. While inflammation was absent with CoCr-EES, low-grade inflammation persisted throughout 42 months. Polymer-induced inflammation has previously been associated with ST events, especially late and very late ST[26]. However, it needs to be mentioned that poly-L lactide and poly-D, L lactide, which are the main materials used in the current Absorb BVS, have also been used in biodegradable polymer metallic DES as well as in other medical devices. What is the most prevailing factor associated with inflammation and whether low-grade inflammation is associated with late thrombogenicity needs to be assessed in further studies.

Evidence following observations from the ABSORB II and III randomised clinical trials strongly encourages a judicious patient and lesion selection and optimisation. Puricel et al also demonstrated a significant reduction in the incidence of scaffold thrombosis after employing a BVS-specific implantation strategy[27]. Stone et al pooled the results of the prospective ABSORB II, III, China, Japan, and EXTEND trials, also showing the importance of vessel sizing and operator technique[28]. The choice and duration of dual antiplatelet therapy (DAPT) is currently debated. While the current guidelines recommend DAPT for at least six to 12 months after implantation of contemporary DES, it is still unclear how long DAPT should be maintained for the patients who were treated with biodegradable scaffolds[29].

Although the manufacturer halted commercial production of the first-generation Absorb BVS, a second-generation BVS with a thinner strut profile of 99 µm and expansion limit of >0.75 mm over nominal diameter has been tested experimentally and will undergo first-in-man studies soon. Other manufacturers are also developing polymer-based scaffolds with thinner strut profiles such as (1) DESolve novolimus-eluting scaffold (Elixir Medical Corporation, Sunnyvale, CA, USA) with a strut thickness of 120 µm, (2) MeRes100™ sirolimus-eluting hybrid cell design scaffold with a strut thickness of 100 µm (Meril Life Sciences, Vapi, India), and (3) Fantom® scaffold with a strut thickness of 125 µm (REVA Medical, San Diego, CA, USA). Obviously, these new-generation scaffolds will need to be tested against the best metallic stents to get to the point where evaluation of the long-term promise of biodegradable scaffolds can be made[30].

There were additional important findings in this study. First, newer-generation DES showed an excellent long-term safety profile. Most contemporary DES had a lower risk of long-term ST than BMS and first-generation DES. Second, BMS were superior to first-generation DES in terms of very late ST. In our previous work, BMS were shown to be associated with the highest risk of early ST[9]. However, this study showed that BMS had safer profiles in terms of late and very late ST, comparable to those for CoCr-EES. The finding is consistent with the old belief that a bare metal surface is superior in terms of long-term safety. Third, there were no significant differences between biodegradable polymer and durable polymer metallic DES. In our previous network meta-analysis, BP-BES were shown to have significantly higher risk of ST at one year than CoCr-EES and H-SES[31]. However, this study showed that the longer-term ST risk of BP-BES may be considered comparable to them.

Limitations

This study has several limitations. First, the sample sizes of new devices including Absorb BVS were small, and follow-up duration was limited. Ongoing studies with larger sample size and longer-term follow-up may further elucidate the safety, efficacy and overall performance of the Absorb BVS. Secondly, the connection of the BVS arm in the evidence network was only partial. Most of the evidence came from the direct comparison between the Absorb BVS and CoCr-EES, while indirect evidence was weak. Third, the trials analysed in this study had a variety of patient characteristics, follow-up, and medication protocols.

Conclusions

The Absorb BVS was associated with an increased risk of very late ScT compared to current-generation metallic DES after a mean

follow-up of 3.7 years. While previous studies have shown the Absorb BVS to be associated with an increased risk of late ScT compared to contemporary DES, this study suggests that the risk is not attenuated and rather continues to widen beyond one year.

Impact on daily practice

Device thrombosis risk after Absorb BVS implantation continues to increase beyond one year. The Absorb BVS is associated with an increased risk of long-term and very late device thrombosis as well as target lesion failure compared to current-generation metallic DES. It is anticipated that newer iterations of BVS will overcome the current issue of scaffold thrombosis.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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References 32 to 279 can be found in the online version of this paper.

Supplementary data

Supplementary Appendix. Study methods.

Supplementary Table 1. Study characteristics of included trials.

Supplementary Table 2. Results from network meta-regression adjusted for covariates in terms of long-term definite or probable stent thrombosis.

Supplementary Table 3. Pairwise comparisons of very late definite or probable stent thrombosis between study stents.

Supplementary Table 4. Pairwise comparisons of long-term definite stent thrombosis between study stents.

Supplementary Table 5. Pairwise comparisons of very late definite stent thrombosis between study stents.

Supplementary Table 6. Pairwise comparisons of all-cause death between study stents.

Supplementary Table 7. Pairwise comparisons of cardiac death between study stents.

Supplementary Table 8. Pairwise comparisons of myocardial infarction between study stents.

Supplementary Table 9. Pairwise comparisons of target vessel revascularisation between study stents.

Supplementary Table 10. Pairwise comparisons of target lesion revascularisation between study stents.

Supplementary Figure 1. PRISMA flow diagram of systematic review.

Supplementary Figure 2. Frequentist meta-analysis for definite stent thrombosis (ST).

Supplementary Figure 3. Frequentist meta-analysis for target lesion failure (TLF).

Supplementary Figure 4. Frequentist meta-analysis for cardiac death.

Supplementary Figure 5. Frequentist meta-analysis for target vessel myocardial infarction (TV-MI).

Supplementary Figure 6. Frequentist meta-analysis for ischaemia-driven or clinically driven target lesion revascularisation (TLR).

The supplementary data are published online at: http://www.pcronline.com/eurointervention/131st_issue/311

Supplementary data

Supplementary Appendix. Study methods.

Eligibility criteria

Exclusion criteria were comparison of stents within the same category, no specification of stent types in study protocol, and publications in a language other than English. No restrictions were imposed on study period, sample size, publication status, or patient or lesion criteria.

Search strategy

An electronic search was carried out for publications of each trial that reported long-term clinical outcomes. PubMed, Embase, Cochrane Central Register of Controlled Trials, and relevant websites (www.crtonline.org, www.clinicaltrialresults.com, www.tctmd.com, www.cardiosource.com, and www.pcronline.com) were searched from the inception of each database to October 2017. A manual review of reference lists of included articles complemented the search. References of recent reviews, editorials, and meta-analyses were also examined.

Data extraction

Two individual investigators (Si-Hyuck Kang and Ki-Hyun Jeon) independently performed screening of titles and abstracts, identified duplicates, reviewed full articles, and determined their eligibility. Any disagreements were resolved through discussion between reviewers. The most updated data for each study were searched manually and chosen for abstraction. One reviewer (Si-Hyuck Kang) performed data extraction, which was subsequently crosschecked by a second reviewer (Jie-Suck Park).

Data synthesis and analysis

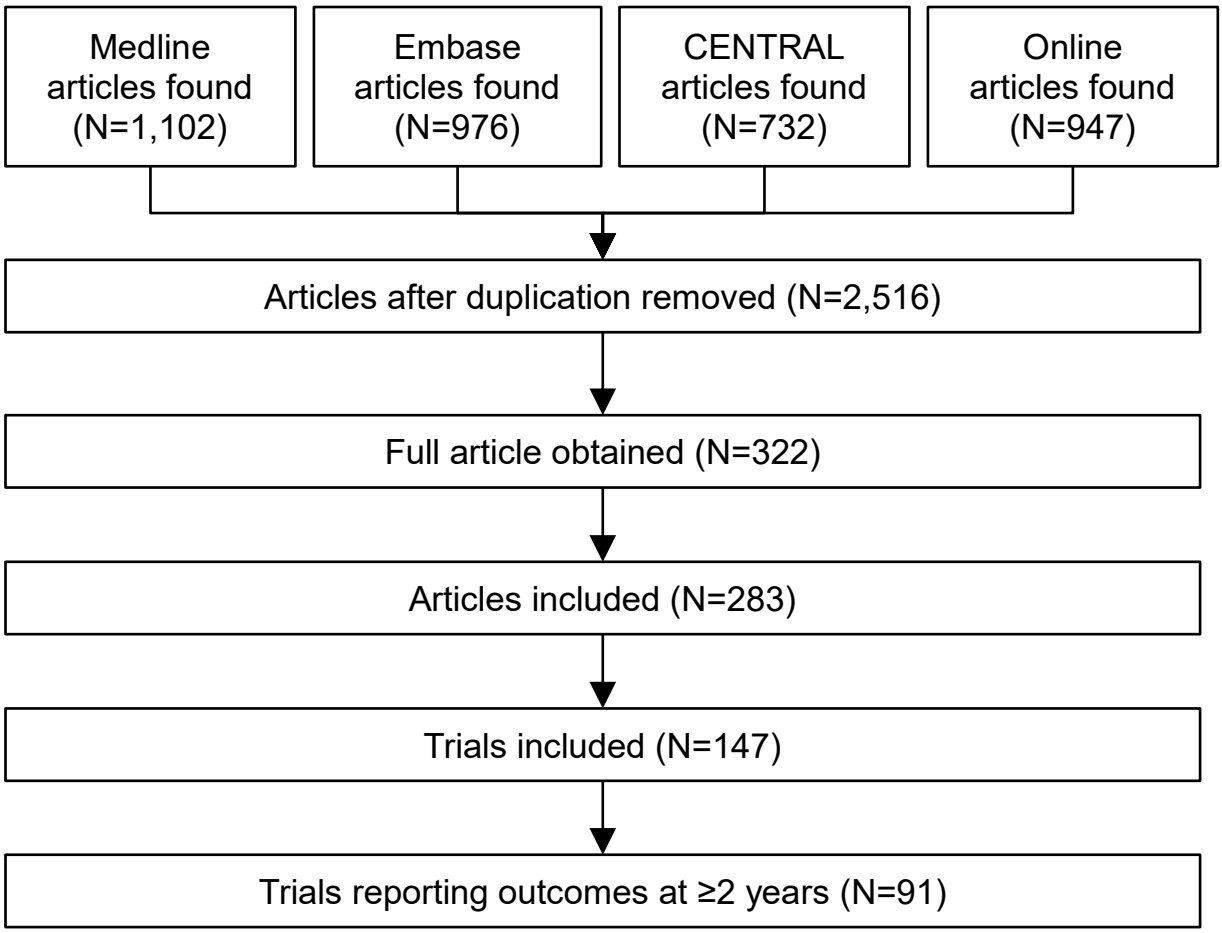
A network meta-analysis has advantages that enable a global estimate of comparative treatment effectiveness combining both direct and indirect evidence from multiple trials. A multiple treatment comparison network meta-analysis model was built up using Bayesian extension of the hierarchical random effects model proposed by Lumley. We used Markov

chain Monte Carlo samplers in WinBUGS version 1.4.3 (MRC Biostatistics Unit, Cambridge, United Kingdom) running three chains with different starting values. Comparative odds ratios (OR) with 95% credible intervals (CrI) were estimated from the posterior distribution. The ranking of each device was evaluated using the posterior probability. The goodness-of-fit of the models was measured based on the residual deviance and the deviance information criterion. Consistency between direct and indirect sources of evidence was assessed locally.

The models were extended to adjust for potential effect modifiers. Fixed effects network meta-regression was performed adjusting for covariates such as (1) mean age, (2) proportion of male sex, and (3) proportion of diabetes as a continuous variable, and (4) recommended duration of dual antiplatelet therapy as a dichotomous one. Duration of dual antiplatelet therapy was classified into short (<12 months) and long (≥12 months) according to the minimal duration recommended by each study protocol.

For pairwise meta-analysis for direct comparison, pooled ORs were calculated with the use of the Mantel-Haenszel fixed effects model as well as the DerSimonian and Laird random effects model. OR with 95% confidence intervals (CI) were presented as summary statistics. Statistical heterogeneity was assessed with Cochran's Q test and was quantified with the I^2 test. Statistical analyses were performed with the use of R Open 3.1.1 and the metaphor package (R Foundation for Statistical Computing, Vienna, Austria).

Supplementary Figure 1. PRISMA flow diagram of systematic review.



Supplementary Table 1. Study characteristics of included trials.

Trials	Maximal F/U	Stent comparison	Sample size	Mean age	Male (%)	Diabetes (%)		Major inclusion criteria
Published in 2002								
1. RAVEL[32-34]	5 years	SES vs. BMS	120:118	61	76	19	DAPT ≥8 weeks	Stable or unstable angina
Published in 2003								
2. E-SIRIUS[35, 36]	4 years	SES vs. BMS	175:177	62	71	23	DAPT ≥2 months	Stable or unstable angina
3. SIRIUS[37-40]	5 years	SES vs. BMS	533:525	62	71	26	DAPT ≥3 months	Stable or unstable angina
4. TAXUS I[41-43]	2 years	PES vs. BMS	31:30	65	89	18	DAPT ≥6 months	Stable or unstable angina
5. TAXUS II[43-45]	5 years	BMS vs. PES	270:266	60	79	16	DAPT ≥6 months	Stable or unstable angina
Published in 2004								
6. SES-SMART[46, 47]	2 years	SES vs. BMS	129:128	64	72	25	DAPT ≥2 months	Stable angina, ACS
7. TAXUS IV[43, 48, 49]	5 years	BMS vs. PES	652:662	62	72	24	DAPT ≥6 months	Stable or unstable angina
Published in 2005								
8. BASKET[50-53]	3 years	SES vs. PES	264:281	64	79	19	DAPT ≥6 months	All-comer design
9 DIABETES[54-58]	5 years	SES vs. BMS	80:80	67	63	100	DAPT ≥12 months	Diabetes
10. ISAR-DESIRE[59, 60]	5 years	SES vs. PES	100:100	64	79	29	DAPT ≥6 months	ISR
11. ISAR-DIABETES[60, 61]	5 years	PES vs. SES	125:125	68	73	100	DAPT ≥6 months	Diabetes
12. SIRTAX[62-65]	10 years	SES vs. PES	503:509	62	77	20	DAPT ≥12 months	Stable angina or ACS
13. SPIRIT FIRST[66-69]	5 years	CoCr-EES vs. BMS	28:32	63	73	11	DAPT ≥3 months	Stable or unstable angina
14. STRATEGY[70-73]	5 years	BMS vs. SES	88:87	62	67	15	DAPT ≥3 months	STEMI
15. TAXUS VI[74-78]	5 years	PES vs. BMS	219:227	63	76	22	DAPT ≥6 months	Stable or unstable angina
Published in 2006								
16. ENDEAVOR II[79-83]	5 years	E-ZES vs. BMS	598:599	62	76	20	DAPT ≥12 weeks	Stable or unstable angina
17. ENDEAVOR III[84-86]	5 years	E-ZES vs. SES	323:113	61	69	29	DAPT ≥6 months	Stable or unstable angina

18. ISAR-SMART 3[60, 87]	5 years	PES vs. SES	180:180	67	72	0	DAPT ≥6 months	Stable or unstable angina
19. Pasceri et al[88] (from other works[89, 90])	3 years	SES vs. BMS	32:33	62	74	23	Insufficient information	STEMI
20. PASSION[91-93]	5 years	PES vs. BMS	310:309	61	74	31	DAPT ≥6 months	STEMI
21. PRISON II[94-98]	5 years	BMS vs. SES	100:100	59	80	14	DAPT ≥6 months	Chronic total occlusion
22. REALITY[99, 100]	2 years	SES vs. PES	684:669	62	73	28	DAPT ≥6 months for PES, ≥2 months for SES	Stable or unstable angina
23. RRISC[101, 102]	3 years	BMS vs. SES	37:38	73	89	14	DAPT ≥2 months	Saphenous vein grafts
24. SCANDSTENT[103]	3 years	SES vs. BMS	163:159	63	77	18	DAPT ≥12 months	Stable or unstable angina, recent NSTEMI
25. TYPHOON[104, 105]	4 years	SES vs. BMS	355:357	59	78	16	DAPT ≥6 months	STEMI
Published in 2007								
26. Erglis et al[106, 107]	3 years	BMS vs. PES	50:53	62	83	12	DAPT ≥6 months	Unprotected LMCA
27. NOBORI 1 - Phase 1[108, 109]	2 years	BP-BES vs. PES	85:35	64	68	20	DAPT ≥6 months	Stable or unstable angina
28. SCORPIUS[110, 111]	5 years	SES vs. BMS	98:102	66	64	100	DAPT ≥6 months	Diabetes
29. SESAMI[112-115]	5 years	SES vs. BMS	160:160	63	80	20	DAPT ≥12 months	STEMI
Published in 2008								
30. DES-DIABETES[116-118]	4 years	SES vs. PES	200:200	61	58	100	DAPT ≥6 months; randomly allocated in a 1:1 ratio to TAT and DAPT	Diabetes
31. Hong et al[119, 120]	3 years	SES vs. PES	85:84	62	74	100	DAPT ≥6 months	Diabetes
32. LEADERS[121-127]	5 years	BP-BES vs. SES	857:850	64	75	24	DAPT ≥12 months	Stable angina, ACS
33. MISSION![128-130]	5 years	SES vs. BMS	158:152	59	78	10	DAPT ≥12 months	STEMI
34. MULTI-STRATEGY[131-134]	3 years	BMS vs. SES	372:372	64	76	14	DAPT ≥3 months	STEMI
35. PROSIT[135, 136]	3 years	SES vs. PES	154:154	60	76	25	DAPT ≥6 months	STEMI

36. SORT OUT II[137, 138]	5 years	SES vs. PES	1,065:1,033	64	75	15	DAPT ≥12 months	All-comer design
37. SPIRIT III[139-143]	5 years	CoCr-EES vs. PES	669:333	63	70	28	DAPT ≥6 months	Stable or unstable angina
Published in 2009								
38. HORIZONS-AMI[144-146]	3 years	PES vs. BMS	2257:749	60	77	16	DAPT ≥6 months	STEMI
39. ISAR-LEFT-MAIN[147]	2 years	PES vs. SES	302:305	69	78	29	DAPT indefinitely	Unprotected LMCA
40. ISAR-TEST-2[148, 149]	2 years	SES vs. dual DES vs. E-ZES	335:333:339	67	23	27	DAPT ≥6 months	de novo stenosis
41. ISAR-TEST-4[150-152]	5 years	CoCr-EES vs. SES	652:652	67	76	29	DAPT ≥6 months	Stable angina, ACS
42. PASEO[153, 154]	4 years	BMS vs. PES vs. SES	90:90:90	62	71	26	DAPT ≥6 months	STEMI
43. SOS[155, 156]	5 years	BMS vs. PES	39:41	67	100	44	DAPT ≥6 months for PES, ≥1 month for BMS	Saphenous vein graft lesions
44. SPIRIT II[139, 157-160]	5 years	CoCr-EES vs. PES	223:77	62	73	23	DAPT ≥6 months	Stable or unstable angina
Published in 2010								
45. BASKET-PROVE[161, 162]	2 years	SES vs. CoCr-EES vs. BMS	775:774:765	66	76	16	DAPT ≥12 months	Large coronary artery (stents ≥3.0 mm)
46. COMPARE[163-165]	5 years	CoCr-EES vs. PES	897:903	63	69	17	DAPT ≥12 months	All-comer design
47. ENDEAVOR IV[166-169]	5 years	E-ZES vs. PES	773:775	64	68	31	DAPT ≥6 months	Stable or unstable angina
48. GISSOC II-GISE[170]	2 years	BMS vs. SES	78:74	64	83	22	DAPT ≥6 months	Chronic total occlusion
49. RESOLUTE All Comers[171-174]	4 years	R-ZES vs. CoCr-EES	1,140:1,152	64	77	23	DAPT ≥6 months	All-comer design
50. SORT OUT III[175-177]	5 years	E-ZES vs. SES	1,162:1,170	64	73	13	DAPT ≥1 year	All-comer design
51. SPIRIT IV[178-181]	3 years	CoCr-EES vs. PES	2,458:1,229	63	68	32	DAPT ≥6 months	Stable or unstable angina
52. ZEST[182, 183]	2 years	E-ZES vs. SES vs. PES	883:878:884	62	66	29	DAPT ≥12 months	Stable angina or ACS
Published in 2011								
53. EXCELLENT[184-186]	3 years	CoCr-EES vs. SES	1,079:364	63	65	38	Randomised to 6- vs. 12-month DAPT (1:1)	Stable or unstable angina, recent MI

54. KOMER[187]	2 years	E-ZES vs. SES vs. PES	205:204:202	60	79	21	DAPT ≥12 months	STEMI
55. ISAR-TEST 5[188, 189]	5 years	Dual DES vs. R-ZES	2,002:1,000	68	76	29	not specified	All-comer design
56. Naples-Diabetes[190]	3 years	SES vs. PES vs. E-ZES	76:75:75	64	57	100	DAPT ≥6 months	Diabetes
57. PLATINUM[191, 192]	3 years	CoCr-EES vs. PtCr-EES	762:768	64	71	24	DAPT ≥6 months	Stable or unstable angina
58. POET[193]	5 years	SES vs. PES	152:149	62	36	30	DAPT ≥6 months for PES, ≥3 months for SES	de novo lesion
59. PRISON III[194-196]	3 years	SES vs. E-ZES SES vs. R-ZES	51:46 103:104	62	84	23	DAPT ≥12 months	Chronic total occlusion
Published in 2012								
60. COMFORTABLE AMI[197-199]	2 years	BP-BES vs. BMS	575:582	61	79	15	DAPT ≥1 year	AMI
61. DEBATER[200, 201]	5 years	SES vs. PES	424:446	60	76	10	DAPT ≥6-12 months for SES, ≥1 month for BMS	STEMI
62. EVOLVE[202-204]	5 years	PtCr-EES vs. BP-EES	98:94	63	73	19	DAPT ≥6~12 months	Stable or unstable angina
63. EXAMINATION[205-208]	5 years	CoCr-EES vs. BMS	751:747	61	84	18	DAPT ≥12 months	STEMI
64.PROTECT[209-212]	5 years	E-ZES vs. SES	4,357:4,352	62	76	28	DAPT 3-12 months	All-comer design
65. RESET[213, 214]	3 years	CoCr-EES vs. SES	1,597:1,600	69	77	45	DAPT ≥3 months	All-comer design
66. SORT OUT IV[215-219]	5 years	CoCr-EES vs. SES	1,390:1,384	64	76	14	DAPT ≥12 months	All-comer design
67. TWENTE[220-225]	5 years	R-ZES vs. CoCr-EES	697:694	64	72	22	DAPT ≥12 months	Stable or unstable angina, NSTEMI
68. X-AMI[226, 227]	3 years	CoCr-EES vs. SES	404:221	61	74	10	DAPT ≥12 months	AMI
Published in 2013								
69. APPENDIX-AMI[228]	2 years	CoCr-EES vs. SES	498:479	65	72	12	DAPT ≥12 months	All-comer design
70. COMPARE II[229-231]	5 years	BP-BES vs. CoCr-EES	1,795:912	63	74	22	DAPT ≥12 months	All-comer design
71. NEXT[232-234]	3 years	BP-BES vs. CoCr-EES	1,617:1,618	69	77	46	Operator's discretion	All-comer design

72. PROMISE[235]	2 years	PES vs. PtCr-EES	410:416	64	62	32	unclear	All-comer design
73. RESOLUTE China[236, 237]	2 years	R-ZES vs. PES	198:202	60	79	28	DAPT ≥6 months	All-comer design
74. SORT OUT V[238, 239]	3 years	BP-BES vs. SES	1,229:1,239	65	75	15	DAPT ≥12 months	All-comer design
Published in 2014								
75. BIOSCIENCE[240, 241]	2 years	O-SES vs. CoCr-EES	1,063:1,056	66	77	23	DAPT ≥6 months	All-comer design
76. DUTCH PEERS[242, 243]	3 years	R-ZES vs. PtCr-EES	905:905	64	73	18	DAPT ≥12 months	All-comer design
77. PRODIGY[244, 245]	2 years	BMS vs. E-ZES vs. PES vs. CoCr-EES	502:500: 500:501	68	76	25	DAPT ≥6 months	All-comer design
78. RACES-MI[246, 247]	Mean 5.8 years	SES vs. CoCr-EES	250:250	59	65	26	DAPT ≥12 months	STEMI
Published in 2015								
79. ABSORB II[248-251]	4 years	BVS vs. CoCr-EES	335:166	61	77	24	not specified	Stable or unstable angina
80. ABSORB III[252-255]	3 years	BVS vs. CoCr-EES	1,322:686	64	70	32	DAPT ≥12 months	Stable or unstable angina
81. ABSORB China[256-258]	3 years	BVS vs. CoCr-EES	238:237	57	72	25	DAPT ≥12 months	Stable or unstable angina
82. ABSORB Japan[259-261]	3 years	BVS vs. CoCr-EES	265:133	67	77	36	DAPT ≥12 months	Stable or unstable angina
83. ABSORB-STEMI TROFI II[262, 263]	2 years	BVS vs. CoCr-EES	95:96	59	80	17	DAPT ≥12 months	STEMI
84. BASKET-PROVE II[264]	2 years	BP-BES vs. CoCr-EES vs. BMS	765:765:761	62	78	19	DAPT ≥12 months	Large coronary artery (stents ≥3.0 mm)
85. BIOFLOW II[265, 266]	4 years	O-SES vs. CoCr-EES	298:154	63	77	28	DAPT ≥6 months	Stable or unstable angina
86. EVERBIO II[267-269]	2 years	PtCr-EES vs. BP-BES vs. BVS	80:80:78	65	79	24	DAPT ≥6 months	All-comer design
87. EVOLVE II[203, 270, 271]	3 years	BP-EES vs. PtCr-EES	846:838	64	72	31	DAPT ≥6 months	Stable or unstable angina, NSTEMI
88. SORT OUT VI[272, 273]	3 years	R-ZES vs. BP-BES	1,502:1,497	66	76	18	DAPT ≥12 months	All-comer design
89. SORT OUT VII[274-276]	2 years	O-SES vs. BP-BES	1,261:1,264	66	75	19	DAPT ≥12 months	All-comer design
90. TUXEDO–India[277, 278]	2 years	PES vs. CoCr-EES	914:916	58	75	100	DAPT ≥12 months	Diabetes
Published in 2017								
91. AIDA[279]	Median	BVS vs. CoCr-EES	924:921	64	74	18	DAPT ≥12 months	All-comer design

	1.9 years

ACS: acute coronary syndrome; AMI: acute myocardial infarction; BMS: bare metal stents; BP-BES: biodegradable polymer biolimus-eluting stents; BP-EES: biodegradable polymer everolimus-eluting stents; BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents; CVA: cerebrovascular accidents; dual DES: polymer-free sirolimus- and probucol-eluting stents; E-ZES: Endeavor zotarolimus-eluting stents; LL: late loss; MACE: major adverse cardiovascular events; MI: myocardial infarction; MLD: minimal lumen diameter; NIH: neointimal hyperplasia; NSTEMI: non-ST-segement elevation MI; OCT: optical coherence tomography; O-SES: Orsiro sirolimus-eluting stents; PES: paclitaxel-eluting stents; POCE: patient-oriented composite endpoint; PtCr-EES: platinum-chromium everolimus-eluting stents; QCA: quantitative coronary angiography; R-ZES: Resolute zotarolimus-eluting stents; SES: sirolimus-eluting stents; ST: stent thrombosis; STEMI: ST-segement elevation MI; TAT: triple antiplatelet therapy; TLF: target lesion failure; TLR: target lesion revascularisation; TVF: target vessel failure; TVR: target vessel revascularisation

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Supplementary Table 2. Results from network meta-regression adjusted for covariates in terms of long-term definite or probable stent thrombosis of Absorb bioresorbable vascular scaffold (BVS).

	Risk of long-term definite or probable stent thrombosis of BVS				
	Unadjusted	**Adjusted for age**	**Adjusted for sex**	**Adjusted for diabetes**	**Adjusted for DAPT duration**
vs. PES	1.85 (1.01-3.55)	1.84 (1.05-3.67)	1.81 (1.00-3.21)	1.91 (0.90-3.58)	1.00 (1.00-1.00)
vs. BMS	2.00 (1.10-3.99)	1.87 (1.05-3.66)	1.81 (0.99-3.32)	1.92 (0.92-3.74)	1.57 (0.91-2.97)
vs. SES	2.14 (1.14-4.09)	2.10 (1.19-4.09)	2.00 (1.12-3.55)	2.18 (1.07-4.06)	1.73 (0.98-3.33)
vs. R-ZES	3.26 (1.68-6.60)	3.19 (1.66-6.82)	3.15 (1.65-5.95)	3.41 (1.57-6.72)	1.81 (1.04-3.43)
vs. E-ZES	3.33 (1.75-7.13)	3.25 (1.76-6.55)	3.15 (1.69-6.14)	3.42 (1.64-6.67)	2.97 (0.76-18.7)
vs. BP-BES	3.47 (1.81-7.24)	3.36 (1.42-9.08)	3.36 (1.26-8.55)	3.60 (1.79-7.09)	2.79 (1.53-5.60)
vs. PtCr-EES	3.72 (1.46-8.38)	3.52 (1.94-7.13)	3.40 (1.86-6.20)	3.65 (1.33-9.03)	2.89 (1.26-5.90)
vs. Dual DES	3.75 (1.48-9.23)	3.60 (1.50-9.94)	3.59 (1.56-8.31)	3.71 (1.35-9.43)	3.01 (0.72-7.82)
vs. CoCr-EES	4.11 (2.32-7.44)	4.05 (2.40-7.55)	3.94 (2.37-6.81)	4.24 (2.18-7.72)	3.09 (1.62-6.10)
vs. H-SES	5.30 (2.49-11.2)	5.06 (1.00-26.2)	5.09 (2.40-10.5)	5.16 (0.97-31.0)	3.55 (2.02-6.46)
vs. BP-EES	5.63 (1.13-25.6)	5.15 (2.53-11.3)	5.35 (1.09-29.8)	5.18 (2.49-11.4)	4.57 (2.26-9.72)

Odds ratios and 95% credible intervals are presented.

BMS: bare metal stents; BP-BES: biodegradable polymer biolimus-eluting stents; BP-EES: biodegradable polymer everolimus-eluting stents; BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents; dual DES: sirolimus- and probucol-eluting stents; E-ZES: Endeavor zotarolimus-eluting stents; H-SES: Orsiro hybrid sirolimus-eluting stents; PES: paclitaxel-eluting stents; PtCr-EES: platinum-chromium everolimus-eluting stents; R-ZES: Resolute zotarolimus-eluting stents; SES: sirolimus-eluting stents

Supplementary Table 3. Pairwise comparisons of very late definite or probable stent thrombosis between study stents.

	BVS	SES	PES	BMS	CoCr-EES	R-ZES	BP-BES	H-SES	BP-EES	PtCr-EES	E-ZES	Dual DES
vs. BVS	-	0.23 (0.05-0.78)	0.20 (0.05-0.69)	0.11 (0.02-0.38)	0.10 (0.02-0.35)	0.09 (0.02-0.36)	0.09 (0.02-0.34)	0.07 (0.01-0.34)	0.06 (0.00-2.70)	0.06 (0.01-0.32)	0.06 (0.01-0.23)	0.05 (0.01-0.37)
vs. SES	4.33 (1.28-19.2)	-	0.87 (0.60-1.24)	0.46 (0.30-0.69)	0.44 (0.28-0.63)	0.41 (0.19-0.81)	0.40 (0.22-0.72)	0.31 (0.10-0.89)	0.28 (0.00-8.88)	0.27 (0.07-0.86)	0.26 (0.15-0.44)	0.21 (0.04-1.11)
vs. PES	4.98 (1.45-21.7)	1.14 (0.81-1.66)	-	0.54 (0.34-0.81)	0.50 (0.33-0.74)	0.47 (0.22-0.96)	0.46 (0.25-0.87)	0.35 (0.12-1.01)	0.32 (0.01-10.4)	0.31 (0.08-1.02)	0.30 (0.16-0.54)	0.24 (0.05-1.35)
vs. BMS	9.44 (2.66-44.6)	2.16 (1.45-3.32)	1.87 (1.24-2.94)	-	0.94 (0.58-1.52)	0.88 (0.40-1.89)	0.87 (0.46-1.66)	0.67 (0.22-1.99)	0.61 (0.01-18.6)	0.59 (0.15-1.99)	0.56 (0.29-1.08)	0.46 (0.08-2.56)
vs. CoCr-EES	10.0 (2.85-42.9)	2.29 (1.58-3.51)	2.00 (1.34-3.03)	1.06 (0.66-1.72)	-	0.93 (0.49-1.86)	0.93 (0.53-1.65)	0.70 (0.26-1.86)	0.65 (0.01-20.2)	0.63 (0.17-1.92)	0.60 (0.31-1.13)	0.49 (0.10-2.56)
vs. R-ZES	11.0 (2.79-50.6)	2.47 (1.23-5.19)	2.13 (1.04-4.55)	1.13 (0.53-2.50)	1.08 (0.54-2.05)	-	0.99 (0.47-2.07)	0.76 (0.22-2.43)	0.70 (0.01-21.9)	0.66 (0.20-1.95)	0.63 (0.27-1.55)	0.53 (0.12-2.39)
vs. BP-BES	10.9 (2.90-52.4)	2.47 (1.40-4.55)	2.16 (1.15-4.08)	1.14 (0.60-2.18)	1.08 (0.61-1.88)	1.01 (0.48-2.11)	-	0.76 (0.24-2.32)	0.69 (0.01-23.1)	0.67 (0.17-2.31)	0.64 (0.29-1.42)	0.52 (0.10-2.96)
vs. H-SES	14.3 (2.97-86.5)	3.26 (1.13-9.60)	2.82 (0.99-8.37)	1.50 (0.50-4.57)	1.43 (0.54-3.80)	1.31 (0.41-4.48)	1.31 (0.43-4.19)	-	0.92 (0.01-33.3)	0.87 (0.18-4.02)	0.84 (0.25-2.79)	0.70 (0.10-5.13)
vs. BP-EES	15.6 (0.37->100)	3.56 (0.11->100)	3.11 (0.10->100)	1.64 (0.05->100)	1.55 (0.05-89.5)	1.43 (0.05-90.5)	1.46 (0.04-91.9)	1.08 (0.03-90.4)	-	0.95 (0.04-47.1)	0.91 (0.03-51.5)	0.76 (0.02-63.7)
vs. PtCr-EES	16.3 (3.10->100)	3.64 (1.16-14.2)	3.19 (0.98-12.4)	1.70 (0.50-6.54)	1.58 (0.52-5.77)	1.51 (0.51-5.04)	1.50 (0.43-5.73)	1.15 (0.25-5.44)	1.05 (0.02-28.4)	-	0.96 (0.27-3.87)	0.81 (0.11-5.31)
vs. E-ZES	16.8 (4.39-84.0)	3.86 (2.27-6.84)	3.37 (1.85-6.19)	1.79 (0.93-3.47)	1.67 (0.89-3.27)	1.58 (0.64-3.75)	1.56 (0.71-3.49)	1.19 (0.36-3.96)	1.09 (0.02-36.7)	1.05 (0.26-3.74)	-	0.82 (0.14-4.59)
vs. Dual DES	20.0 (2.71->100)	4.72 (0.90-24.3)	4.11 (0.74-21.7)	2.17 (0.39-12.2)	2.06 (0.39-10.4)	1.89 (0.42-8.63)	1.91 (0.34-10.5)	1.43 (0.19-9.77)	1.31 (0.02-53.6)	1.23 (0.19-8.86)	1.22 (0.22-7.12)	-

Odds ratios and 95% credible intervals are presented. Comparisons with significantly lower risk are highlighted with red, and those with higher risk with blue.

BMS: bare metal stents; BP-BES: biodegradable polymer biolimus-eluting stents; BP-EES: biodegradable polymer everolimus-eluting stents; BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents; dual DES: sirolimus- and probucol-eluting stents; E-ZES: Endeavor zotarolimus-eluting stents; H-SES: Orsiro hybrid sirolimus-eluting stents; PES: paclitaxel-eluting stents; PtCr-EES: platinum-chromium everolimus-eluting stents; R-ZES: Resolute zotarolimus-eluting stents; SES: sirolimus-eluting stents

Supplementary Table 4. Pairwise comparisons of long-term definite stent thrombosis between study stents.

	BVS	PES	SES	BMS	Dual DES	R-ZES	BP-BES	PtCr-EES	BP-EES	E-ZES	H-SES	CoCr-EES
vs. BVS	-	0.37 (0.15-0.87)	0.36 (0.15-0.83)	0.36 (0.14-0.84)	0.31 (0.09-1.11)	0.27 (0.10-0.70)	0.27 (0.10-0.65)	0.23 (0.07-0.72)	0.21 (0.03-2.06)	0.20 (0.08-0.55)	0.17 (0.05-0.48)	0.16 (0.07-0.35)
vs. PES	2.70 (1.15-6.56)	-	0.96 (0.72-1.27)	0.94 (0.72-1.29)	0.81 (0.33-2.20)	0.73 (0.41-1.31)	0.72 (0.48-1.08)	0.62 (0.27-1.47)	0.56 (0.09-4.55)	0.55 (0.36-0.88)	0.45 (0.21-0.95)	0.43 (0.32-0.59)
vs. SES	2.81 (1.20-6.88)	1.04 (0.79-1.39)	-	0.99 (0.75-1.31)	0.85 (0.36-2.26)	0.76 (0.45-1.33)	0.75 (0.53-1.08)	0.65 (0.29-1.53)	0.58 (0.09-4.85)	0.57 (0.40-0.87)	0.47 (0.22-0.95)	0.45 (0.33-0.62)
vs. BMS	2.80 (1.19-7.03)	1.06 (0.77-1.40)	1.01 (0.76-1.34)	-	0.86 (0.35-2.29)	0.76 (0.43-1.37)	0.76 (0.50-1.15)	0.65 (0.27-1.57)	0.59 (0.09-4.66)	0.58 (0.36-0.94)	0.48 (0.22-0.99)	0.45 (0.32-0.64)
vs. Dual DES	3.24 (0.90-10.7)	1.24 (0.45-2.99)	1.18 (0.44-2.79)	1.17 (0.44-2.88)	-	0.91 (0.36-2.00)	0.89 (0.33-2.13)	0.76 (0.23-2.30)	0.67 (0.10-6.41)	0.68 (0.25-1.74)	0.56 (0.17-1.58)	0.53 (0.20-1.28)
vs. R-ZES	3.67 (1.44-9.83)	1.37 (0.77-2.42)	1.32 (0.75-2.24)	1.31 (0.73-2.32)	1.10 (0.50-2.80)	-	0.99 (0.58-1.66)	0.85 (0.39-1.85)	0.76 (0.13-6.05)	0.75 (0.40-1.47)	0.63 (0.26-1.36)	0.60 (0.35-0.97)
vs. BP-BES	3.69 (1.53-9.55)	1.39 (0.92-2.08)	1.33 (0.93-1.89)	1.32 (0.87-1.99)	1.12 (0.47-3.05)	1.01 (0.60-1.72)	-	0.85 (0.37-2.10)	0.78 (0.13-6.28)	0.76 (0.47-1.34)	0.62 (0.31-1.23)	0.60 (0.41-0.88)
vs. PtCr-EES	4.38 (1.40-14.0)	1.62 (0.68-3.72)	1.55 (0.65-3.48)	1.53 (0.64-3.68)	1.31 (0.43-4.37)	1.17 (0.54-2.58)	1.17 (0.48-2.72)	-	0.90 (0.20-5.94)	0.89 (0.35-2.19)	0.73 (0.25-2.07)	0.70 (0.30-1.61)
vs. BP-EES	4.75 (0.49-37.1)	1.78 (0.22-11.2)	1.73 (0.21-10.6)	1.70 (0.21-10.6)	1.49 (0.16-10.4)	1.31 (0.17-7.69)	1.28 (0.16-7.86)	1.11 (0.17-5.12)	-	1.00 (0.12-5.97)	0.78 (0.09-5.27)	0.76 (0.09-4.62)
vs. E-ZES	4.93 (1.83-12.5)	1.82 (1.14-2.79)	1.76 (1.15-2.51)	1.73 (1.06-2.77)	1.48 (0.57-4.01)	1.33 (0.68-2.51)	1.32 (0.75-2.15)	1.12 (0.46-2.89)	1.00 (0.17-8.55)	-	0.84 (0.35-1.75)	0.78 (0.48-1.30)
vs. H-SES	5.85 (2.07-18.5)	2.22 (1.05-4.74)	2.12 (1.06-4.50)	2.08 (1.01-4.51)	1.80 (0.63-5.88)	1.59 (0.73-3.81)	1.60 (0.81-3.22)	1.36 (0.48-4.04)	1.28 (0.19-11.3)	1.19 (0.57-2.87)	-	0.95 (0.49-1.96)
vs. CoCr-EES	6.21 (2.87-14.8)	2.32 (1.70-3.12)	2.23 (1.62-3.03)	2.21 (1.57-3.10)	1.88 (0.78-5.02)	1.67 (1.03-2.88)	1.66 (1.13-2.43)	1.42 (0.62-3.34)	1.31 (0.22-10.6)	1.28 (0.77-2.10)	1.06 (0.51-2.05)	-

Odds ratios and 95% credible intervals are presented. Comparisons with significantly lower risk are highlighted with red, and those with higher risk with blue.

BMS: bare metal stents; BP-BES: biodegradable polymer biolimus-eluting stents; BP-EES: biodegradable polymer everolimus-eluting stents; BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents; dual DES: sirolimus- and probucol-eluting stents; E-ZES: Endeavor zotarolimus-eluting stents; H-SES: Orsiro hybrid sirolimus-eluting stents; PES: paclitaxel-eluting stents; PtCr-EES: platinum-chromium everolimus-eluting stents; R-ZES: Resolute zotarolimus-eluting stents; SES: sirolimus-eluting stents

Supplementary Table 5. Pairwise comparisons of very late definite stent thrombosis between study stents.

	BVS	SES	PES	BP-BES	CoCr-EES	BMS	H-SES	R-ZES	PtCr-EES	BP-EES	Dual DES	E-ZES
vs. BVS	-	0.20 (0.02-0.86)	0.16 (0.02-0.72)	0.10 (0.01-0.42)	0.09 (0.01-0.39)	0.08 (0.01-0.39)	0.08 (0.01-0.55)	0.07 (0.01-0.33)	0.05 (0.00-0.33)	0.04 (0.00-2.06)	0.05 (0.00-0.73)	0.03 (0.00-0.14)
vs. SES	5.00 (1.16-46.9)	-	0.79 (0.52-1.15)	0.48 (0.27-0.86)	0.45 (0.28-0.72)	0.41 (0.26-0.66)	0.40 (0.11-1.28)	0.33 (0.15-0.80)	0.28 (0.05-1.00)	0.25 (0.01-7.64)	0.25 (0.03-2.74)	0.15 (0.07-0.28)
vs. PES	6.42 (1.39-60.4)	1.26 (0.87-1.91)	-	0.62 (0.33-1.17)	0.57 (0.36-0.96)	0.52 (0.32-0.87)	0.51 (0.14-1.72)	0.42 (0.18-1.07)	0.34 (0.06-1.52)	0.31 (0.01-9.80)	0.32 (0.04-3.60)	0.19 (0.09-0.39)
vs. BP-BES	10.3 (2.39-93.3)	2.07 (1.17-3.67)	1.62 (0.86-3.08)	-	0.93 (0.52-1.69)	0.84 (0.44-1.66)	0.84 (0.23-2.52)	0.69 (0.31-1.53)	0.56 (0.12-2.06)	0.50 (0.01-15.5)	0.52 (0.06-5.39)	0.31 (0.12-0.73)
vs. CoCr-EES	11.4 (2.59-95.3)	2.21 (1.40-3.56)	1.75 (1.05-2.77)	1.08 (0.59-1.91)	-	0.90 (0.52-1.59)	0.89 (0.26-2.71)	0.74 (0.34-1.67)	0.59 (0.10-2.50)	0.55 (0.01-16.4)	0.56 (0.07-5.63)	0.32 (0.14-0.72)
vs. BMS	12.7 (2.58->100)	2.43 (1.51-3.91)	1.94 (1.15-3.08)	1.19 (0.60-2.25)	1.12 (0.63-1.93)	-	0.98 (0.27-3.31)	0.82 (0.33-2.09)	0.66 (0.11-3.10)	0.62 (0.02-18.9)	0.60 (0.07-7.54)	0.36 (0.15-0.79)
vs. H-SES	13.2 (1.83->100)	2.49 (0.78-8.86)	1.97 (0.58-7.05)	1.20 (0.40-4.28)	1.12 (0.37-3.81)	1.02 (0.30-3.65)	-	0.82 (0.22-3.59)	0.67 (0.08-5.11)	0.59 (0.01-24.0)	0.65 (0.06-7.76)	0.36 (0.10-1.57)
vs. R-ZES	14.6 (2.99->100)	3.00 (1.24-6.79)	2.38 (0.94-5.44)	1.46 (0.65-3.19)	1.36 (0.60-2.95)	1.22 (0.48-3.07)	1.22 (0.28-4.56)	-	0.80 (0.21-2.58)	0.74 (0.02-20.9)	0.75 (0.10-6.80)	0.45 (0.14-1.19)
vs. PtCr-EES	20.2 (3.06->100)	3.63 (1.00-22.2)	2.92 (0.66-18.0)	1.79 (0.49-8.43)	1.68 (0.40-9.92)	1.52 (0.32-9.48)	1.49 (0.20-12.8)	1.24 (0.39-4.70)	-	0.86 (0.03-21.6)	0.97 (0.10-10.9)	0.54 (0.12-3.27)
vs. BP-EES	25.0 (0.49->100)	4.02 (0.13->100)	3.18 (0.10->100)	1.98 (0.06-67.4)	1.82 (0.06-69.0)	1.61 (0.05-66.5)	1.69 (0.04-74.1)	1.36 (0.05-44.9)	1.16 (0.05-28.8)	-	1.06 (0.02-59.9)	0.60 (0.02-21.3)
vs. Dual DES	20.2 (1.37->100)	4.01 (0.36-32.5)	3.12 (0.28-25.8)	1.93 (0.19-16.5)	1.79 (0.18-14.6)	1.66 (0.13-13.8)	1.54 (0.13-18.1)	1.33 (0.15-9.95)	1.03 (0.09-10.2)	0.94 (0.02-45.8)	-	0.59 (0.05-4.95)
vs. E-ZES	34.7 (7.20->100)	6.73 (3.51-14.6)	5.36 (2.59-11.7)	3.22 (1.38-8.19)	3.08 (1.39-7.29)	2.78 (1.27-6.60)	2.80 (0.64-10.5)	2.22 (0.84-6.96)	1.85 (0.31-8.20)	1.68 (0.05-53.7)	1.69 (0.20-19.4)	-

Odds ratios and 95% credible intervals are presented. Comparisons with significantly lower risk are highlighted with red, and those with higher risk with blue.

BMS: bare metal stents; BP-BES: biodegradable polymer biolimus-eluting stents; BP-EES: biodegradable polymer everolimus-eluting stents; BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents; dual DES: sirolimus- and probucol-eluting stents; E-ZES: Endeavor zotarolimus-eluting stents; H-SES: Orsiro hybrid sirolimus-eluting stents; PES: paclitaxel-eluting stents; PtCr-EES: platinum-chromium everolimus-eluting stents; R-ZES: Resolute zotarolimus-eluting stents; SES: sirolimus-eluting stents

Supplementary Table 6. Pairwise comparisons of all-cause death between study stents.

	H-SES	BMS	SES	E-ZES	PES	BP-BES	CoCr-EES	R-ZES	BP-EES	PtCr-EES	Dual DES	BVS
vs. H-SES	-	0.86 (0.54-1.35)	0.81 (0.51-1.26)	0.78 (0.49-1.24)	0.77 (0.49-1.20)	0.68 (0.42-1.08)	0.66 (0.42-1.00)	0.64 (0.39-1.03)	0.60 (0.24-1.54)	0.61 (0.35-1.07)	0.55 (0.32-0.92)	0.52 (0.30-0.90)
vs. BMS	1.16 (0.74-1.85)	-	0.94 (0.82-1.07)	0.91 (0.75-1.09)	0.89 (0.77-1.04)	0.79 (0.64-0.97)	0.76 (0.65-0.88)	0.74 (0.59-0.93)	0.71 (0.31-1.57)	0.70 (0.49-1.02)	0.63 (0.46-0.88)	0.61 (0.42-0.85)
vs. SES	1.24 (0.79-1.96)	1.07 (0.93-1.22)	-	0.97 (0.83-1.12)	0.95 (0.84-1.07)	0.84 (0.70-1.01)	0.81 (0.72-0.91)	0.79 (0.64-0.98)	0.76 (0.33-1.65)	0.75 (0.53-1.07)	0.68 (0.51-0.91)	0.65 (0.46-0.90)
vs. E-ZES	1.28 (0.80-2.06)	1.10 (0.92-1.33)	1.03 (0.89-1.20)	-	0.99 (0.83-1.17)	0.87 (0.69-1.10)	0.84 (0.70-1.00)	0.81 (0.64-1.05)	0.78 (0.34-1.74)	0.78 (0.53-1.14)	0.70 (0.51-0.97)	0.67 (0.46-0.95)
vs. PES	1.30 (0.83-2.05)	1.12 (0.96-1.29)	1.05 (0.93-1.19)	1.02 (0.85-1.20)	-	0.88 (0.72-1.08)	0.85 (0.74-0.98)	0.83 (0.66-1.05)	0.80 (0.35-1.76)	0.79 (0.55-1.13)	0.71 (0.52-0.98)	0.68 (0.47-0.96)
vs. BP-BES	1.48 (0.93-2.40)	1.27 (1.03-1.55)	1.19 (0.99-1.42)	1.16 (0.91-1.45)	1.14 (0.93-1.38)	-	0.97 (0.81-1.14)	0.94 (0.76-1.16)	0.91 (0.40-1.99)	0.89 (0.62-1.29)	0.81 (0.59-1.09)	0.77 (0.54-1.09)
vs. CoCr-EES	1.52 (1.00-2.40)	1.32 (1.14-1.53)	1.23 (1.10-1.39)	1.19 (1.00-1.44)	1.18 (1.02-1.35)	1.03 (0.88-1.23)	-	0.98 (0.80-1.18)	0.94 (0.41-2.04)	0.93 (0.66-1.31)	0.84 (0.63-1.12)	0.80 (0.58-1.09)
vs. R-ZES	1.57 (0.97-2.55)	1.35 (1.07-1.70)	1.27 (1.02-1.57)	1.23 (0.95-1.56)	1.21 (0.95-1.51)	1.06 (0.86-1.32)	1.02 (0.85-1.24)	-	0.97 (0.41-2.07)	0.95 (0.68-1.33)	0.86 (0.67-1.09)	0.82 (0.56-1.18)
vs. BP-EES	1.66 (0.65-4.14)	1.41 (0.64-3.19)	1.31 (0.61-3.01)	1.28 (0.57-2.93)	1.26 (0.57-2.86)	1.10 (0.50-2.52)	1.07 (0.49-2.44)	1.03 (0.48-2.42)	-	0.99 (0.51-2.06)	0.89 (0.40-2.13)	0.86 (0.36-2.09)
vs. PtCr-EES	1.64 (0.94-2.85)	1.42 (0.98-2.04)	1.33 (0.93-1.89)	1.29 (0.88-1.88)	1.27 (0.89-1.81)	1.12 (0.77-1.61)	1.08 (0.76-1.51)	1.05 (0.75-1.47)	1.01 (0.48-1.97)	-	0.90 (0.60-1.35)	0.86 (0.52-1.36)
vs. Dual DES	1.83 (1.09-3.08)	1.58 (1.14-2.17)	1.47 (1.09-1.98)	1.43 (1.03-1.97)	1.41 (1.02-1.91)	1.24 (0.92-1.70)	1.20 (0.89-1.60)	1.17 (0.91-1.49)	1.12 (0.47-2.52)	1.11 (0.74-1.68)	-	0.96 (0.62-1.44)
vs. BVS	1.92 (1.12-3.34)	1.65 (1.18-2.35)	1.54 (1.12-2.18)	1.50 (1.05-2.16)	1.47 (1.05-2.11)	1.30 (0.91-1.85)	1.26 (0.92-1.73)	1.21 (0.85-1.77)	1.17 (0.48-2.75)	1.16 (0.73-1.91)	1.04 (0.69-1.62)	-

Odds ratios and 95% credible intervals are presented. Comparisons with significantly lower risk are highlighted with red, and those with higher risk with blue.

BMS: bare metal stents; BP-BES: biodegradable polymer biolimus-eluting stents; BP-EES: biodegradable polymer everolimus-eluting stents; BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents; dual DES: sirolimus- and probucol-eluting stents; E-ZES: Endeavor zotarolimus-eluting stents; H-SES: Orsiro hybrid sirolimus-eluting stents; PES: paclitaxel-eluting stents; PtCr-EES: platinum-chromium everolimus-eluting stents; R-ZES: Resolute zotarolimus-eluting stents; SES: sirolimus-eluting stents

Supplementary Table 7. Pairwise comparisons of cardiac death between study stents.

	BMS	SES	E-ZES	H-SES	BP-BES	PES	CoCr-EES	Dual DES	PtCr-EES	R-ZES	BVS	BP-EES
vs. BMS	-	0.98 (0.80-1.21)	0.88 (0.66-1.18)	0.88 (0.54-1.43)	0.83 (0.61-1.09)	0.78 (0.64-0.97)	0.76 (0.60-0.95)	0.69 (0.39-1.18)	0.68 (0.38-1.15)	0.68 (0.46-0.99)	0.66 (0.40-1.11)	0.57 (0.21-1.38)
vs. SES	1.02 (0.83-1.26)	-	0.90 (0.71-1.16)	0.89 (0.56-1.43)	0.85 (0.65-1.09)	0.80 (0.66-0.97)	0.78 (0.64-0.93)	0.70 (0.41-1.19)	0.69 (0.40-1.17)	0.69 (0.49-0.98)	0.67 (0.41-1.12)	0.58 (0.23-1.40)
vs. E-ZES	1.13 (0.85-1.51)	1.11 (0.87-1.40)	-	0.99 (0.59-1.68)	0.95 (0.65-1.32)	0.89 (0.68-1.17)	0.86 (0.63-1.15)	0.78 (0.43-1.38)	0.77 (0.42-1.36)	0.77 (0.50-1.17)	0.75 (0.43-1.31)	0.65 (0.24-1.58)
vs. H-SES	1.14 (0.70-1.86)	1.12 (0.70-1.78)	1.01 (0.60-1.70)	-	0.95 (0.60-1.46)	0.90 (0.55-1.45)	0.87 (0.55-1.34)	0.78 (0.40-1.50)	0.77 (0.39-1.47)	0.77 (0.46-1.30)	0.75 (0.40-1.47)	0.65 (0.23-1.65)
vs. BP-BES	1.20 (0.92-1.63)	1.18 (0.92-1.54)	1.06 (0.76-1.53)	1.05 (0.68-1.66)	-	0.94 (0.70-1.30)	0.91 (0.73-1.16)	0.83 (0.49-1.40)	0.81 (0.48-1.36)	0.81 (0.59-1.14)	0.80 (0.48-1.35)	0.69 (0.27-1.64)
vs. PES	1.28 (1.03-1.57)	1.25 (1.03-1.51)	1.13 (0.85-1.47)	1.12 (0.69-1.82)	1.06 (0.77-1.42)	-	0.97 (0.76-1.21)	0.87 (0.50-1.51)	0.87 (0.48-1.47)	0.87 (0.59-1.28)	0.84 (0.50-1.43)	0.73 (0.28-1.74)
vs. CoCr-EES	1.31 (1.05-1.66)	1.29 (1.08-1.56)	1.16 (0.87-1.58)	1.15 (0.74-1.81)	1.10 (0.86-1.38)	1.03 (0.82-1.31)	-	0.90 (0.54-1.51)	0.89 (0.53-1.44)	0.89 (0.66-1.22)	0.87 (0.55-1.40)	0.75 (0.30-1.75)
vs. Dual DES	1.46 (0.85-2.55)	1.42 (0.84-2.47)	1.28 (0.73-2.32)	1.28 (0.67-2.49)	1.21 (0.72-2.05)	1.14 (0.66-2.01)	1.11 (0.66-1.85)	-	0.98 (0.53-1.83)	0.99 (0.65-1.49)	0.97 (0.49-1.94)	0.83 (0.31-2.10)
vs. PtCr-EES	1.46 (0.87-2.63)	1.44 (0.86-2.49)	1.29 (0.74-2.37)	1.29 (0.68-2.57)	1.23 (0.73-2.10)	1.15 (0.68-2.06)	1.12 (0.69-1.88)	1.02 (0.55-1.88)	-	1.00 (0.64-1.58)	0.97 (0.51-1.99)	0.84 (0.39-1.77)
vs. R-ZES	1.47 (1.01-2.15)	1.44 (1.02-2.05)	1.30 (0.85-1.98)	1.29 (0.77-2.18)	1.23 (0.87-1.70)	1.15 (0.78-1.70)	1.12 (0.82-1.52)	1.01 (0.67-1.53)	1.00 (0.63-1.57)	-	0.97 (0.57-1.75)	0.84 (0.34-1.96)
vs. BVS	1.51 (0.90-2.52)	1.48 (0.89-2.43)	1.34 (0.77-2.30)	1.33 (0.68-2.49)	1.26 (0.74-2.09)	1.19 (0.70-1.99)	1.15 (0.72-1.82)	1.04 (0.52-2.05)	1.03 (0.50-1.98)	1.03 (0.57-1.77)	-	0.87 (0.30-2.28)
vs. BP-EES	1.75 (0.72-4.68)	1.73 (0.71-4.42)	1.55 (0.63-4.16)	1.53 (0.61-4.35)	1.45 (0.61-3.71)	1.37 (0.57-3.62)	1.33 (0.57-3.36)	1.20 (0.48-3.27)	1.18 (0.56-2.59)	1.19 (0.51-2.94)	1.15 (0.44-3.31)	-

Odds ratios and 95% credible intervals are presented. Comparisons with significantly lower risk are highlighted with red, and those with higher risk with blue.

BMS: bare metal stents; BP-BES: biodegradable polymer biolimus-eluting stents; BP-EES: biodegradable polymer everolimus-eluting stents; BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents; dual DES: sirolimus- and probucol-eluting stents; E-ZES: Endeavor zotarolimus-eluting stents; H-SES: Orsiro hybrid sirolimus-eluting stents; PES: paclitaxel-eluting stents; PtCr-EES: platinum-chromium everolimus-eluting stents; R-ZES: Resolute zotarolimus-eluting stents; SES: sirolimus-eluting stents

Supplementary Table 8. Pairwise comparisons of myocardial infarction between study stents.

	BVS	PES	BMS	SES	BP-EES	BP-BES	CoCr-EES	R-ZES	E-ZES	Dual DES	H-SES	PtCr-EES
vs. BVS	-	0.93 (0.67-1.23)	0.86 (0.61-1.15)	0.73 (0.55-0.97)	0.65 (0.33-1.30)	0.64 (0.46-0.87)	0.61 (0.47-0.79)	0.59 (0.42-0.84)	0.57 (0.41-0.78)	0.58 (0.36-0.89)	0.55 (0.37-0.80)	0.52 (0.29-0.84)
vs. PES	1.08 (0.81-1.49)	-	0.93 (0.81-1.09)	0.79 (0.69-0.89)	0.70 (0.39-1.32)	0.69 (0.57-0.85)	0.66 (0.58-0.77)	0.64 (0.50-0.81)	0.62 (0.52-0.73)	0.62 (0.42-0.89)	0.60 (0.44-0.83)	0.56 (0.35-0.90)
vs. BMS	1.16 (0.87-1.63)	1.07 (0.92-1.24)	-	0.85 (0.73-0.99)	0.75 (0.41-1.43)	0.74 (0.59-0.91)	0.71 (0.60-0.84)	0.69 (0.54-0.88)	0.67 (0.54-0.81)	0.66 (0.45-0.96)	0.64 (0.46-0.89)	0.60 (0.38-0.96)
vs. SES	1.37 (1.03-1.83)	1.26 (1.12-1.44)	1.17 (1.01-1.38)	-	0.88 (0.49-1.64)	0.88 (0.68-1.06)	0.84 (0.74-0.96)	0.81 (0.64-1.03)	0.79 (0.68-0.90)	0.78 (0.55-1.14)	0.75 (0.56-1.03)	0.71 (0.44-1.13)
vs. BP-EES	1.54 (0.77-3.02)	1.42 (0.76-2.57)	1.34 (0.70-2.42)	1.14 (0.61-2.05)	-	0.98 (0.53-1.81)	0.94 (0.51-1.72)	0.91 (0.50-1.67)	0.90 (0.47-1.63)	0.88 (0.44-1.69)	0.86 (0.44-1.64)	0.79 (0.53-1.21)
vs. BP-BES	1.57 (1.15-2.15)	1.44 (1.18-1.77)	1.34 (1.09-1.70)	1.14 (0.95-1.47)	1.02 (0.55-1.90)	-	0.95 (0.81-1.15)	0.93 (0.72-1.16)	0.89 (0.71-1.23)	0.89 (0.61-1.31)	0.86 (0.64-1.15)	0.81 (0.50-1.28)
vs. CoCr-EES	1.64 (1.27-2.12)	1.52 (1.29-1.74)	1.41 (1.19-1.66)	1.19 (1.04-1.36)	1.06 (0.58-1.94)	1.05 (0.87-1.24)	-	0.97 (0.78-1.19)	0.94 (0.77-1.13)	0.94 (0.65-1.34)	0.90 (0.67-1.21)	0.85 (0.53-1.31)
vs. R-ZES	1.68 (1.19-2.40)	1.56 (1.23-2.00)	1.46 (1.14-1.87)	1.23 (0.97-1.56)	1.10 (0.60-1.99)	1.07 (0.86-1.38)	1.03 (0.84-1.28)	-	0.97 (0.74-1.26)	0.96 (0.69-1.36)	0.93 (0.66-1.33)	0.87 (0.56-1.34)
vs. E-ZES	1.74 (1.28-2.44)	1.61 (1.36-1.92)	1.49 (1.23-1.86)	1.27 (1.11-1.48)	1.11 (0.61-2.12)	1.12 (0.82-1.41)	1.07 (0.89-1.29)	1.04 (0.79-1.36)	-	0.99 (0.69-1.47)	0.96 (0.69-1.37)	0.91 (0.56-1.48)
vs. Dual DES	1.74 (1.12-2.76)	1.60 (1.13-2.38)	1.52 (1.04-2.24)	1.29 (0.88-1.83)	1.14 (0.59-2.28)	1.12 (0.76-1.65)	1.07 (0.75-1.54)	1.04 (0.74-1.46)	1.01 (0.68-1.46)	-	0.97 (0.62-1.53)	0.90 (0.52-1.54)
vs. H-SES	1.81 (1.24-2.70)	1.67 (1.21-2.30)	1.57 (1.13-2.15)	1.34 (0.97-1.78)	1.17 (0.61-2.29)	1.16 (0.87-1.55)	1.11 (0.82-1.48)	1.07 (0.75-1.52)	1.05 (0.73-1.45)	1.03 (0.66-1.62)	-	0.94 (0.55-1.55)
vs. PtCr-EES	1.93 (1.19-3.41)	1.77 (1.12-2.83)	1.66 (1.04-2.63)	1.41 (0.88-2.25)	1.26 (0.83-1.90)	1.24 (0.78-1.98)	1.17 (0.76-1.88)	1.15 (0.75-1.78)	1.10 (0.67-1.80)	1.11 (0.65-1.91)	1.06 (0.64-1.83)	-

Odds ratios and 95% credible intervals are presented. Comparisons with significantly lower risk are highlighted with red, and those with higher risk with blue.

BMS: bare metal stents; BP-BES: biodegradable polymer biolimus-eluting stents; BP-EES: biodegradable polymer everolimus-eluting stents; BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents; dual DES: sirolimus- and probucol-eluting stents; E-ZES: Endeavor zotarolimus-eluting stents; H-SES: Orsiro hybrid sirolimus-eluting stents; PES: paclitaxel-eluting stents; PtCr-EES: platinum-chromium everolimus-eluting stents; R-ZES: Resolute zotarolimus-eluting stents; SES: sirolimus-eluting stents

Supplementary Table 9. Pairwise comparisons of target vessel revascularisation between study stents.

	BMS	PES	E-ZES	BVS	SES	H-SES	BP-BES	CoCr-EES	PtCr-EES	Dual DES	R-ZES	BP-EES
vs. BMS	-	0.57 (0.48-0.67)	0.49 (0.39-0.62)	0.48 (0.34-0.68)	0.42 (0.36-0.49)	0.42 (0.24-0.72)	0.41 (0.32-0.52)	0.39 (0.32-0.46)	0.37 (0.25-0.54)	0.37 (0.21-0.63)	0.36 (0.26-0.49)	0.33 (0.17-0.60)
vs. PES	1.76 (1.49-2.08)	-	0.86 (0.69-1.09)	0.85 (0.60-1.19)	0.74 (0.63-0.86)	0.73 (0.42-1.26)	0.71 (0.55-0.92)	0.68 (0.57-0.80)	0.65 (0.44-0.93)	0.65 (0.37-1.10)	0.64 (0.46-0.86)	0.57 (0.29-1.05)
vs. E-ZES	2.04 (1.61-2.58)	1.16 (0.92-1.45)	-	0.98 (0.66-1.42)	0.86 (0.69-1.05)	0.85 (0.47-1.51)	0.83 (0.60-1.11)	0.79 (0.61-1.00)	0.75 (0.49-1.12)	0.75 (0.41-1.32)	0.74 (0.51-1.05)	0.66 (0.33-1.26)
vs. BVS	2.08 (1.48-2.93)	1.18 (0.84-1.67)	1.02 (0.70-1.51)	-	0.88 (0.62-1.22)	0.87 (0.47-1.59)	0.85 (0.59-1.21)	0.80 (0.59-1.08)	0.76 (0.50-1.18)	0.76 (0.42-1.41)	0.76 (0.51-1.12)	0.68 (0.34-1.29)
vs. SES	2.37 (2.03-2.79)	1.35 (1.16-1.58)	1.16 (0.95-1.46)	1.14 (0.82-1.60)	-	0.99 (0.57-1.72)	0.96 (0.75-1.22)	0.92 (0.78-1.07)	0.87 (0.60-1.26)	0.87 (0.50-1.50)	0.86 (0.63-1.15)	0.77 (0.40-1.42)
vs. H-SES	2.39 (1.39-4.24)	1.36 (0.80-2.40)	1.17 (0.66-2.12)	1.15 (0.63-2.14)	1.01 (0.58-1.77)	-	0.98 (0.55-1.73)	0.93 (0.55-1.58)	0.88 (0.47-1.65)	0.88 (0.42-1.87)	0.87 (0.48-1.57)	0.78 (0.33-1.72)
vs. BP-BES	2.46 (1.93-3.17)	1.40 (1.09-1.82)	1.20 (0.90-1.66)	1.18 (0.83-1.71)	1.04 (0.82-1.33)	1.02 (0.58-1.83)	-	0.95 (0.76-1.19)	0.90 (0.62-1.34)	0.90 (0.52-1.56)	0.90 (0.66-1.20)	0.80 (0.41-1.48)
vs. CoCr-EES	2.59 (2.17-3.13)	1.47 (1.25-1.77)	1.27 (1.00-1.64)	1.24 (0.93-1.68)	1.09 (0.93-1.28)	1.08 (0.63-1.82)	1.05 (0.84-1.31)	-	0.95 (0.67-1.35)	0.95 (0.56-1.62)	0.94 (0.71-1.22)	0.84 (0.44-1.53)
vs. PtCr-EES	2.71 (1.86-4.01)	1.54 (1.07-2.25)	1.33 (0.89-2.05)	1.31 (0.85-2.01)	1.14 (0.79-1.66)	1.13 (0.61-2.11)	1.11 (0.75-1.63)	1.05 (0.74-1.49)	-	1.00 (0.55-1.82)	0.99 (0.68-1.44)	0.88 (0.52-1.45)
vs. Dual DES	2.72 (1.58-4.79)	1.54 (0.91-2.74)	1.33 (0.76-2.44)	1.31 (0.71-2.39)	1.14 (0.67-1.99)	1.14 (0.54-2.39)	1.11 (0.64-1.91)	1.05 (0.62-1.80)	1.00 (0.55-1.81)	-	0.99 (0.63-1.57)	0.88 (0.40-1.87)
vs. R-ZES	2.75 (2.03-3.82)	1.56 (1.16-2.18)	1.35 (0.96-1.96)	1.32 (0.90-1.95)	1.16 (0.87-1.57)	1.15 (0.64-2.07)	1.12 (0.83-1.52)	1.06 (0.82-1.40)	1.01 (0.70-1.46)	1.01 (0.64-1.59)	-	0.89 (0.47-1.64)
vs. BP-EES	3.07 (1.68-5.99)	1.74 (0.95-3.41)	1.51 (0.79-3.02)	1.48 (0.77-2.98)	1.29 (0.70-2.47)	1.29 (0.58-2.99)	1.25 (0.67-2.47)	1.19 (0.66-2.26)	1.14 (0.69-1.94)	1.13 (0.54-2.53)	1.12 (0.61-2.15)	-

Odds ratios and 95% credible intervals are presented. Comparisons with significantly lower risk are highlighted with red, and those with higher risk with blue.

BMS: bare metal stents; BP-BES: biodegradable polymer biolimus-eluting stents; BP-EES: biodegradable polymer everolimus-eluting stents; BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents; dual DES: sirolimus- and probucol-eluting stents; E-ZES: Endeavor zotarolimus-eluting stents; H-SES: Orsiro hybrid sirolimus-eluting stents; PES: paclitaxel-eluting stents; PtCr-EES: platinum-chromium everolimus-eluting stents; R-ZES: Resolute zotarolimus-eluting stents; SES: sirolimus-eluting stents

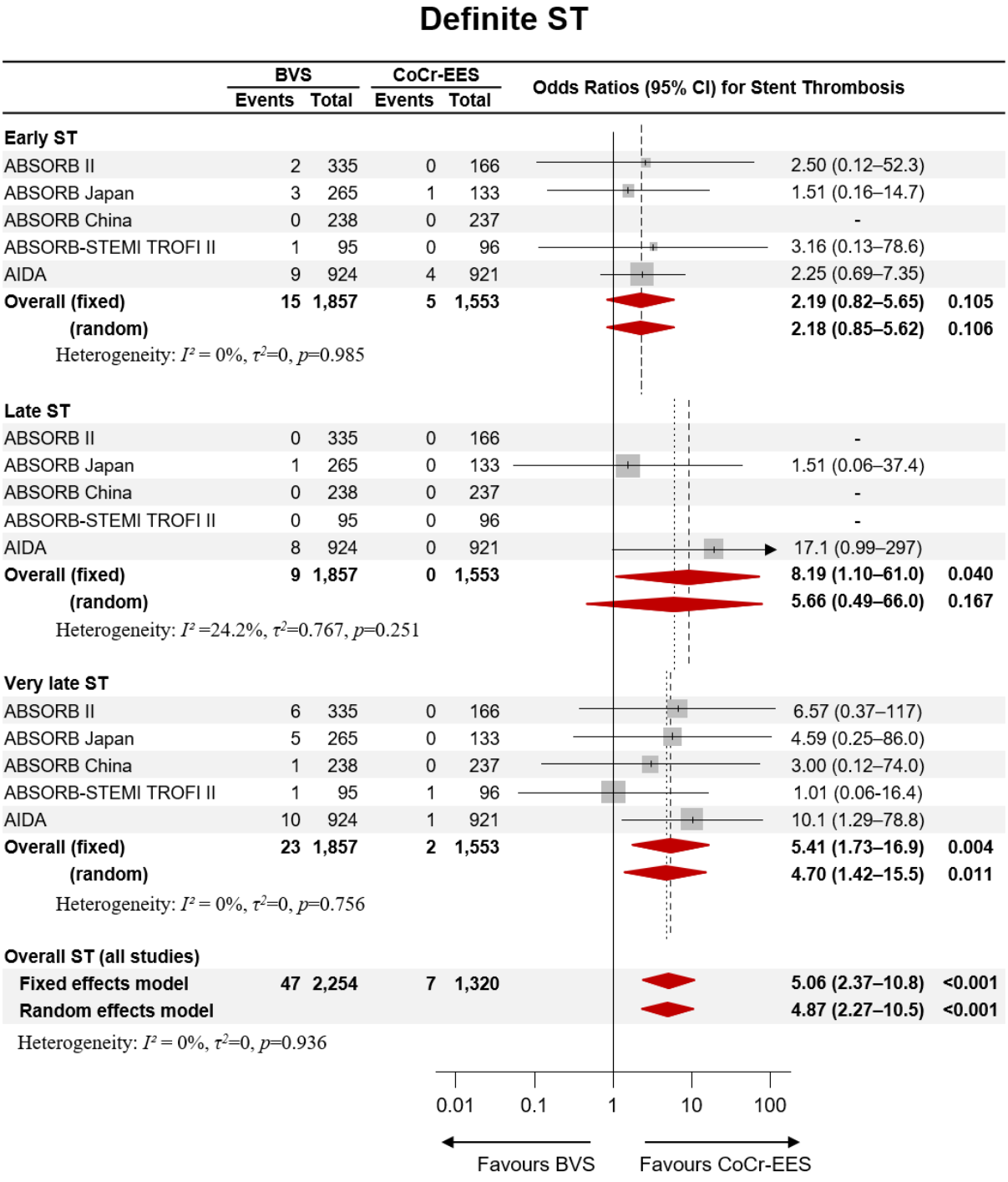
Supplementary Table 10. Pairwise comparisons of target lesion revascularisation between study stents.

	BMS	E-ZES	PES	BVS	SES	BP-BES	CoCr-EES	Dual DES	R-ZES	H-SES	BP-EES	PtCr-EES
vs. BMS	-	0.46 (0.35-0.61)	0.43 (0.35-0.52)	0.40 (0.26-0.61)	0.32 (0.26-0.38)	0.29 (0.20-0.39)	0.27 (0.22-0.34)	0.27 (0.14-0.53)	0.26 (0.18-0.38)	0.26 (0.16-0.43)	0.21 (0.09-0.48)	0.21 (0.12-0.34)
vs. E-ZES	2.17 (1.64-2.85)	-	0.93 (0.71-1.21)	0.86 (0.54-1.37)	0.69 (0.53-0.87)	0.62 (0.41-0.91)	0.59 (0.43-0.80)	0.58 (0.28-1.17)	0.57 (0.36-0.88)	0.57 (0.32-0.97)	0.45 (0.19-1.04)	0.45 (0.25-0.77)
vs. PES	2.32 (1.94-2.85)	1.07 (0.83-1.42)	-	0.92 (0.62-1.43)	0.74 (0.62-0.87)	0.66 (0.49-0.93)	0.64 (0.52-0.78)	0.63 (0.32-1.23)	0.61 (0.42-0.89)	0.61 (0.37-1.00)	0.49 (0.21-1.08)	0.48 (0.29-0.79)
vs. BVS	2.52 (1.64-3.83)	1.16 (0.73-1.85)	1.09 (0.70-1.62)	-	0.80 (0.52-1.19)	0.72 (0.45-1.14)	0.69 (0.47-0.98)	0.68 (0.32-1.41)	0.67 (0.40-1.08)	0.66 (0.36-1.18)	0.53 (0.21-1.25)	0.52 (0.28-0.93)
vs. SES	3.15 (2.66-3.80)	1.46 (1.14-1.90)	1.36 (1.15-1.60)	1.25 (0.84-1.93)	-	0.90 (0.67-1.24)	0.86 (0.71-1.06)	0.85 (0.44-1.67)	0.83 (0.58-1.20)	0.82 (0.50-1.36)	0.66 (0.29-1.47)	0.65 (0.39-1.08)
vs. BP-BES	3.48 (2.53-4.89)	1.61 (1.10-2.41)	1.51 (1.08-2.05)	1.38 (0.88-2.21)	1.11 (0.81-1.49)	-	0.95 (0.72-1.27)	0.94 (0.48-1.86)	0.92 (0.63-1.34)	0.91 (0.57-1.47)	0.74 (0.31-1.68)	0.72 (0.42-1.23)
vs. CoCr-EES	3.65 (2.93-4.65)	1.68 (1.25-2.32)	1.57 (1.27-1.93)	1.45 (1.02-2.13)	1.16 (0.95-1.40)	1.05 (0.79-1.39)	-	0.99 (0.52-1.88)	0.96 (0.69-1.34)	0.96 (0.60-1.53)	0.77 (0.33-1.69)	0.75 (0.47-1.22)
vs. Dual DES	3.69 (1.90-7.36)	1.71 (0.86-3.51)	1.59 (0.81-3.11)	1.47 (0.71-3.10)	1.18 (0.60-2.29)	1.06 (0.54-2.07)	1.01 (0.53-1.94)	-	0.98 (0.55-1.73)	0.97 (0.44-2.16)	0.79 (0.29-2.05)	0.77 (0.36-1.62)
vs. R-ZES	3.79 (2.60-5.66)	1.75 (1.14-2.75)	1.63 (1.12-2.36)	1.50 (0.93-2.51)	1.20 (0.83-1.72)	1.09 (0.75-1.59)	1.04 (0.75-1.45)	1.02 (0.58-1.80)	-	0.99 (0.58-1.74)	0.80 (0.35-1.80)	0.78 (0.48-1.29)
vs. H-SES	3.82 (2.31-6.43)	1.76 (1.03-3.13)	1.65 (1.00-2.71)	1.52 (0.84-2.78)	1.22 (0.74-1.99)	1.10 (0.68-1.75)	1.05 (0.65-1.67)	1.03 (0.46-2.26)	1.01 (0.58-1.74)	-	0.81 (0.32-2.00)	0.79 (0.41-1.52)
vs. BP-EES	4.73 (2.10-11.2)	2.20 (0.96-5.32)	2.04 (0.93-4.76)	1.88 (0.80-4.79)	1.51 (0.68-3.49)	1.35 (0.59-3.25)	1.29 (0.59-2.99)	1.27 (0.49-3.46)	1.25 (0.56-2.86)	1.24 (0.50-3.15)	-	0.98 (0.52-1.91)
vs. PtCr-EES	4.82 (2.92-8.19)	2.23 (1.29-3.94)	2.08 (1.27-3.45)	1.93 (1.07-3.55)	1.53 (0.93-2.56)	1.38 (0.81-2.38)	1.33 (0.82-2.14)	1.31 (0.62-2.75)	1.28 (0.77-2.08)	1.26 (0.66-2.44)	1.02 (0.52-1.92)	-

Odds ratios and 95% credible intervals are presented. Comparisons with significantly lower risk are highlighted with red, and those with higher risk with blue.

BMS: bare metal stents; BP-BES: biodegradable polymer biolimus-eluting stents; BP-EES: biodegradable polymer everolimus-eluting stents; BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents; dual DES: sirolimus- and probucol-eluting stents; E-ZES: Endeavor zotarolimus-eluting stents; H-SES: Orsiro hybrid sirolimus-eluting stents; PES: paclitaxel-eluting stents; PtCr-EES: platinum-chromium everolimus-eluting stents; R-ZES: Resolute zotarolimus-eluting stents; SES: sirolimus-eluting stents

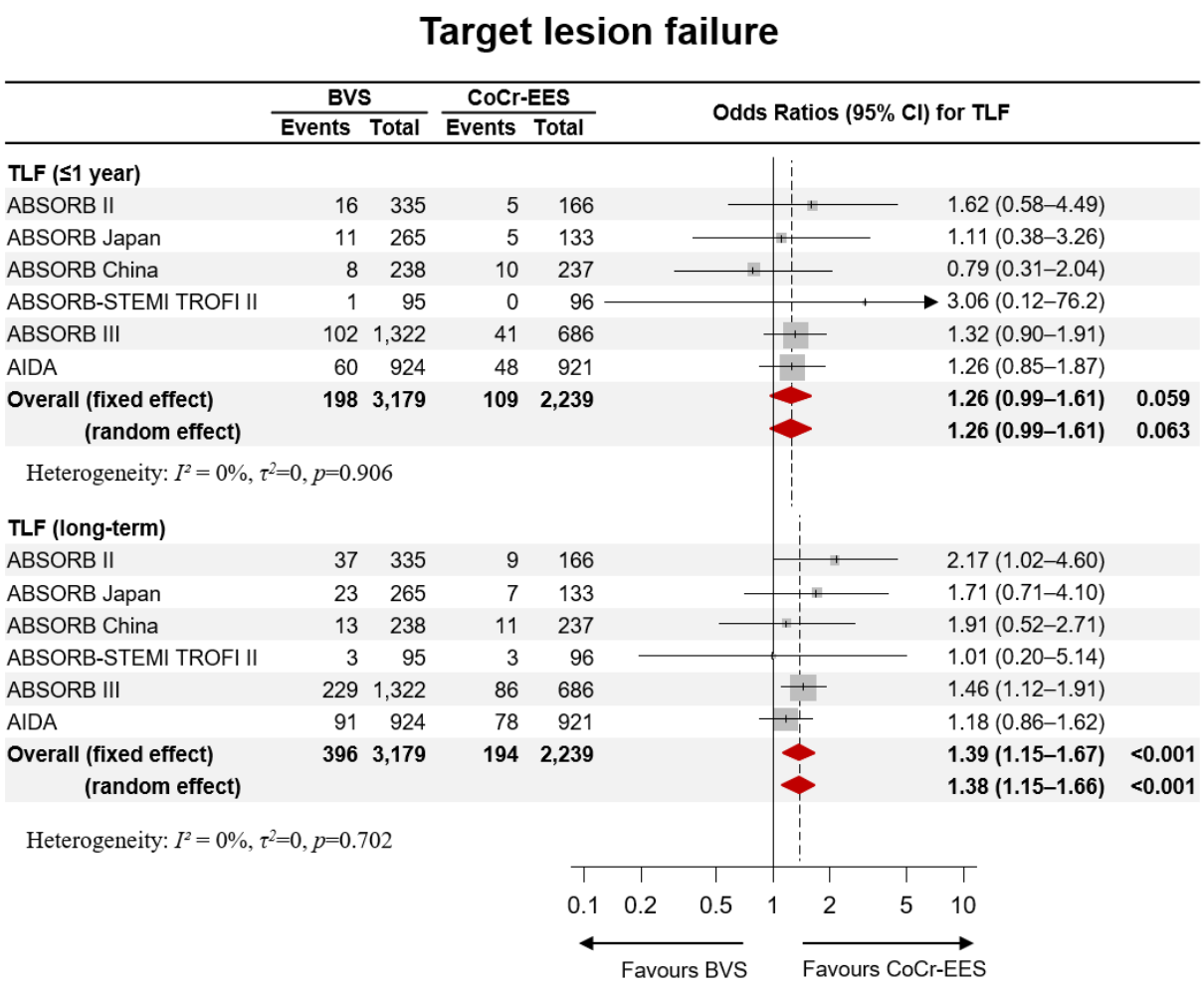
Supplementary Figure 2. Frequentist meta-analysis for definite stent thrombosis (ST).



The squares and the horizontal lines indicate the ORs and the 95% confidence intervals (CI) for each included trial. The size of each square is proportional to the statistical weight of a trial in the meta-analysis. A diamond indicates the effect estimate derived from the meta-analysis, with the centre indicating the point estimate and the left and the right ends the 95% CI.

BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents

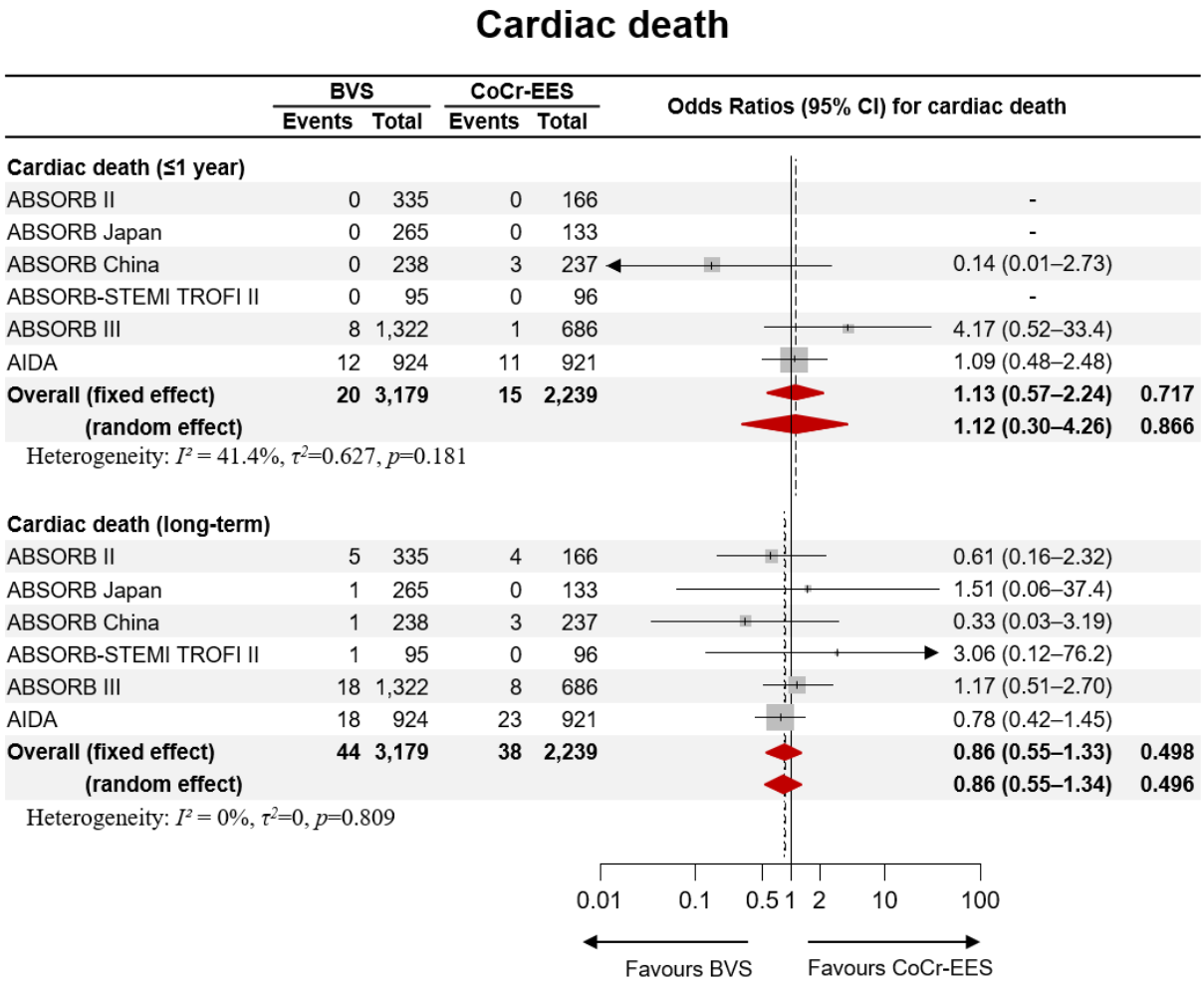
Supplementary Figure 3. Frequentist meta-analysis for target lesion failure (TLF).



The squares and the horizontal lines indicate the ORs and the 95% confidence intervals (CI) for each included trial. The size of each square is proportional to the statistical weight of a trial in the meta-analysis. A diamond indicates the effect estimate derived from the meta-analysis, with the centre indicating the point estimate and the left and the right ends the 95% CI.

BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents

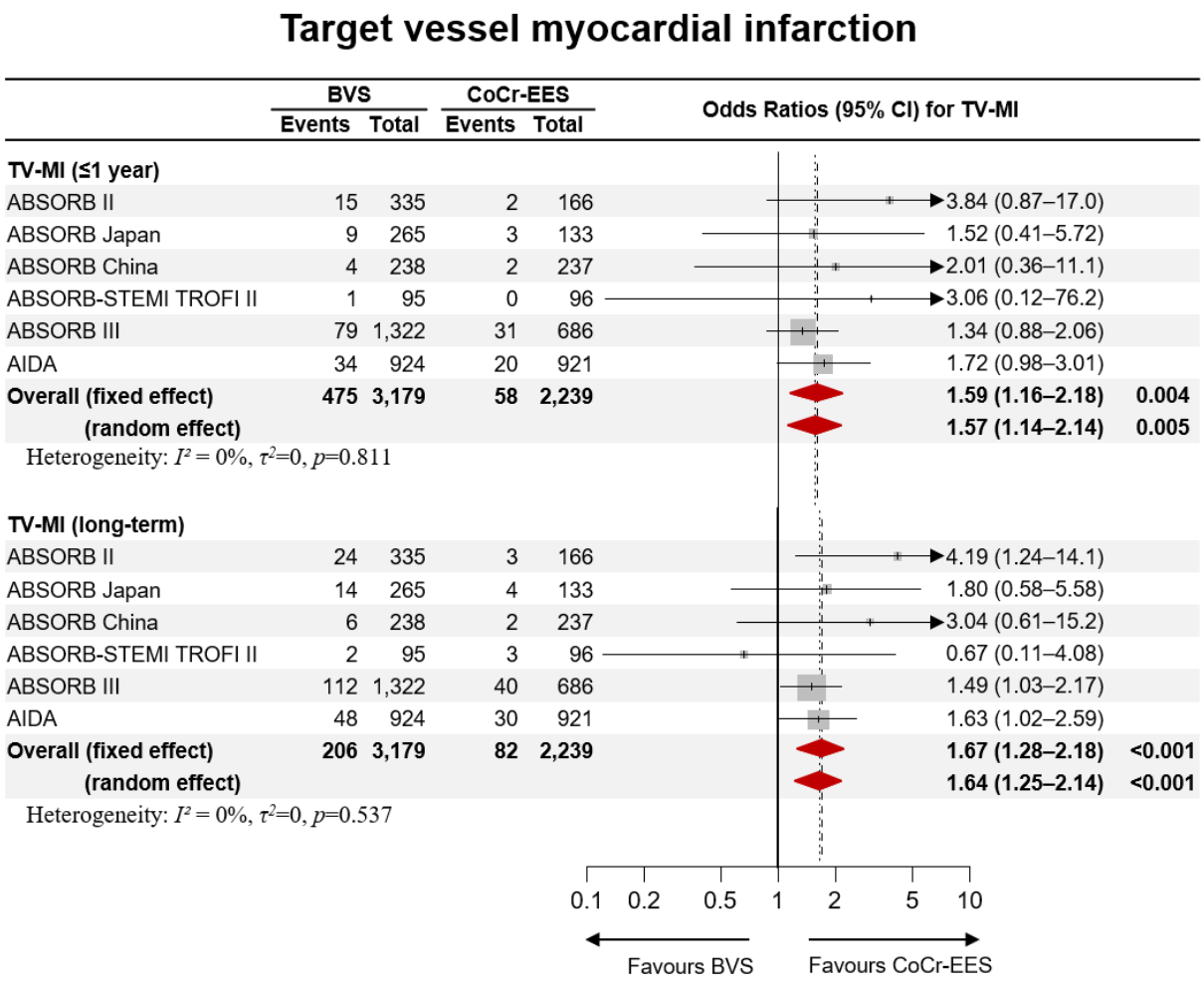
Supplementary Figure 4. Frequentist meta-analysis for cardiac death.



The squares and the horizontal lines indicate the ORs and the 95% confidence intervals (CI) for each included trial. The size of each square is proportional to the statistical weight of a trial in the meta-analysis. A diamond indicates the effect estimate derived from the meta-analysis, with the centre indicating the point estimate and the left and the right ends the 95% CI.

BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents

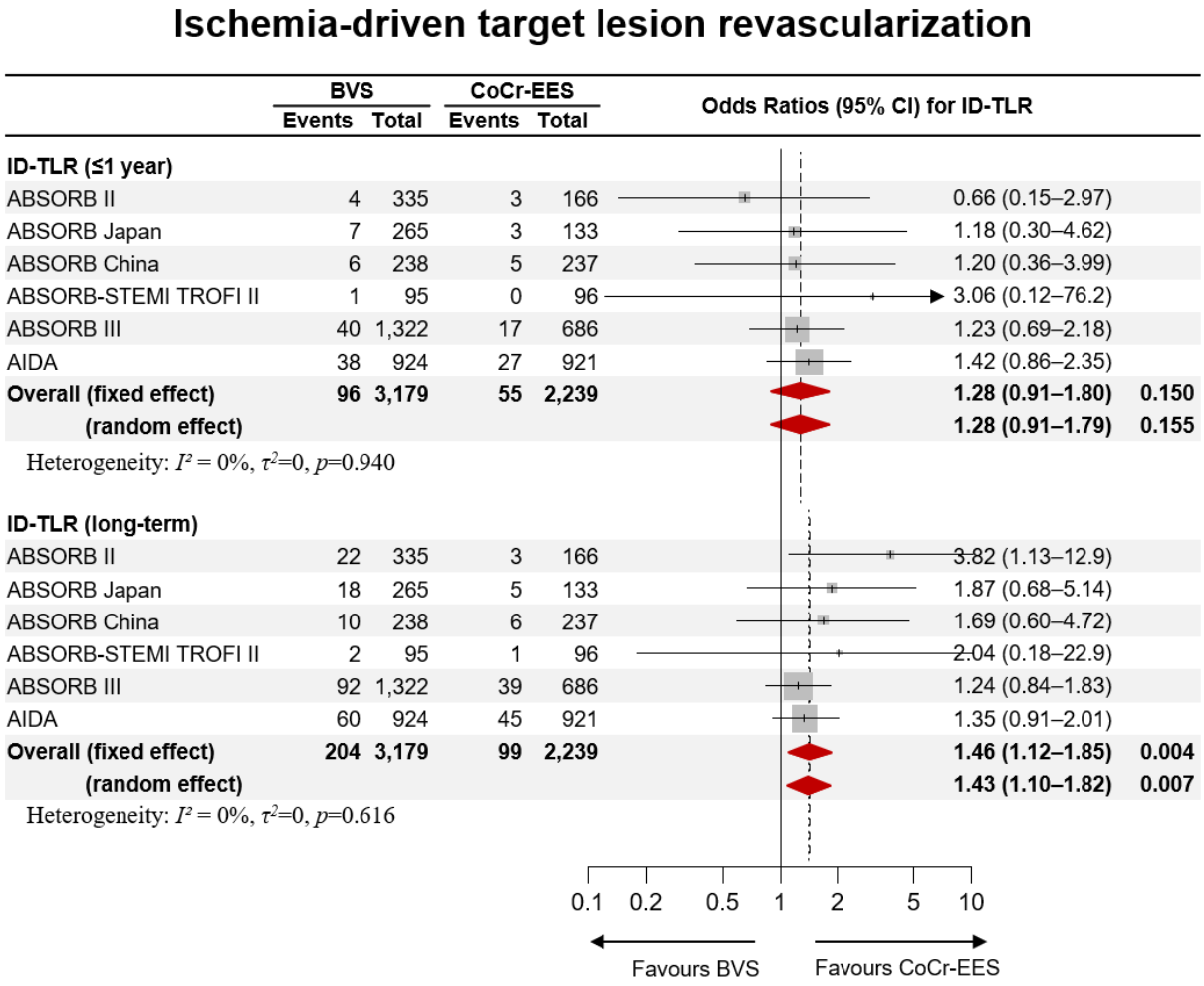
Supplementary Figure 5. Frequentist meta-analysis for target vessel-myocardial infarction (TV-MI).



The squares and the horizontal lines indicate the ORs and the 95% confidence intervals (CI) for each included trial. The size of each square is proportional to the statistical weight of a trial in the meta-analysis. A diamond indicates the effect estimate derived from the meta-analysis, with the centre indicating the point estimate and the left and the right ends the 95% CI.

BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents

Supplementary Figure 6. Frequentist meta-analysis for ischaemia-driven or clinically driven target lesion revascularisation (TLR).



The squares and the horizontal lines indicate the ORs and the 95% confidence intervals (CI) for each included trial. The size of each square is proportional to the statistical weight of a trial in the meta-analysis. A diamond indicates the effect estimate derived from the meta-analysis, with the centre indicating the point estimate and the left and the right ends the 95% CI.

BVS: bioresorbable vascular scaffolds; CoCr-EES: cobalt-chromium everolimus-eluting stents

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