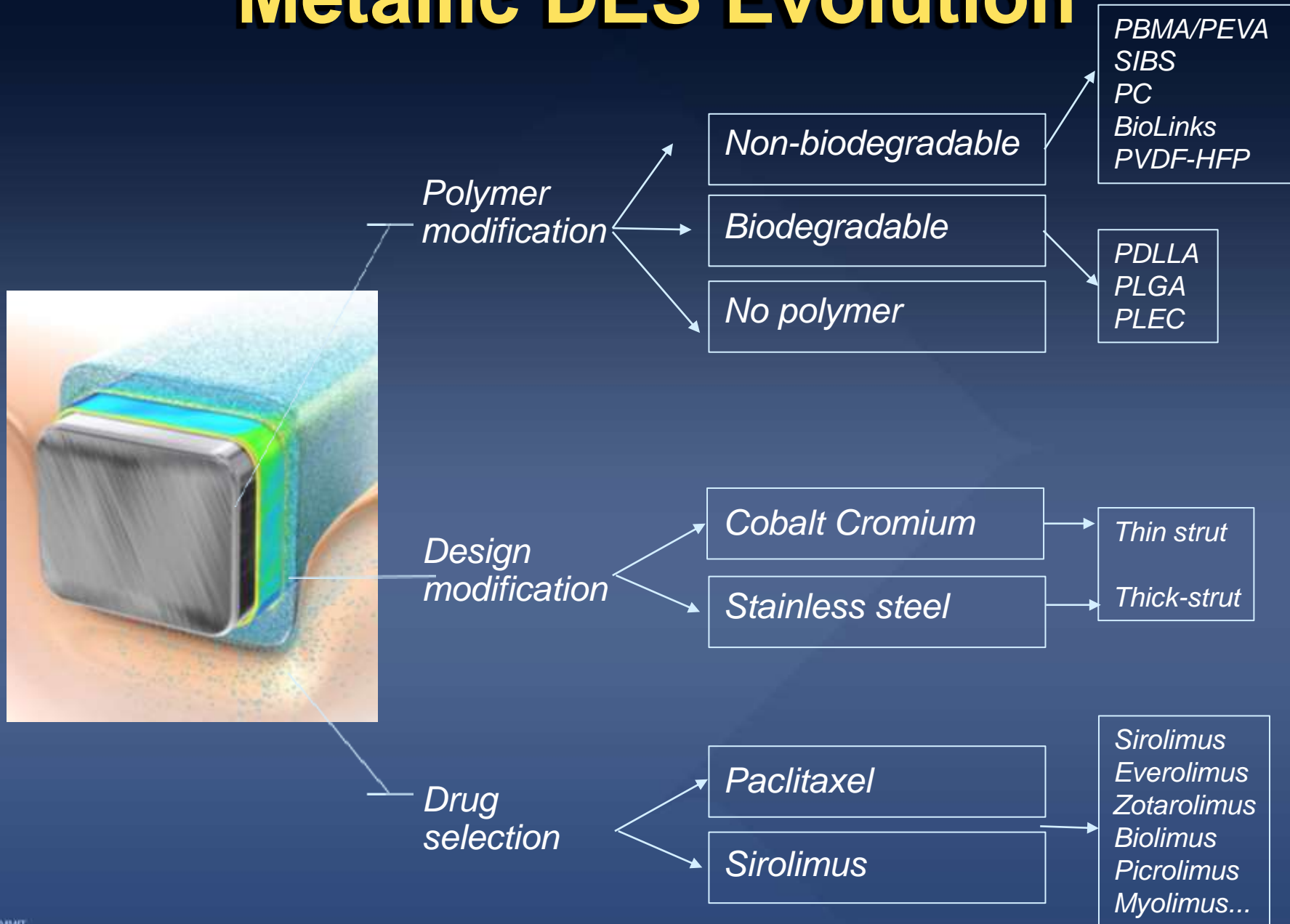


All Contemporary DES Comparison: Data from Real-World Registry (IRIS-DES Registry)

Duk-Woo Park, MD

**Department of Cardiology, Ulsan College of Medicine,
Asan Medical Center**

Metallic DES Evolution



Evolution of DES Technology

First Gen

Durable Polymer Stents

Cypher



TAXUS Express



TAXUS
Liberte



Strut Thickness

140 μm

132 μm

96 μm

Coat Thickness

7 μm / side

16 μm /side

14 μm /side

Bioabsorbable Polymer Stents

Biomatrix



Nobori



Strut Thickness

120 μm

125 μm

Coat Thickness

10 μm

20 μm

Second Gen

Resolute
Integrity



Xience
Xpedition



Promus
PREMIER



89 μm

81 μm

81 μm

6 μm / side

8 μm / side

8 μm / side

Firehawk



Synergy



Ultimaster



86 μm

74 μm

80 μm

10 μm

4 μm

14 μm

First Generation Future Technologies

Fully Bioresorbable Stents

BVS



ELIXIR DESolve



DREAMS II



Strut Thickness

150 μm

150 μm

150 μm

Coat Thickness

3 μm / side

<3 μm / side

8 μm / side

Polymer Free Stents

BIOFREEDOM



Drug Filled
Stent



112

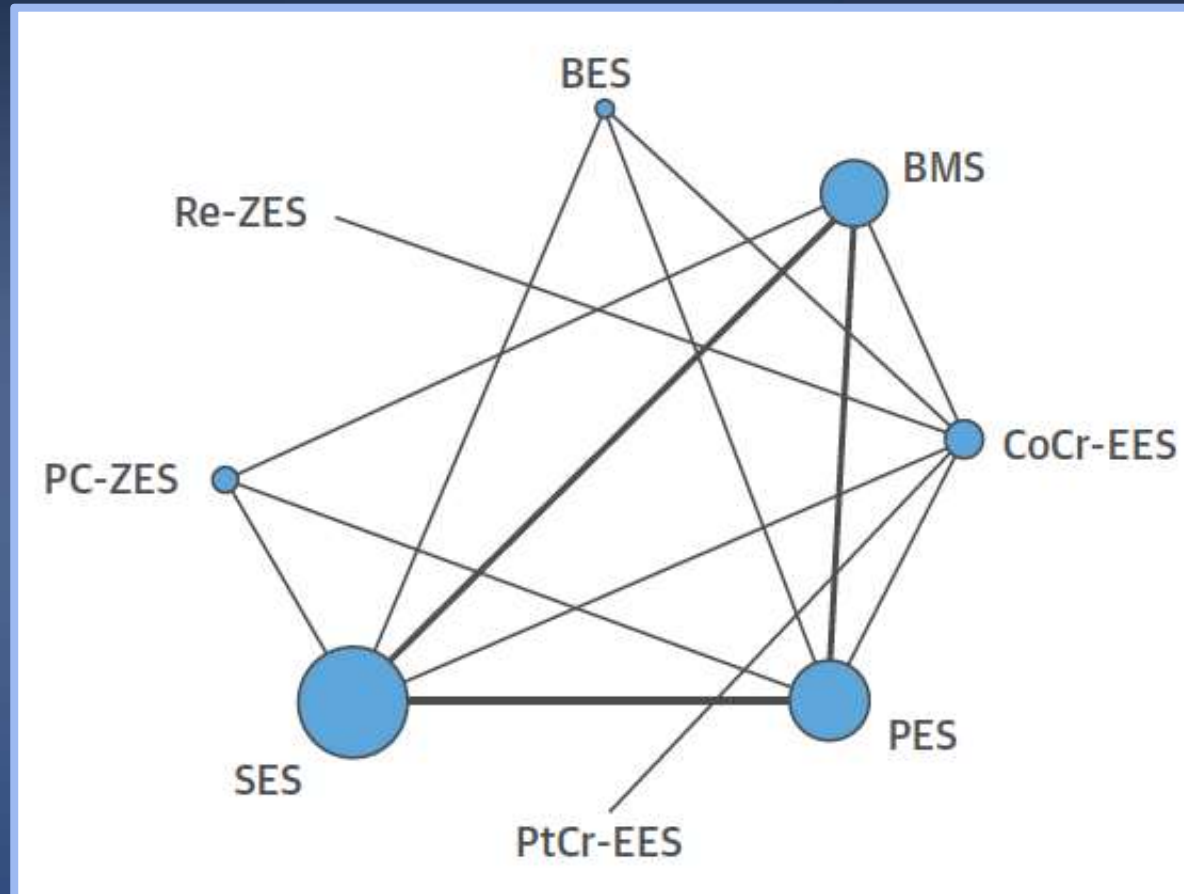
86

NA

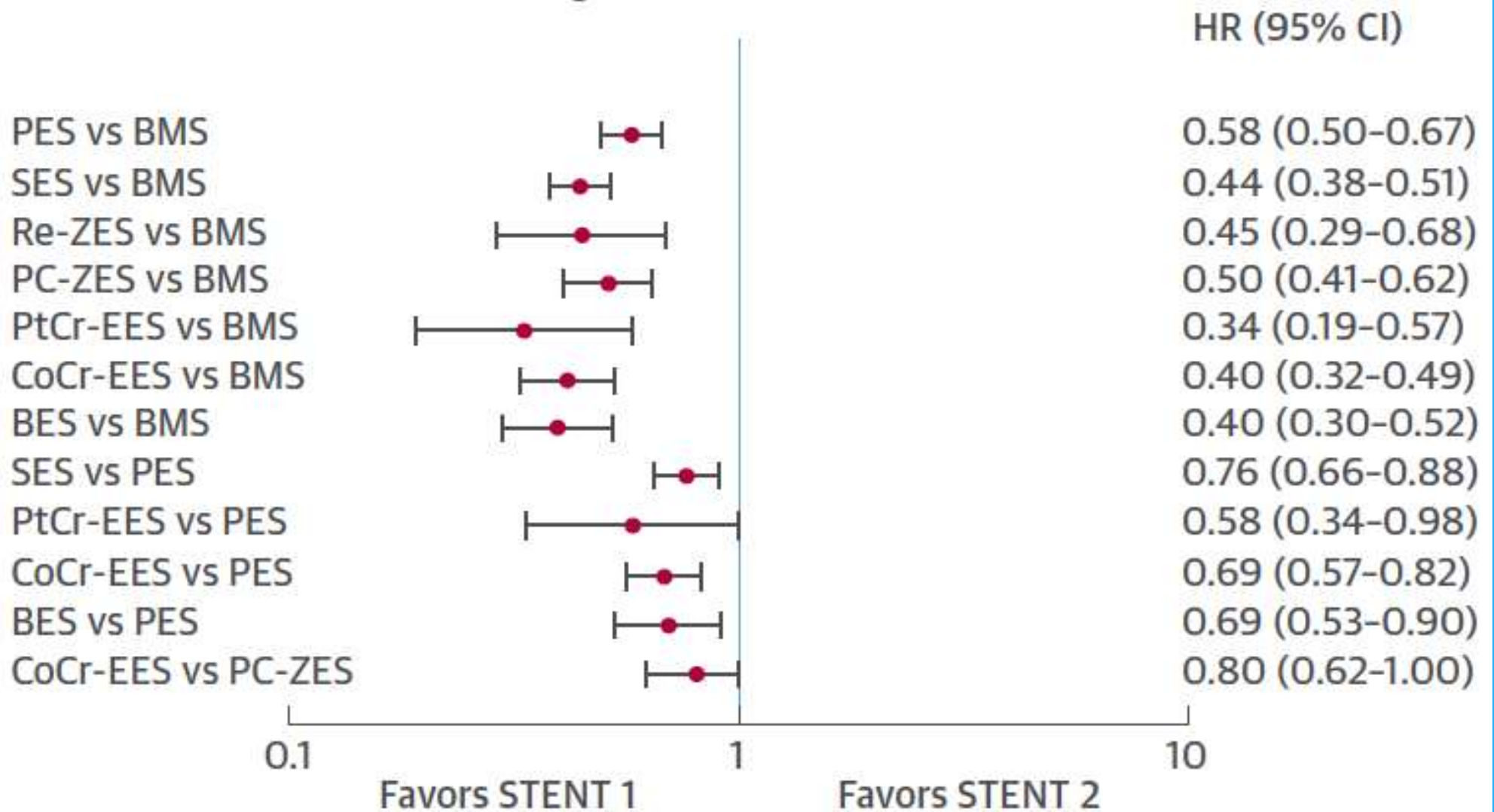
NA

Updated Network Meta-Analysis including RCT with at least 3 year FU

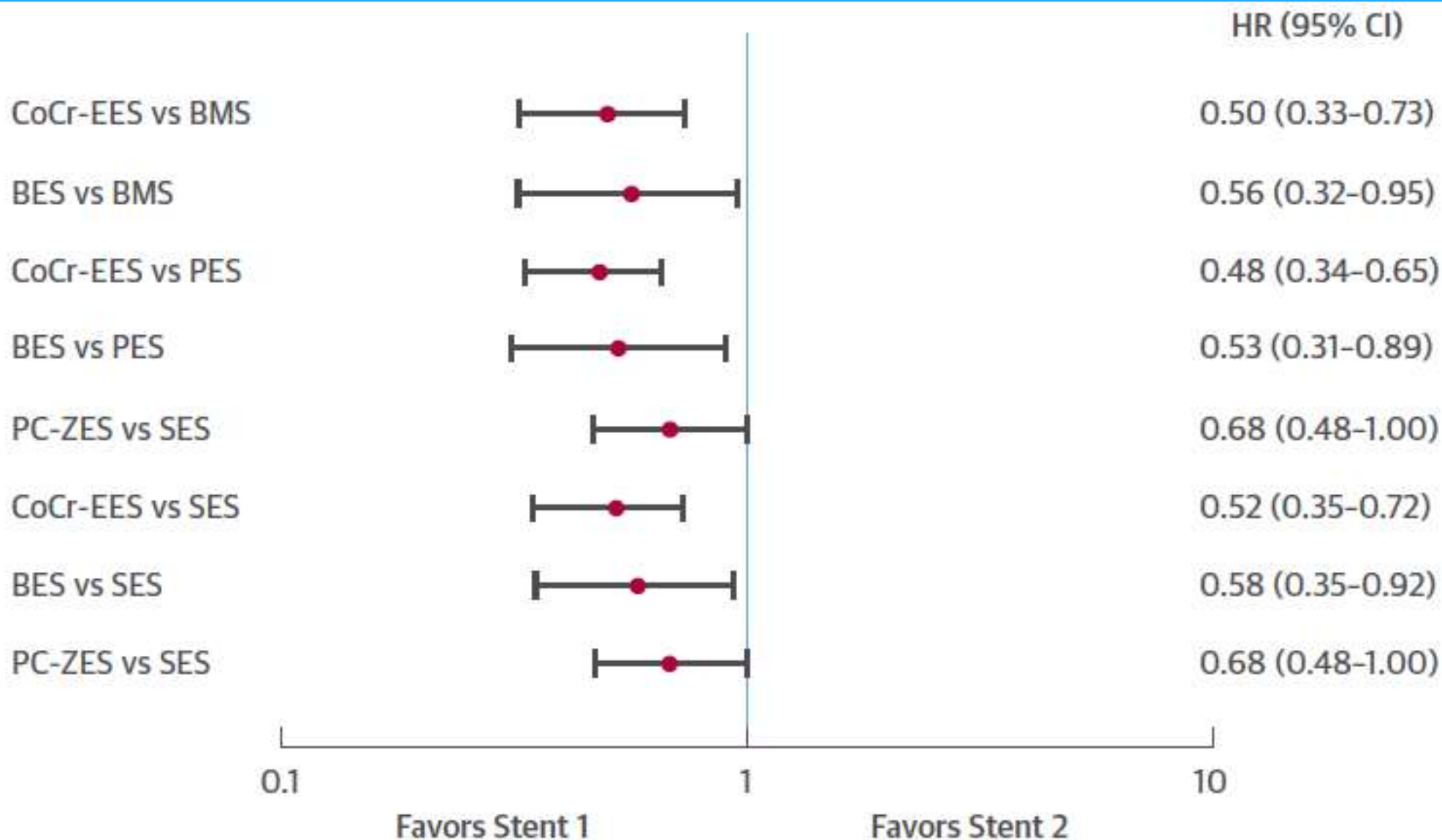
51 RCTs; 52,158 patients (median 3.8 yr FU)



Efficacy; TVR



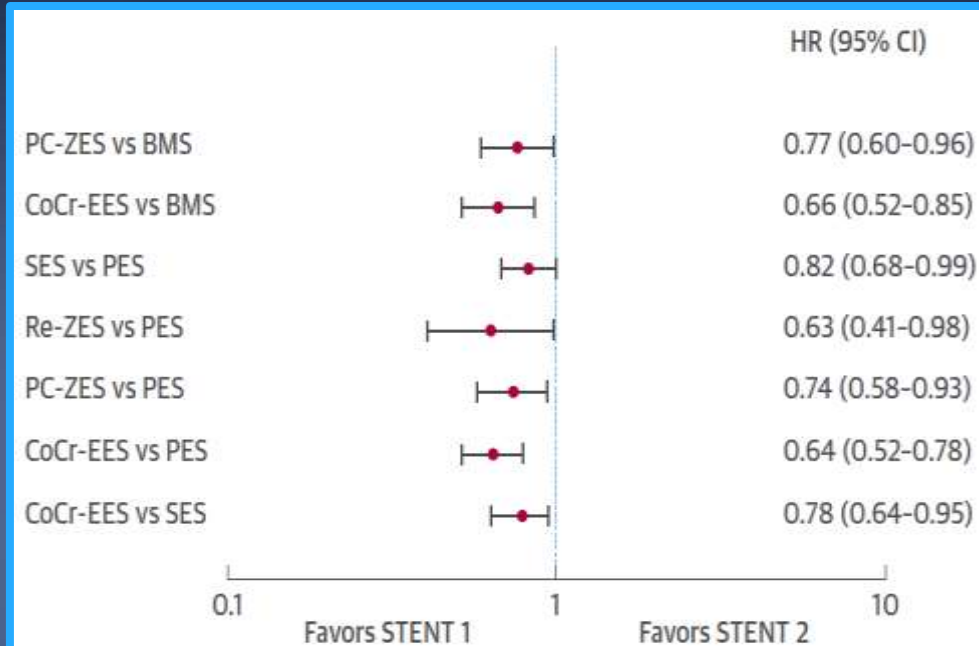
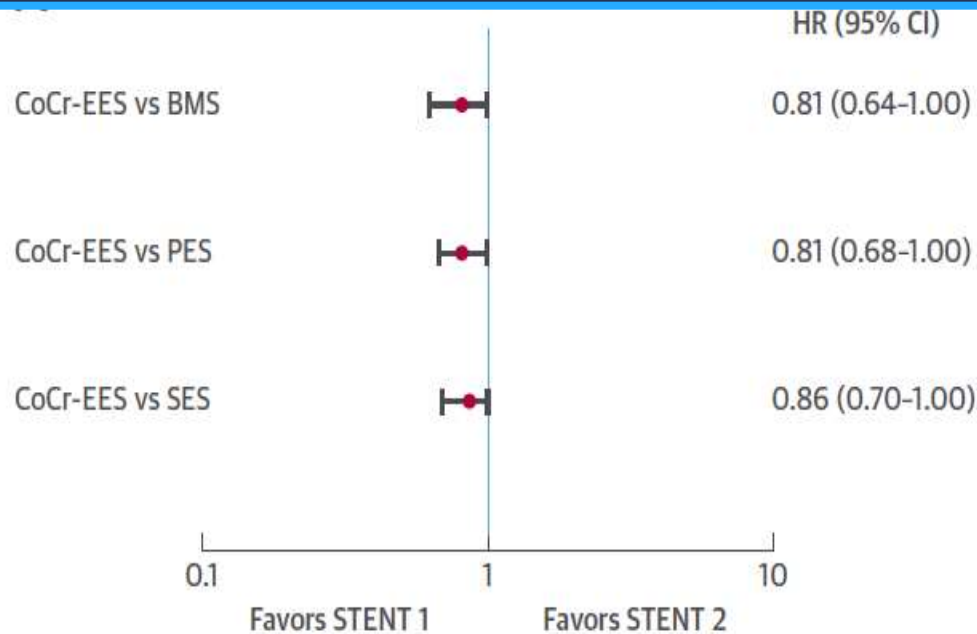
Safety; Definite or Probable ST



Hard Clinical Endpoints

Death

MI



Contemporary DES in RCT; Enhanced Safety and Efficacy Outcomes

- Second-generation DES showed better safety outcomes (ST, death, or MI) than first-generation DES or BMS during long-term FU.
- By a meta-analysis of 51 comparative trials, second-generation DES showed better efficacy outcomes than either first-generation DES or BMS after a median 4-year FU.

**Are There Any MAJOR Differences in
Clinical Outcomes Between the Most
Widely Used Contemporary Metallic DES?**

Difference in RCT and Registry?

IRIS DES registry

- **Multicenter, Prospective, Real world observational study**
- **To compare the safety and efficacy of the second- or newer-generation DES and the first-generation DES in everyday clinical practice**
- **ClinicalTrial.gov; NCT01186133**

IRIS DES registry

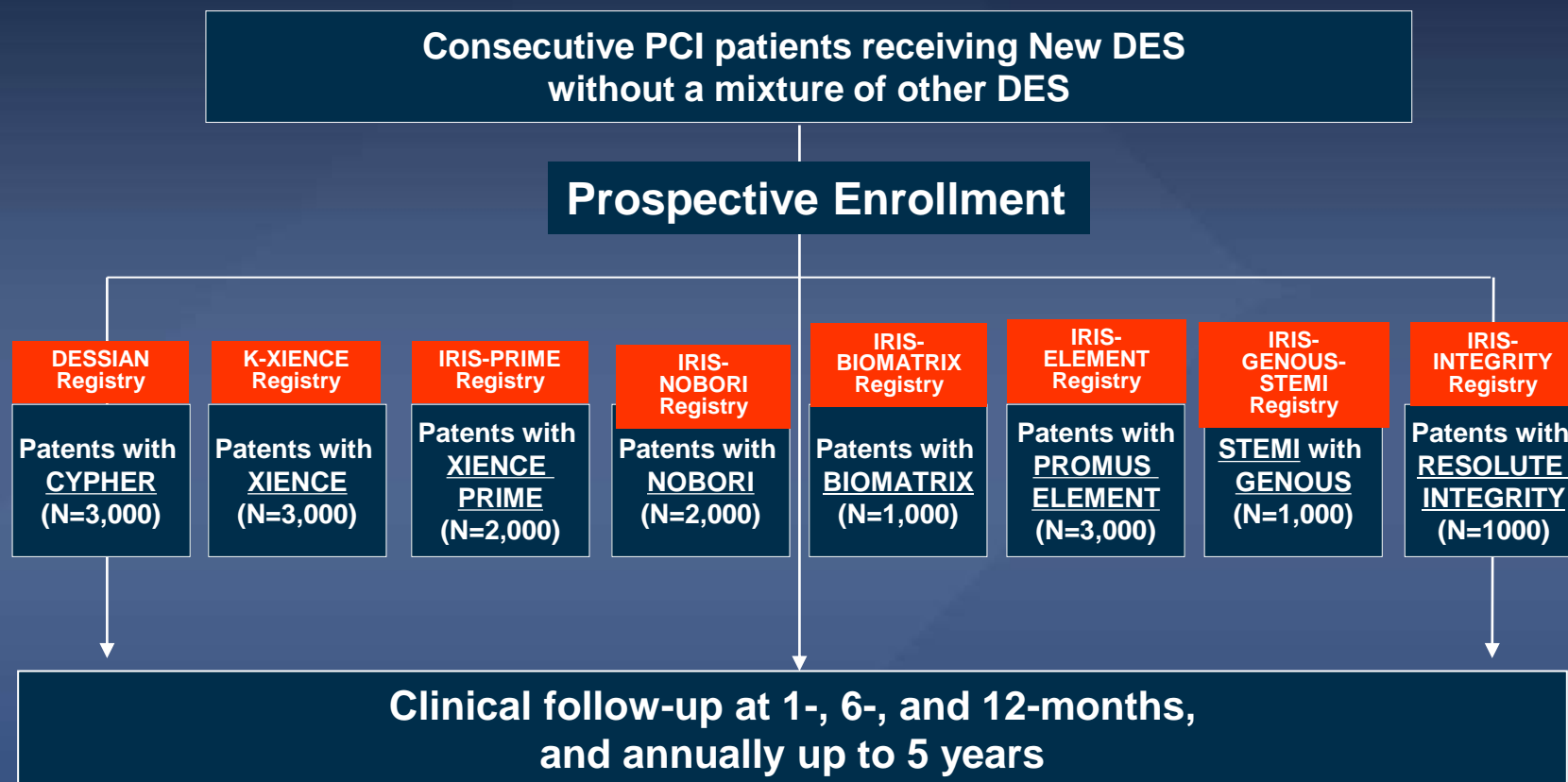
Inclusion Criteria

- Coronary disease amenable to percutaneous coronary intervention (PCI)

Exclusion Criteria

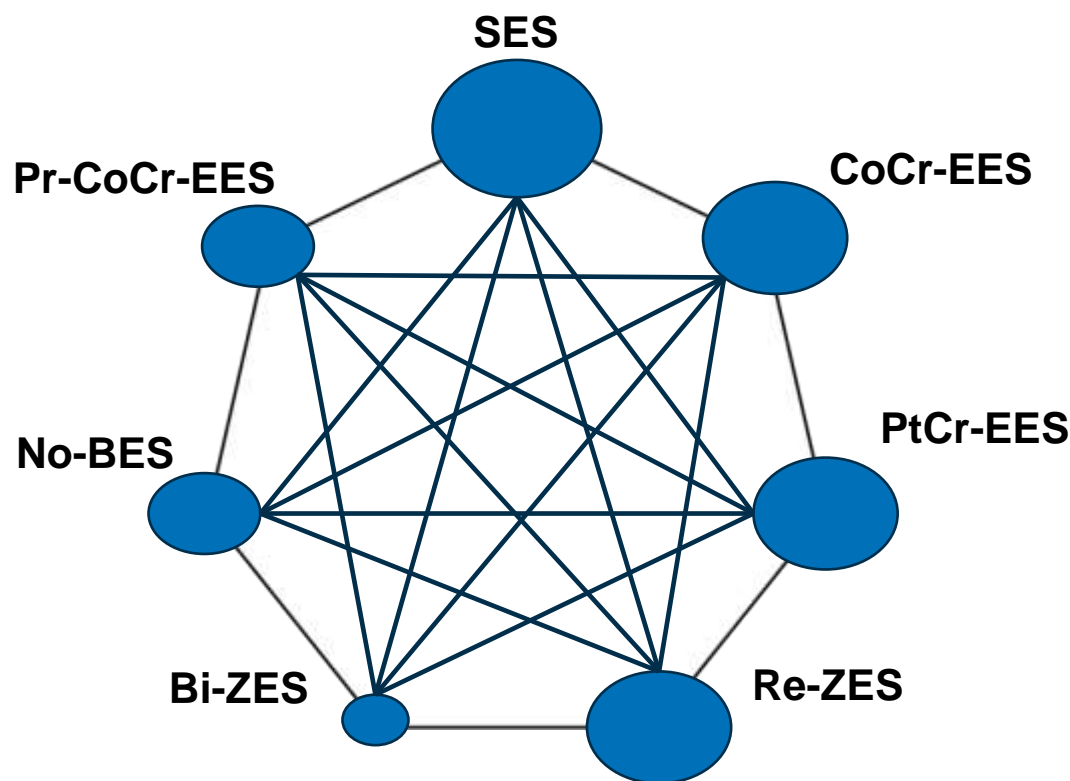
- Patients with a mixture of several DES
- Life expectancy less than 1 year

Evaluation of Effectiveness and Safety of the First, Second, and Newer Drug-Eluting Stents in Routine Clinical Practice; **IRIS-DES Registry**



Updated Meta-Analysis of IRIS-DES Registry

7 registry; 17,196 patients, median 3.3 years



Clinical Characteristics

Characteristics	SES (n=3570)	CoCr-EES (n=3053)	PtCr-EES (n=2985)	Re-ZES (n=2922)	Bi-BES (n=789)	No-BES (n=1907)	Pr-CoCr-EE S (n=1970)
Age (years)	63.6 ± 10.8	63.5 ± 10.8	63.8 ± 11.0	64.0 ± 10.9	64.0 ± 10.5	64.0 ± 10.8	63.9 ± 10.7
Men	66.3%	67.5%	70.6%	72.3%	68.8%	68.8%	72.0%
BMI (kg/m ²)	24.7 ± 3.1	24.7 ± 3.2	24.7 ± 3.3	24.8 ± 3.2	24.7 ± 3.1	24.6 ± 3.2	24.6 ± 3.1
Diabetes mellitus	36.4%	33.4%	33.8%	32.6%	29.2%	29.1%	35.1%
Hypertension	62.6%	62.5%	61.2%	61.1%	58.6%	59.3%	62.8%
Hyperlipidemia	40.2%	37.6%	36.4%	47.5%	37.6%	32.6%	36.3%
Current smoker	27.1%	28.9%	29.2%	28.8%	28.1%	30.2%	31.3%

Clinical Characteristics

Characteristics	SES (n=3570)	CoCr-EES (n=3053)	PtCr-EES (n=2985)	Re-ZES (n=2922)	Bi-BES (n=789)	No-BES (n=1907)	Pr-CoCr-EE S (n=1970)
Family history of CAD	4.8%	3.6%	6.7%	8.0%	6.7%	4.7%	6.4%
Previous MI	7.7%	5.2%	5.0%	5.2%	4.9%	4.2%	4.6%
Previous CHF	2.4%	2.1%	2.7%	2.1%	3.0%	1.2%	2.6%
Previous PCI	19.1%	14.9%	10.8%	11.9%	7.0%	8.5%	9.4%
Previous CABG	2.4%	2.0%	1.2%	1.8%	1.3%	2.1%	1.9%
Renal failure	4.2%	3.3%	3.1%	3.4%	3.0%	2.3%	3.8%
History of stroke	7.6%	8.2%	7.3%	7.2%	7.0%	6.3%	6.7%

Clinical Characteristics

Characteristics	SES (n=3570)	CoCr-EES (n=3053)	PtCr-EES (n=2985)	Re-ZES (n=2922)	Bi-BES (n=789)	No-BES (n=1907)	Pr-CoCr-EES (n=1970)
PVD	1.1%	1.2%	2.0%	3.7%	1.9%	1.0%	2.5%
Chronic lung disease	2.5%	2.9%	2.0%	2.7%	2.5%	2.4%	1.8%
Ejection fraction (%)	59.1 ± 10.7	59.5 ± 10.9	58.8 ± 10.2	58.8 ± 10.2	59.2 ± 10.2	58.4 ± 9.8	57.9 ± 11.1
Clinical indication for PCI							
Stable angina	45.3%	41.6%	38.2%	41.0%	37.3%	42.5%	40.3%
Unstable angina	32.0%	34.3%	33.8%	32.4%	34.9%	27.8%	31.1%
NSTEMI	12.2%	10.9%	16.1%	14.5%	15.3%	14.9%	15.1%
STEMI	10.4%	13.1%	11.9%	12.1%	12.5%	14.8%	13.6%

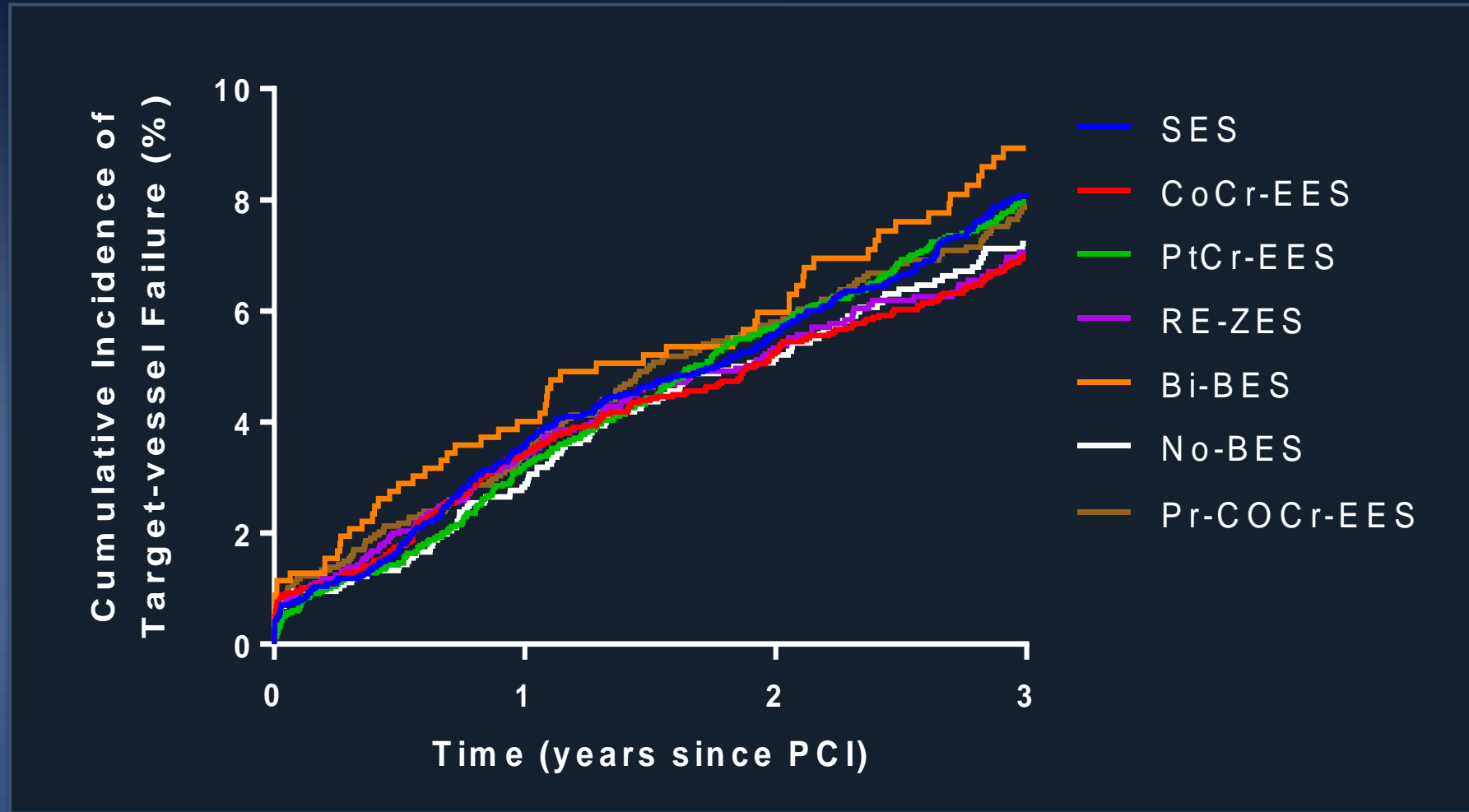
Lesion characteristics

Characteristics	SES (n=3570)	CoCr-EES (n=3053)	PtCr-EES (n=2985)	Re-ZES (n=2922)	Bi-BES (n=789)	No-BES (n=1907)	Pr-CoCr-EES (n=1970)
Treated lesions							
1	64.9%	67.2%	69.9%	72.7%	79.2%	78.0%	69.4%
2	26.4%	25.1%	23.4%	21.3%	16.9%	18.6%	23.9%
3	7.2%	6.3%	5.4%	4.7%	3.5%	2.6%	5.7%
>3	1.5%	1.3%	1.2%	1.2%	0.4%	0.8%	0.9%
Location of treated lesion							
LM	3.3%	6.7%	3.8%	5.2%	1.6%	1.1%	2.3%
LAD	49.7%	47.2%	42.4%	40.9%	46.6%	45.6%	41.6%
LCX	20.2%	19.2%	24.6%	23.1%	23.0%	24.1%	24.4%
RCA	26.6%	26.7%	29.1%	30.5%	28.8%	29.2%	31.5%
Graft	0.2%	0.2%	0.1%	0.3%	0.0%	0.0%	0.2%

Procedural Characteristics

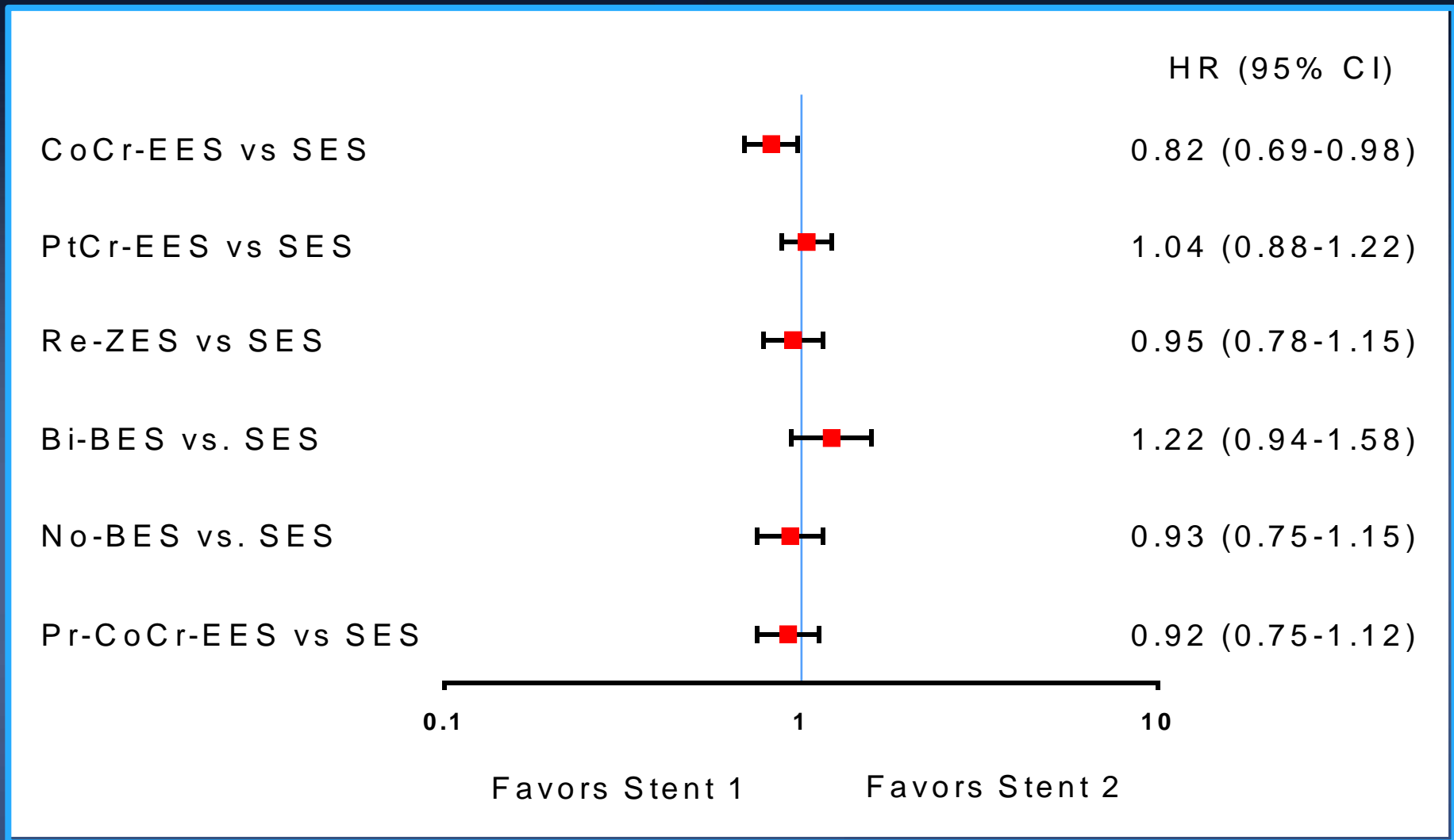
Characteristics	SES (n=5136)	CoCr-EES (n=4158)	PtCr-EES (n=5375)	Re-ZES (n=5476)	Bi-BES (n=1356)	No-BES (n=3206)	Pr-CoCr-EES (n=3647)
Lesion type							
De novo	94.6%	95.6%	97.5%	97.5%	98.7%	99.0%	97.8%
Restenotic	5.4%	4.4%	2.5%	2.5%	1.3%	1.0%	2.2%
Number of Stents	1.2 ± 0.6	1.3 ± 0.6	1.2 ± 0.5	1.2 ± 0.5	1.1 ± 0.4	1.1 ± 0.4	1.2 ± 0.5
Stent length (mm)	32.1 ± 16.6	30.1 ± 17.8	28.0 ± 14.3	30.2 ± 15.5	24.4 ± 11.1	25.0 ± 11.3	31.4 ± 15.9
Stent diameter (mm)	3.1 ± 0.4	3.2 ± 0.4	3.2 ± 0.5	3.2 ± 0.5	3.2 ± 0.4	3.1 ± 0.4	3.1 ± 0.5
Use of IVUS	48.5%	51.3%	28.4%	36.9%	32.2%	21.0%	31.0%

K-M curves of Target-Vessel Failure (TVF) According to DES Type



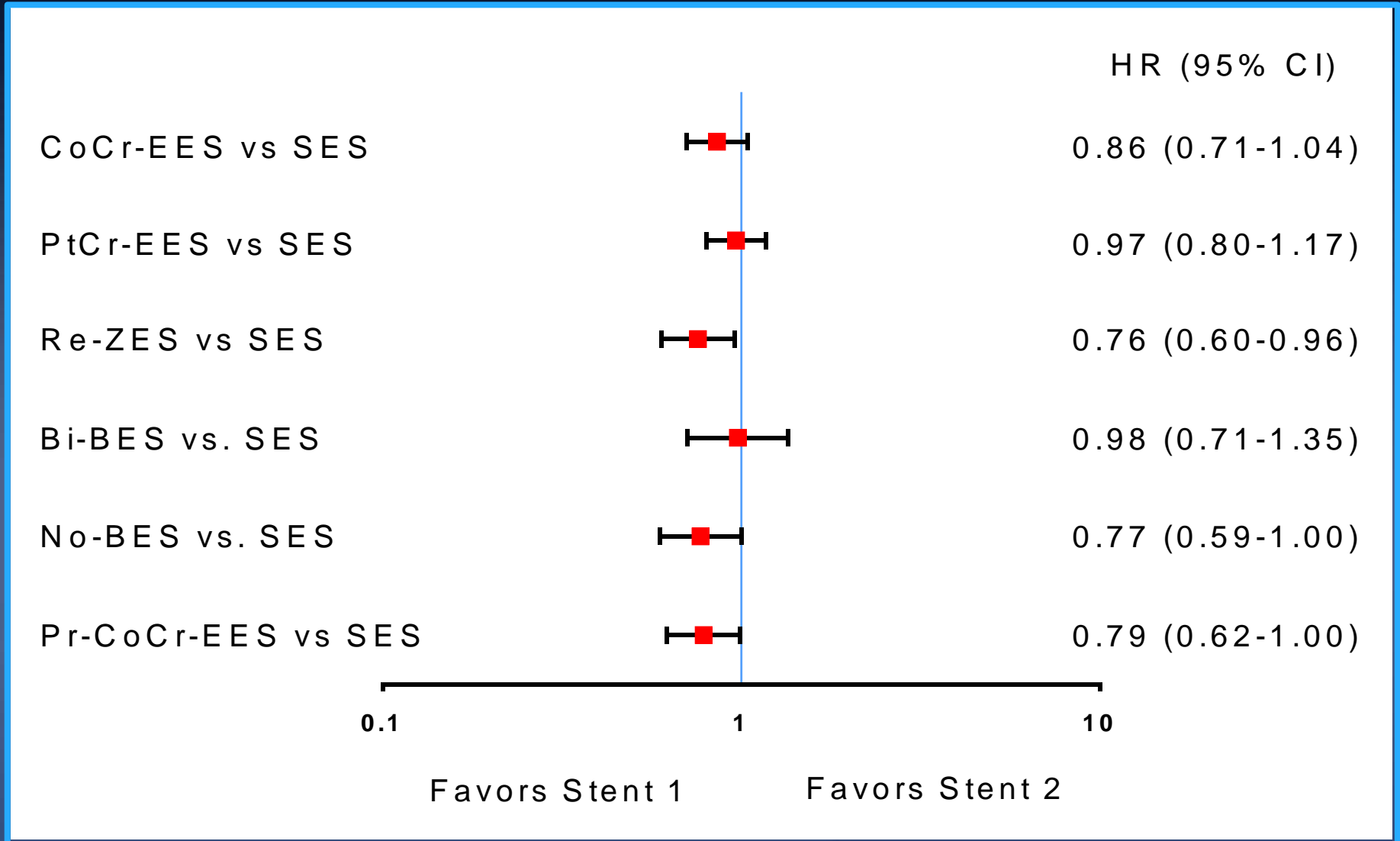
TVR: composite of cardiac death, target-vessel MI, clinical driven TVR

Adjusted HR: Target-Vessel failure

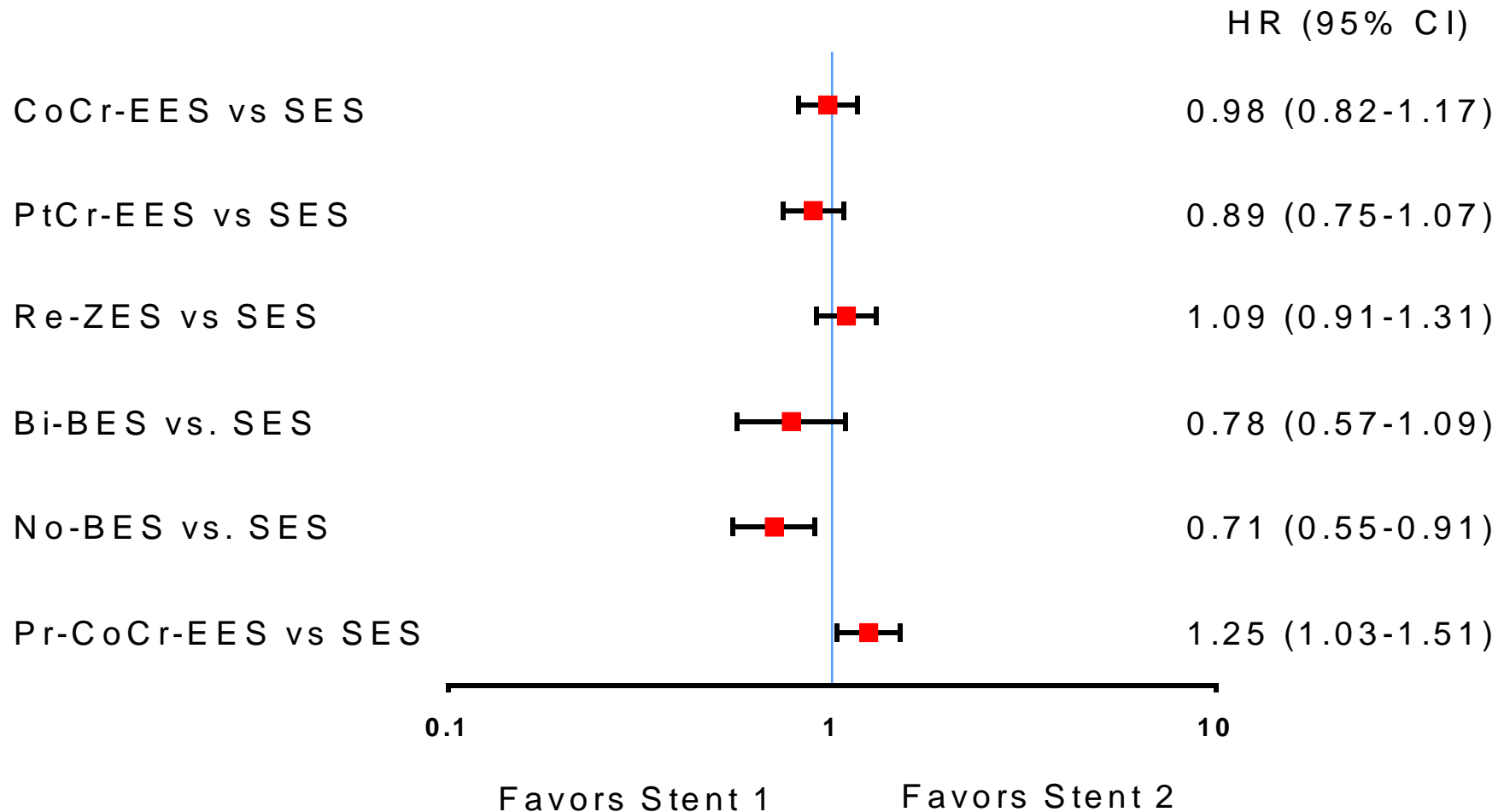


TVR: composite of cardiac death, target-vessel MI, clinical driven TVR

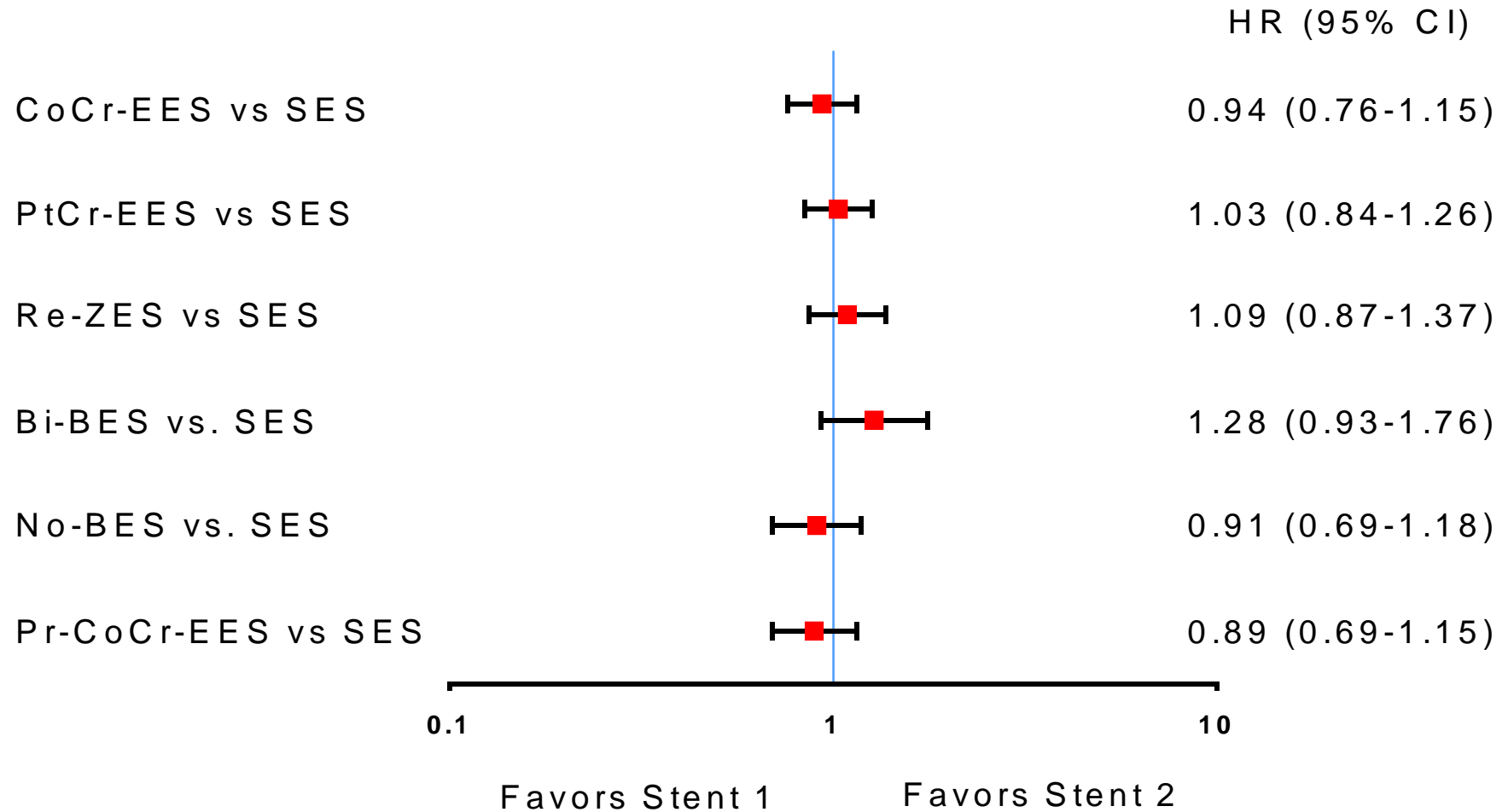
Adjusted HR: All-cause death



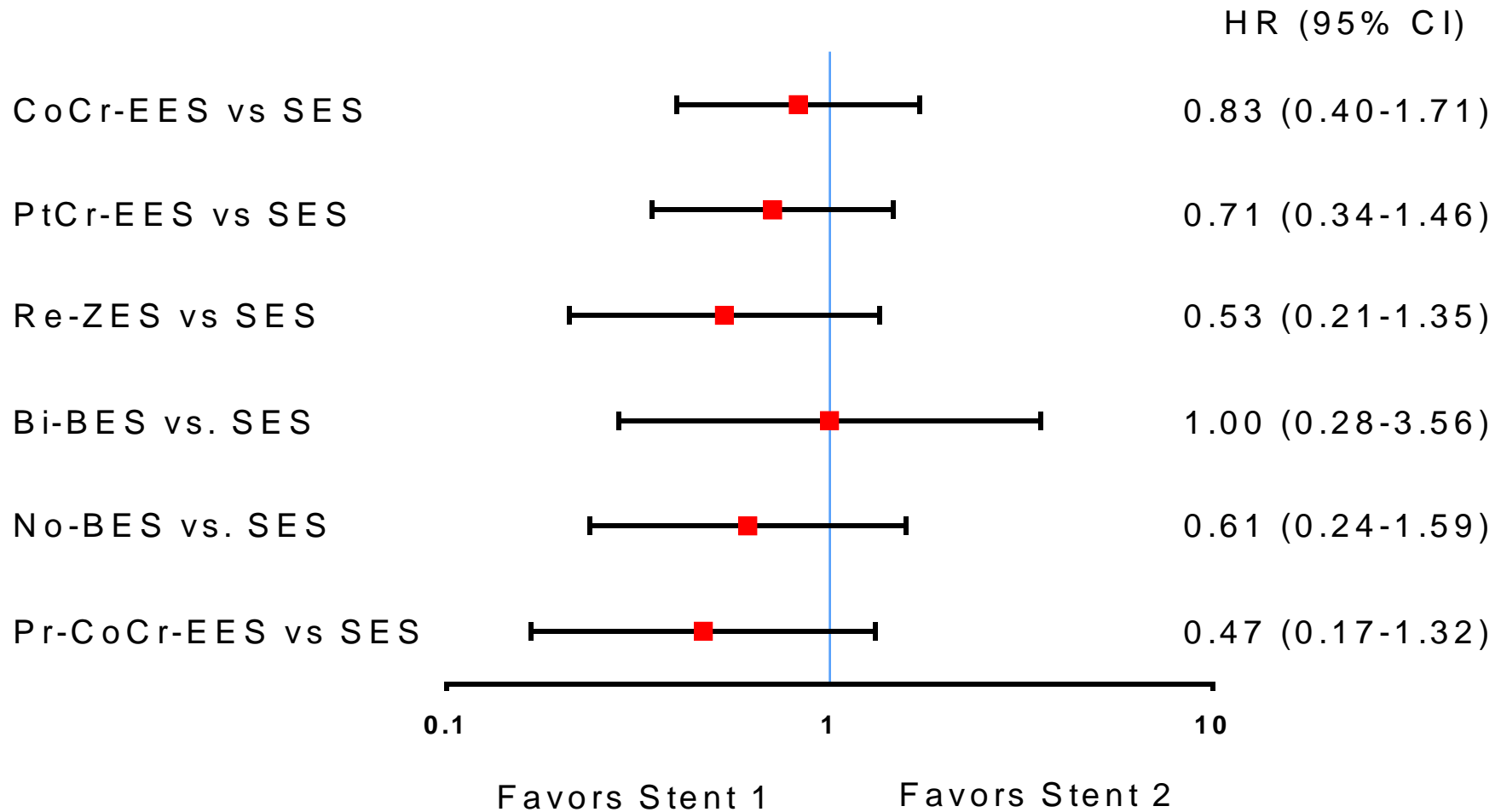
Adjusted HR: Myocardial infarction



Adjusted HR: TVR



Adjusted HR: Definite or Probable ST



Contemporary PCI with Second-Generation DES

- In contemporary DES era, there was no remarkable between-stent difference with respect to clinically relevant efficacy and safety outcomes
- We can choose any contemporary DES on the basis of clinical and lesion subsets and combined with the physician's preference.

Contemporary PCI with Second-Generation DES

- We now have reached a matured milestone in PCI with contemporary DES.
- However, “When technology stops continued innovation”, “The Knowledge will also stops”