

# CABG vs. DES Implantation for Left Main or MVD

## A Meta-analysis of Individual Patient Data

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# CABG vs. PCI

## Before DES Era

Long-term mortality is similar after CABG and PCI in most patient with multivessel CAD. CABG may be a better option for patients with diabetes because of a lower mortality .

## DES Era

	Death/MI	Stroke	TVR
<b>PRECOMBAT</b>	No difference	No difference	<b>CABG</b>
<b>SYNTAX</b>	<b>CABG</b>	<b>PCI</b>	<b>CABG</b>
<b>FREEDOM</b>	<b>CABG</b>	<b>PCI</b>	<b>CABG</b>
<b>BEST</b>	No difference	No difference	<b>CABG</b>

Individual trials are not large enough to resolve the uncertainties on optimal treatment for these diseases.

# Why Individual Patient Data Analysis?

- Most RCTs have limited power to assess the clinical equipoise between CABG & PCI with DES regarding hard outcomes.
- Pooling of patient-level data from RCTs increases the **statistical power** and allows **time-to-event analysis**, and its separate effects among **specific subgroups**.

# Database Pooling

- We combined the database from the BEST (n=880, EES), PRECOMBAT (n=600, SES) and SYNTAX (n=1800, PES) trials.
- **Variables:**
  - Demographics (age, sex, body weight, height), revascularization strategies,
  - Clinical history (CKD, previous MI, previous stroke, PAD, previous PCI),
  - Risk factors (diabetes, hypercholesterolemia, hypertension, smoking),
  - Angiographic & echocardiographic findings (number of diseased vessels, LM, proximal LAD, syntax score, EuroScore, LV dysfunction),
  - Medications (aspirin, P2Y<sub>12</sub> blockers, statins, ACEI/ARBs,  $\beta$ -blockers, CCBs),
  - Clinical outcomes (Death, cardiac death, MI, stroke, repeat revascularization)

# Database Pooling

- The pooled database was checked for completeness & consistency by investigators at the AMC.
- Unless specified, previously reported definitions from each study were used for variables.

# Study Outcomes

- **Primary Outcome:**  
A composite of all-cause death, MI, or stroke over all available follow-up.
- **Secondary Outcomes:**  
Death from any causes, cardiac death, MI, stroke, any coronary revascularization, a composite of death or MI

# Statistical Analysis

- All analyses were performed according to the intention-to-treat principle.
- The stratified cox proportional hazards models was used to analyze the impact of revascularization strategy on clinical outcomes and to determine whether merging of the data from 3 trials would influence the primary outcome. A likelihood-ratio test was performed to assess the homogeneity of the data and the assumption of homogeneity was not violated ( $P=0.17$ ).
- Analyses were performed by an independent statistician who was unaware of the treatment assignments. All reported P values are 2 sided, and values of  $P<0.05$  were considered to indicate statistical significance.

# Baseline Characteristics

	CABG (n=1639)	PCI (n=1641 )
Age (years)	64.5±9.7	64.2±9.7
Men	1264 (77.1%)	1222 (74.5%)
Current smoking	368 (22.5%)	344 (21.0%)
Diabetes	532 (32.5%)	534 (32.5%)
Stable CAD	987 (60.2%)	1030 (62.8%)
Previous MI	349 (21.4%)	323 (19.8%)
Previous stroke	76 (4.6%)	72 (4.4%)
LM	649 (39.6%)	657 (40.0%)
MVD	991 (60.5%)	984 (60.0%)
SYNTAX score	27.3±10.7	26.7±10.3
Follow-up (years)	4.4±1.4	4.4±1.3

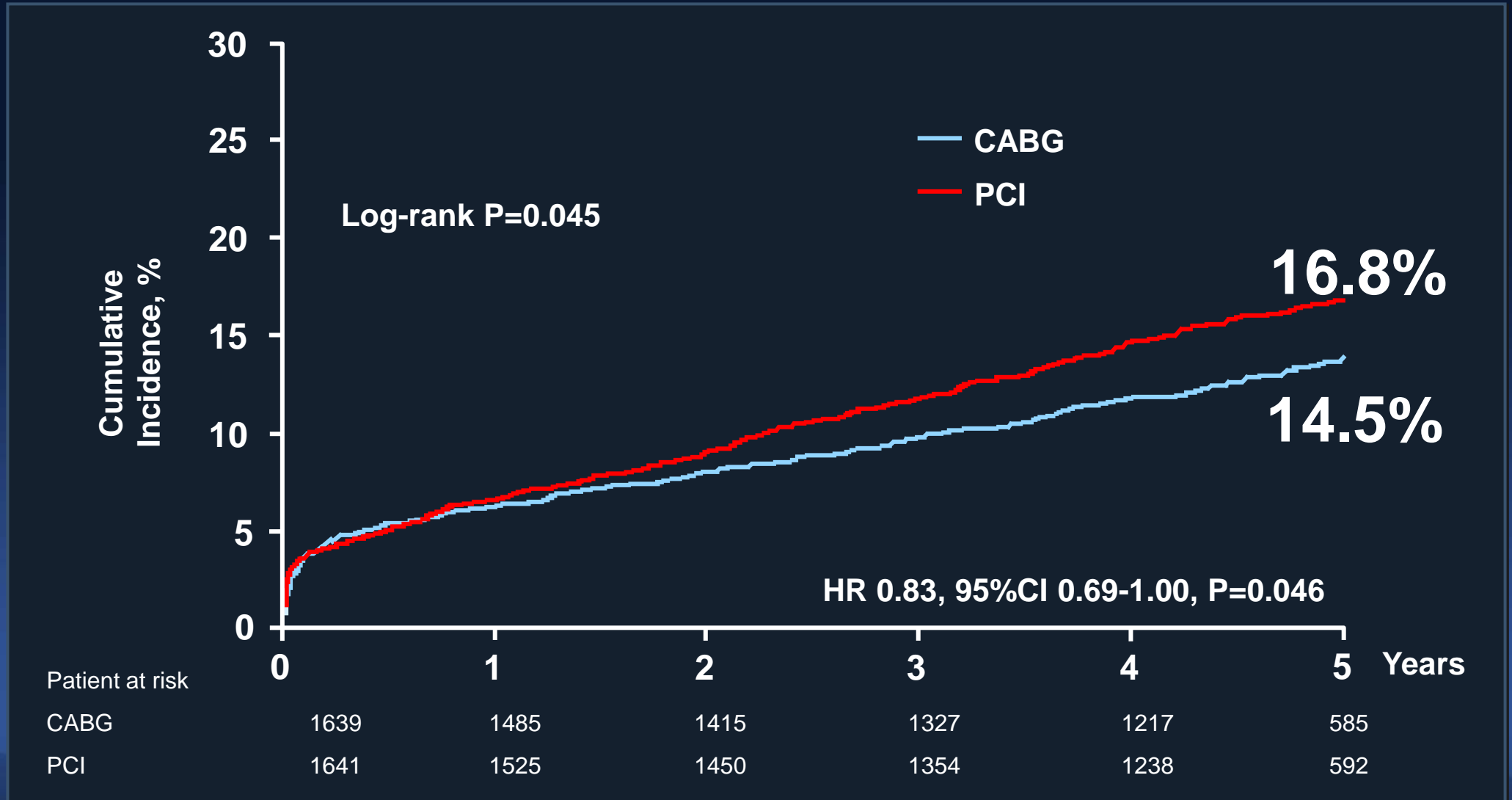


# Medications at Discharge & Follow-Up

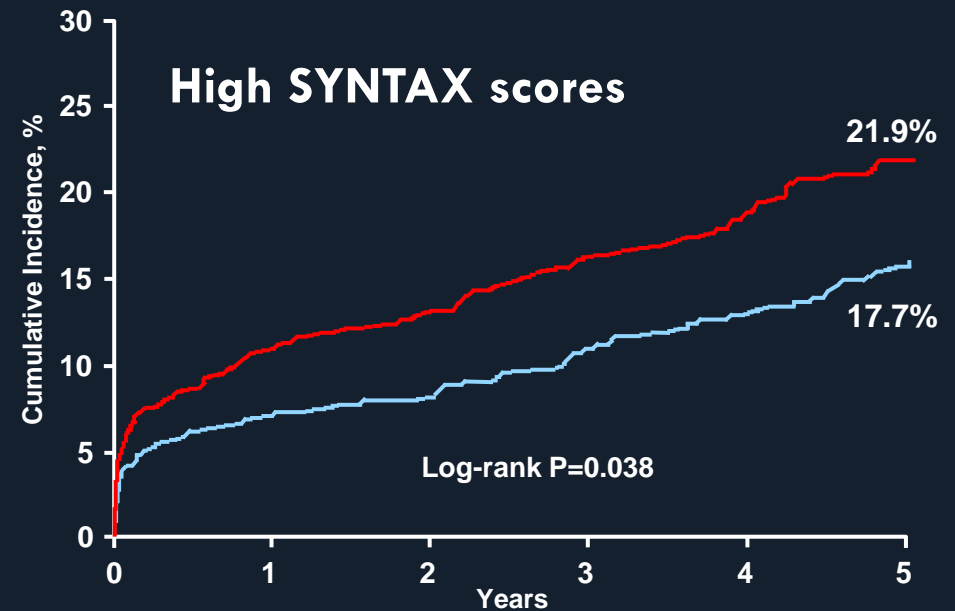
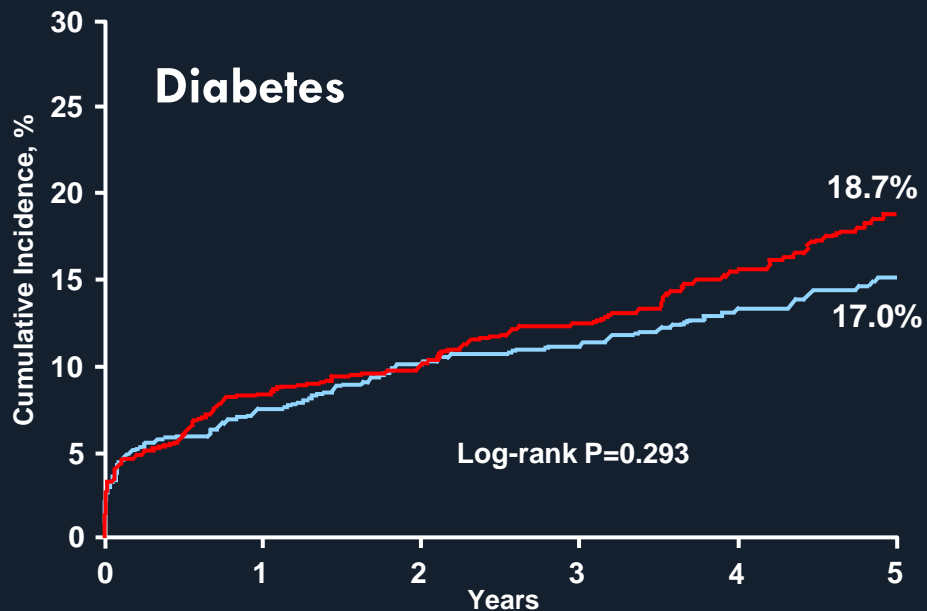
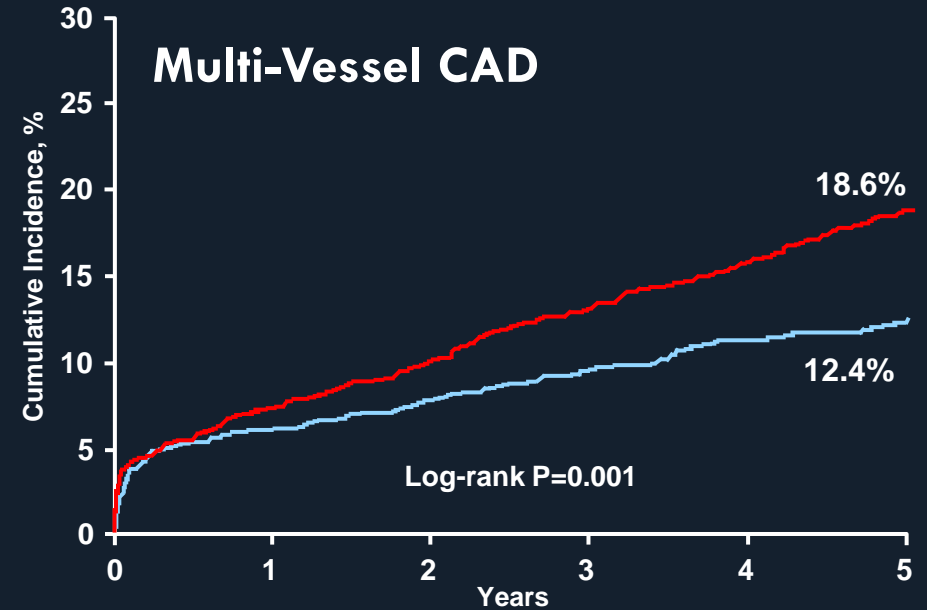
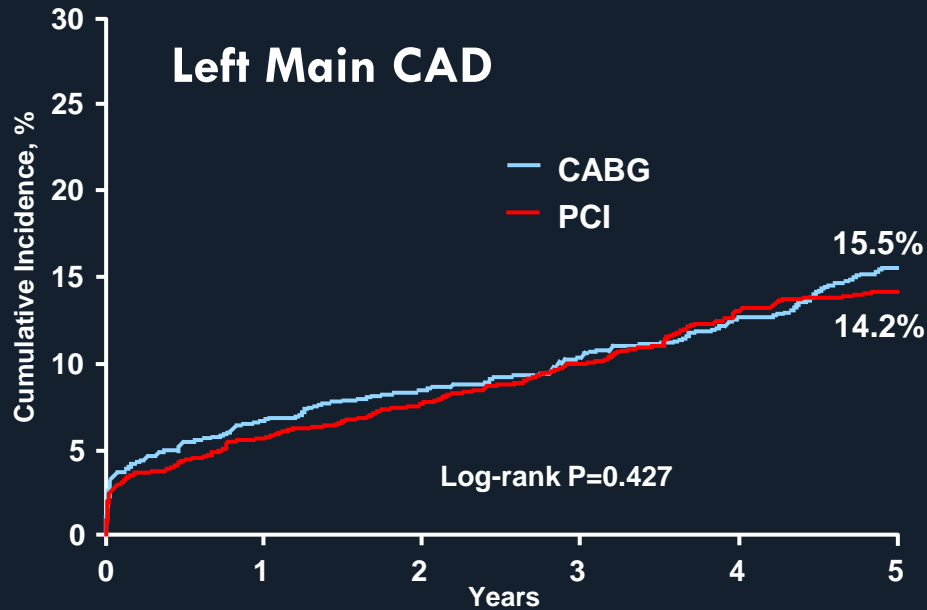
	CABG (N=1639)	PCI (N=1641)	P value
<b>Aspirin</b>			
At discharge	1487(92.6)	1583(97.0)	<0.001
1 year after randomization	1376(88.7)	1462(92.6)	<0.001
5 year after randomization	999(81.6)	1082(85.5)	0.013
<b>P2Y<sub>12</sub> inhibitors</b>			
At discharge	837(52.1)	1583(97.0)	<0.001
1 year after randomization	648(41.8)	1245(78.8)	<0.001
5 year after randomization	317(25.9)	570(45.1)	<0.001
<b>Statins</b>			
At discharge	1233(76.8)	1356(83.1)	<0.001
1 year after randomization	1262(81.4)	1334(84.5)	0.010
5 year after randomization	902(73.7)	963(76.1)	0.152

Percentages are based on the number of non-missing values.

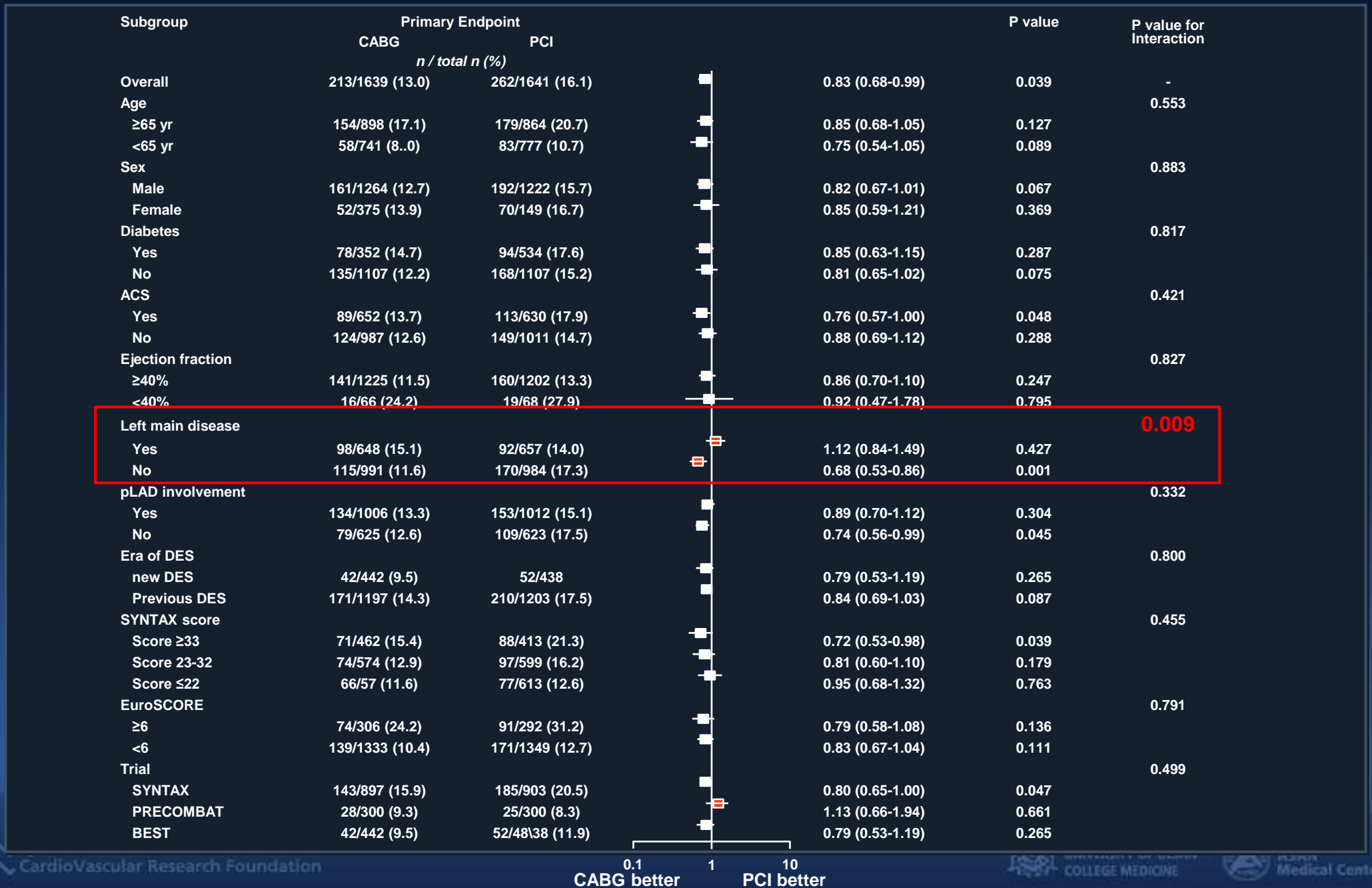
# Primary Outcome: Death, MI or Stroke



# Primary Outcome in Major Subgroups



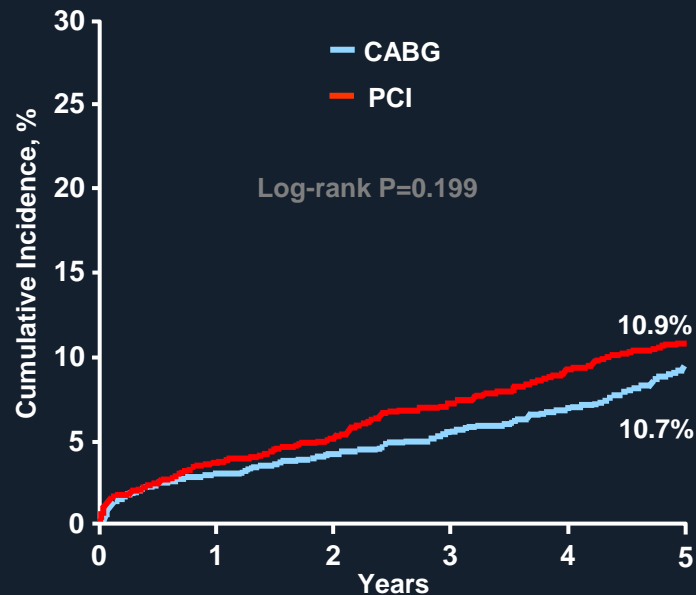
# Primary Outcome: Subgroup Analysis



# Secondary Outcomes:

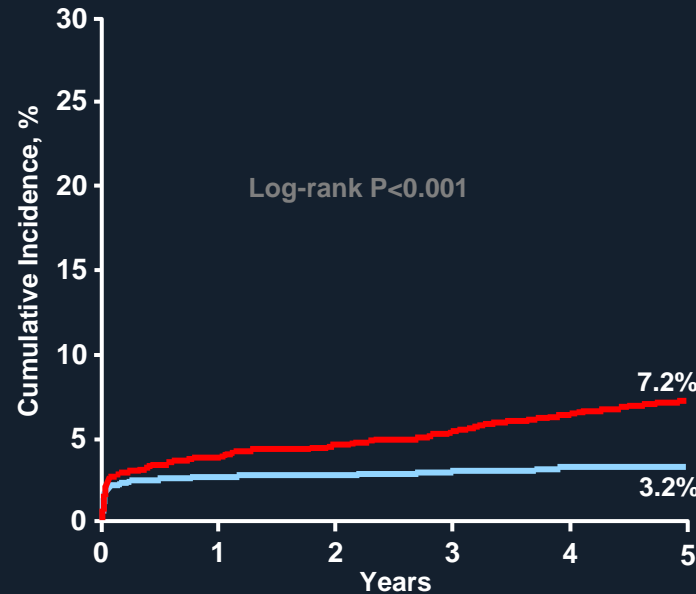
Individual Components of Primary Outcome

## Death



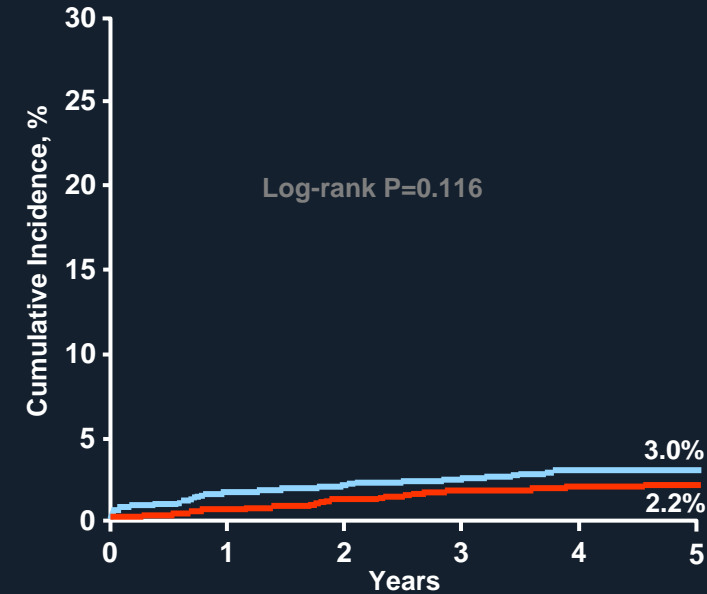
HR 0.86, 95%CI, 0.69-1.08,  
P=0.199

## MI



HR 0.46, 95%CI, 0.33-0.64,  
P<0.001

## Stroke



HR 1.43, 95%CI, 0.92-2.24,  
P=0.116

# Conclusions

- CABG, as compared to PCI with DES, significantly reduced the risk of all-cause death, MI, or stroke in patients with left main or multivessel CAD.
- The benefit of CABG was particularly pronounced in patients with multivessel CAD, but not in those with left main CAD.