ESC GUIDELINES FOR REVASCULARIZATION

SHOULD WE EXPECT CHANGE IN THE VIEW OF RECENT TRIALS

MARTIN MATES

NEMOCNICE NA HOMOLCE

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ESC/EACTS GUIDELINES

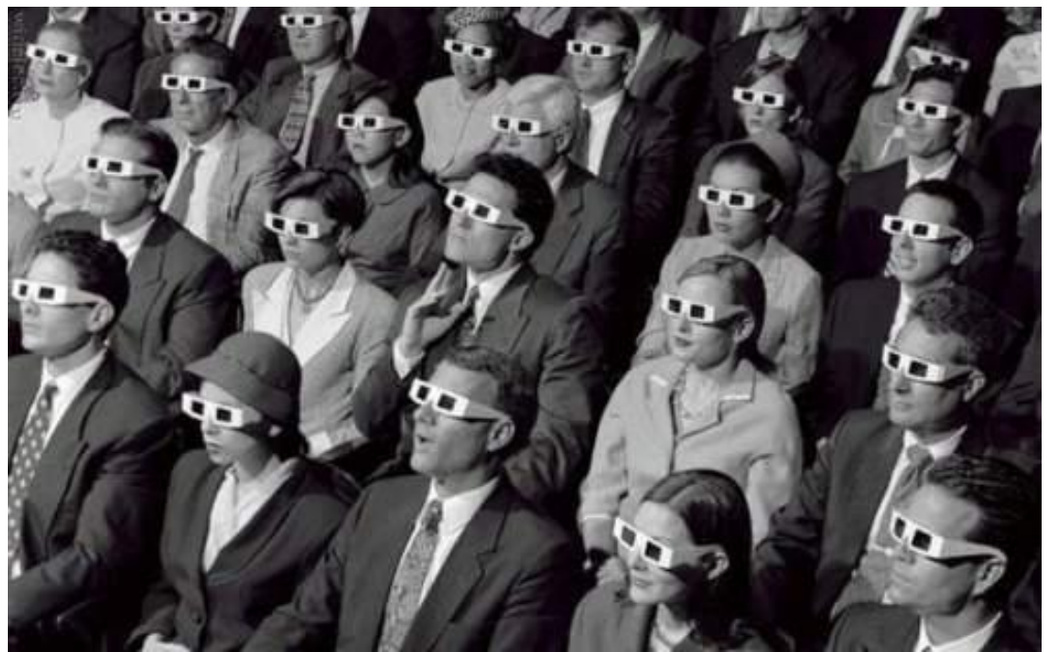
2014 ESC/EACTS Guidelines on myocardial revascularization

The Task Force on Myocardial Revascularization of the European Society of Cardiology (ESC) and the European Association for Cardio-Thoracic Surgery (EACTS)

Developed with the special contribution of the European Association of Percutaneous Cardiovascular Interventions (EAPCI)

ROLE OF HEART TEAM

	ACS			Multivessel SCAD	SCAD with *ad-hoc* PCI indication according to predefined Heart-Team protocols
	Shock	STEMI	NSTE-ACS		
Multidisciplinary decision making	Not mandatory during the acute phase. Mechanical circulatory support according to Heart-Team protocol.	Not mandatory during the acute phase.	Not mandatory during the acute phase. After stabilization recommended as in stable multivessel CAD.	Required.	Not required.



INDICATION FOR REVASCULARIZATION

- Stenosis > 50% and < 90% with documented ischaemia or FFR ≤ 0,80

Extent of CAD (anatomical and/or functional)		Class[b]	Level[c]	References
For prognosis	Left main disease with stenosis >50%[a]	I	A	108,134,135
	Any proximal LAD stenosis >50%[a]	I	A	94,108,135,136
	Two-vessel or three-vessel disease with stenosis > 50%[a] with impaired LV function (LVEF<40%)[a]	I	A	93,94,108,112, 121,135,137–142
	Large area of ischaemia (>10% LV)	I	B	54,91,97,99,143,144
	Single remaining patent coronary artery with stenosis >50%[a]	I	C	
For symptoms	Any coronary stenosis >50%[a] in the presence of limiting angina or angina equivalent, unresponsive to medical therapy	I	A	54,96,105,108, 118–120,145

PCI vs CABG

Recommendations according to extent of CAD	CABG		PCI	
	Class[a]	Level[b]	Class[a]	Level[b]
One or two-vessel disease without proximal LAD stenosis.	IIb	C	I	C
One-vessel disease with proximal LAD stenosis.	I	A	I	A
Two-vessel disease with proximal LAD stenosis.	I	B	I	C
Left main disease with a SYNTAX score ≤ 22.	I	B	I	B
Left main disease with a SYNTAX score 23–32.	I	B	IIa	B
Left main disease with a SYNTAX score >32.	I	B	III	B
Three-vessel disease with a SYNTAX score ≤ 22.	I	A	I	B
Three-vessel disease with a SYNTAX score 23–32.	I	A	III	B
Three-vessel disease with a SYNTAX score >32.	I	A	III	B

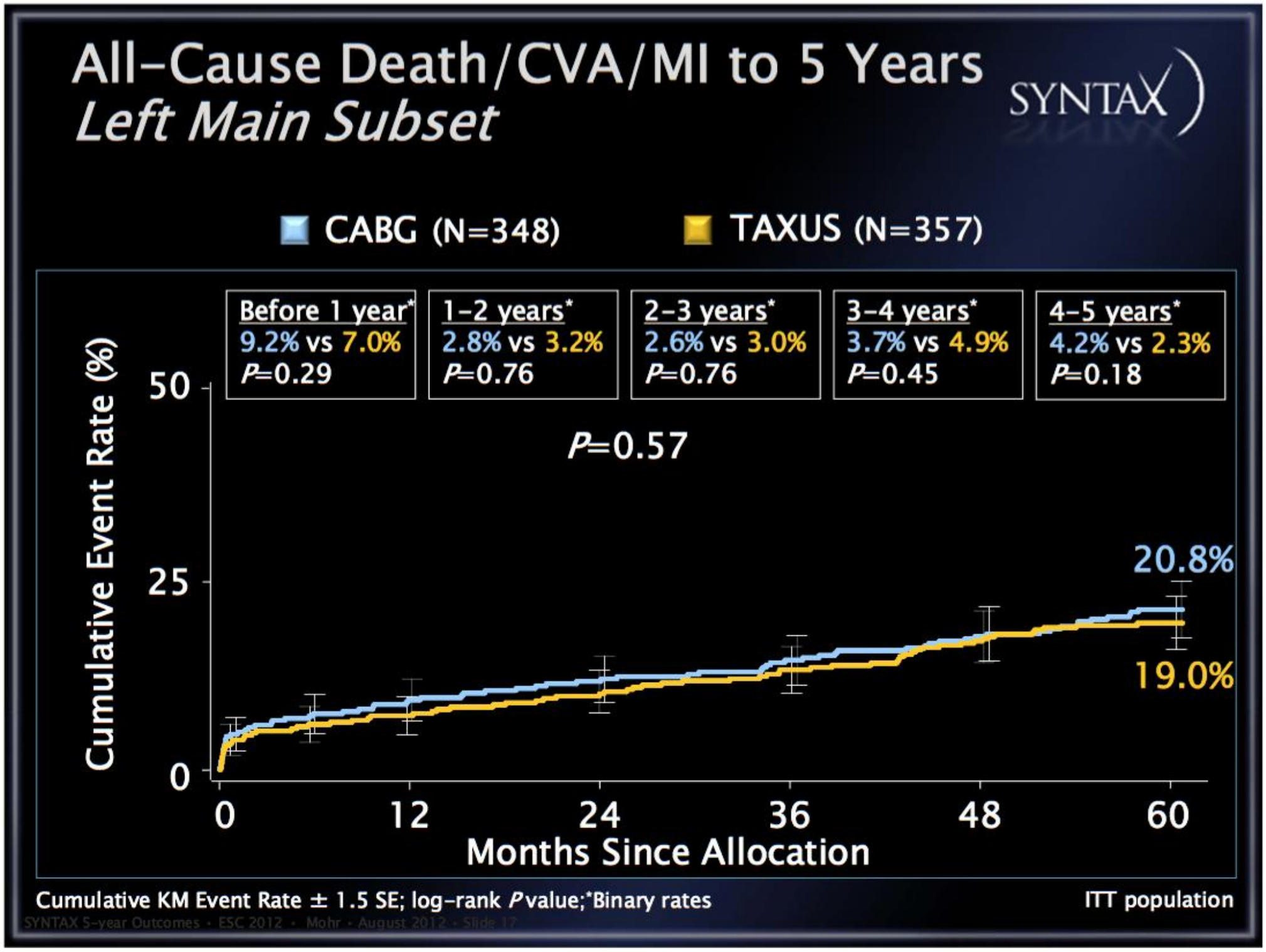
LEFT MAIN DISEASE

- 5-7% patients undergoing cardiac catheterization
- Usually associated with diffuse CAD
- Early clinical trial – CABG better than medical treatment
- CABG – “golden standard” for treatment of left main disease
- PCI used to be reserved for poor surgical candidates

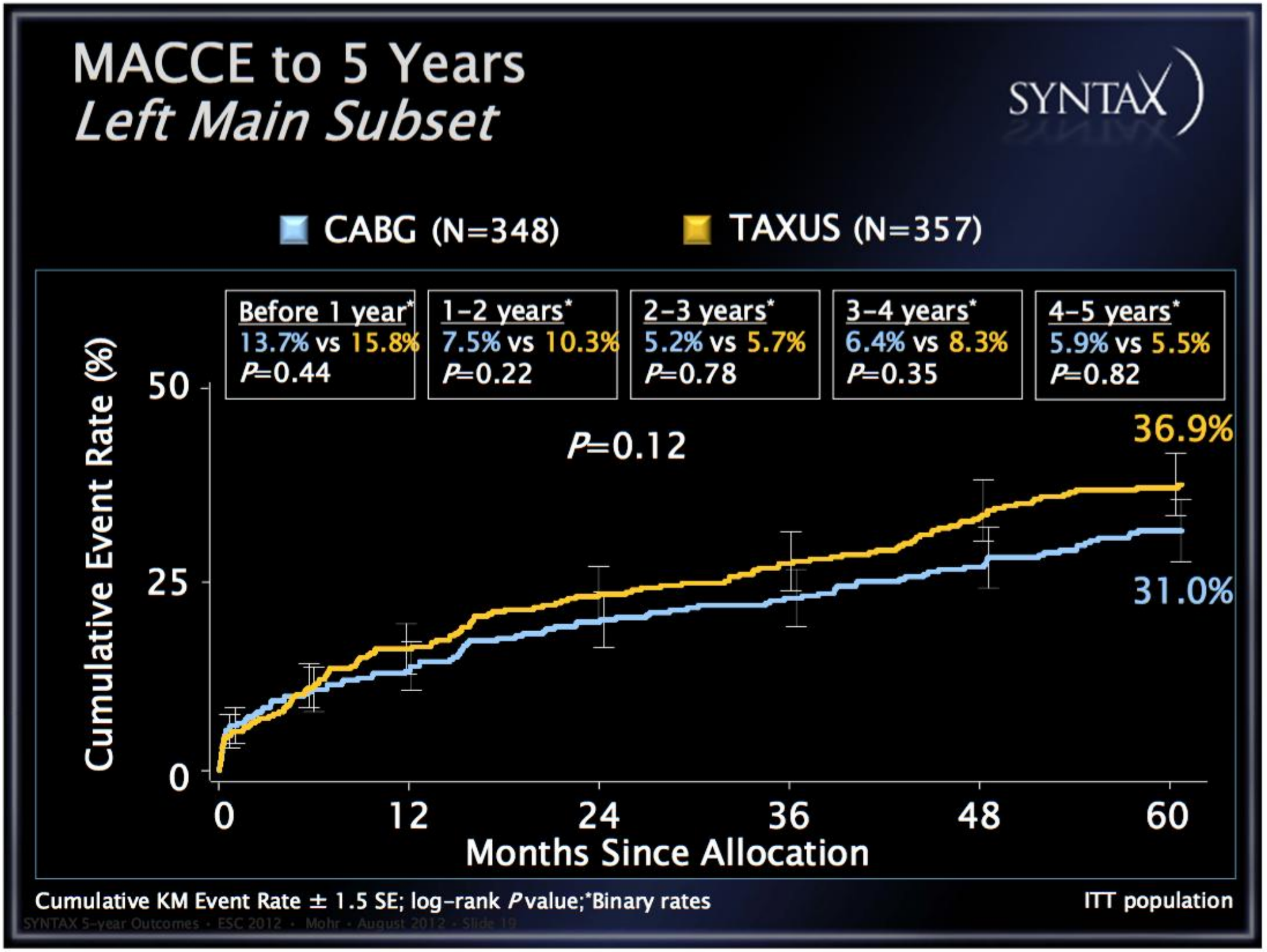
PCI FOR LEFT MAIN DISEASE

- Until 2000 – data from non-radomized studies and registries
- Small randomized studies
- Syntax trial 2009 (PCI with DES vs. CABG)
  - Subset of 750 patients with LM disease (published 2013)
  - 5 year outcome

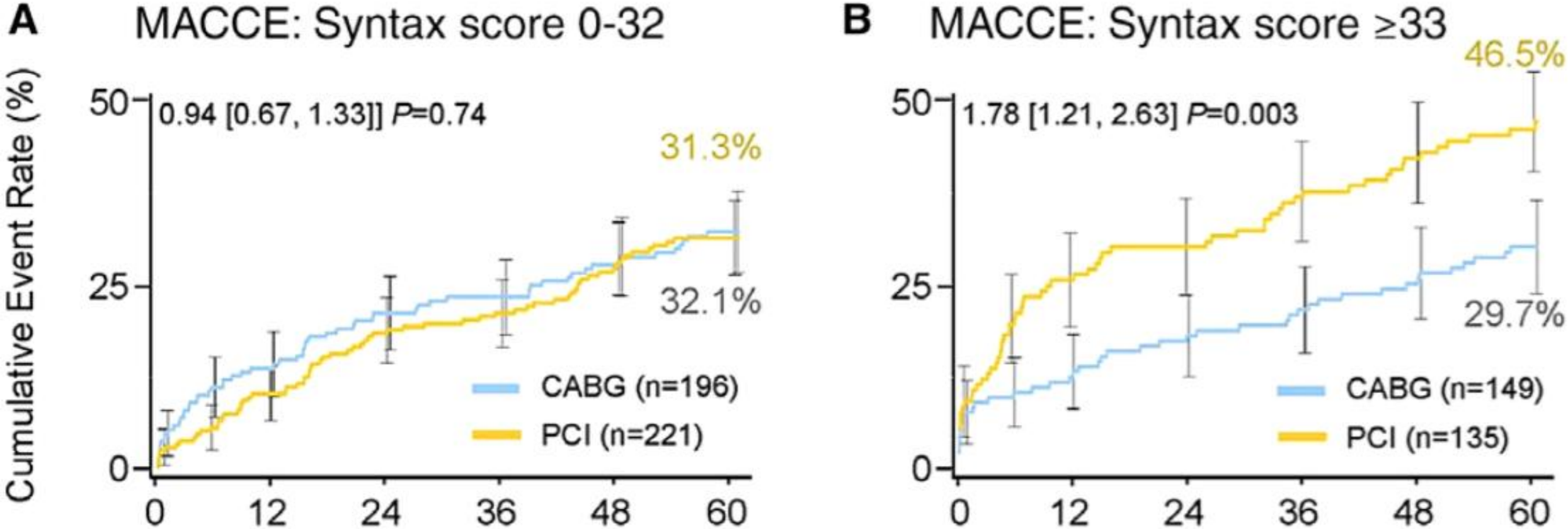
SYNTAX TRIAL – LEFT MAIN SUBSET



SYNTAX TRIAL – (LEFT MAIN SUBSET) - MACCE



SYNTAX Trial - Left main subset



PCI VS CABG FOR LEFT MAIN DISEASE

Recommendations according to extent of CAD	CABG		PCI	
	Class[a]	Level[b]	Class[a]	Level[b]
One or two-vessel disease without proximal LAD stenosis.	IIb	C	I	C
One-vessel disease with proximal LAD stenosis.	I	A	I	A
Two-vessel disease with proximal LAD stenosis.	I	B	I	C
Left main disease with a SYNTAX score ≤ 22.	I	B	I	B
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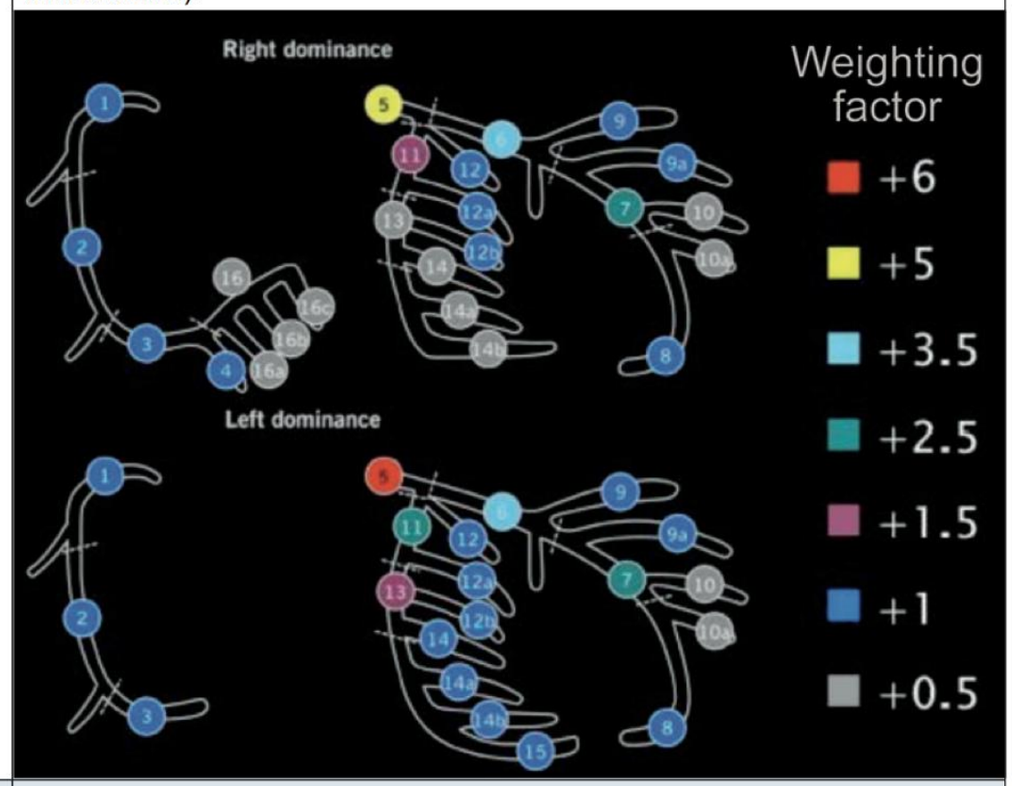
Three-vessel disease with a SYNTAX score >32.	I	A	III	B

PCI vs. CABG = SYNTAX score

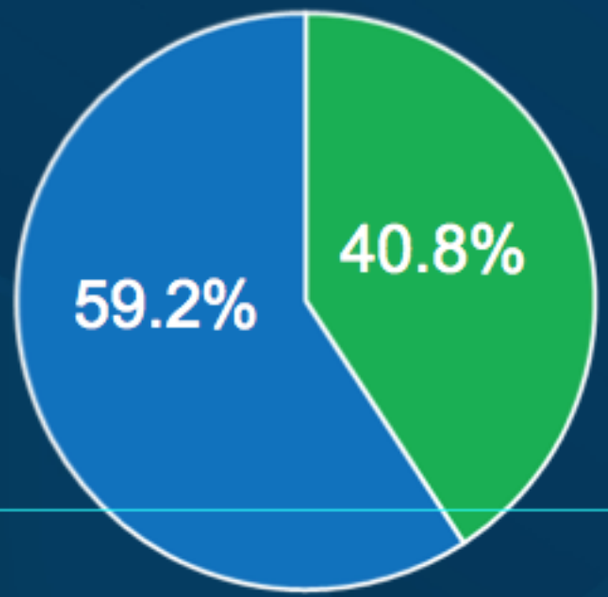
Table 3 **Guide to calculate the SYNTAX score**

Steps	Variable assessed	Description
Step 1	Dominance	The weight of individual coronary segments varies according to coronary artery dominance (right or left). Co-dominance does not exist as an option in the SYNTAX score.
Step 2	Coronary segment	The diseased coronary segment directly affects the score as each coronary segment is assigned a weight, depending on its location, ranging from 0.5 (i.e. posterolateral branch) to 6 (i.e. left main in case of left dominance). 
Step 3	Diameter stenosis	The score of each diseased coronary segment is multiplied by 2 in case of a stenosis 50–99% and by 5 in case of total occlusion. In case of total occlusion, additional points will be added as follows: - Age >3 months or unknown +1 - Blunt stump +1 - Bridging +1 - First segment visible distally +1 per non visible segment - Side branch at the occlusion +1 if <1.5mm diameter +1 if both <1.5 and ≥1.5mm diameter

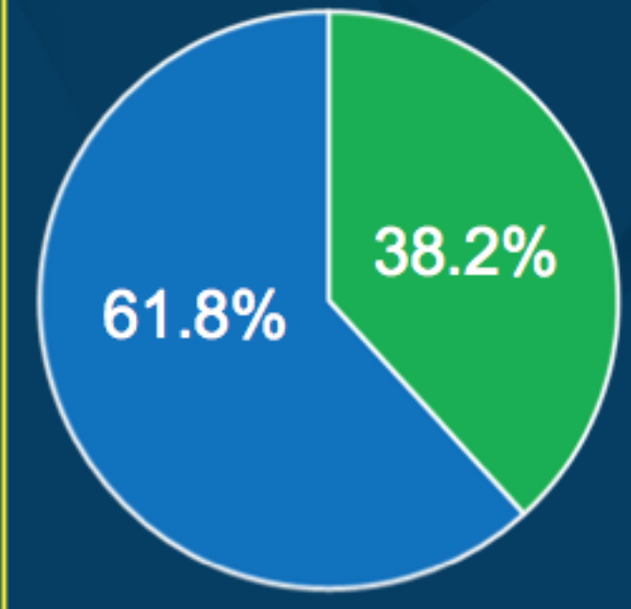
EXCEL

SYNTAX Score

Site Reported



Mean 20.6 ± 6.2



Mean 20.5 ± 6.1

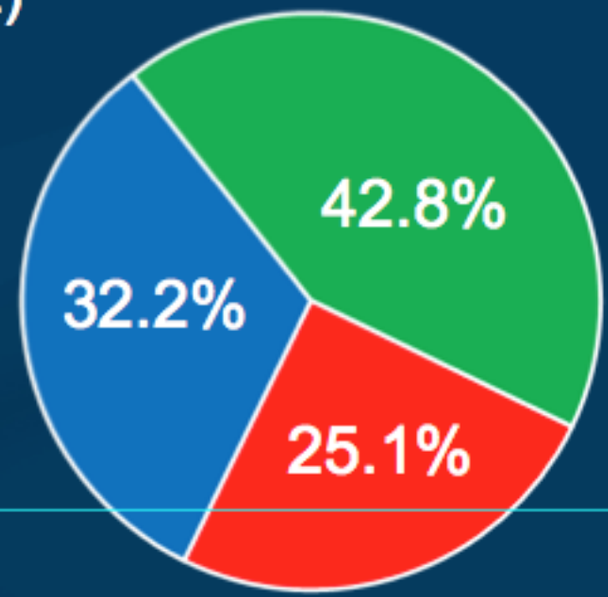
P=0.52

Low (≤22)
Intermediate (23-32)
High (≥33)

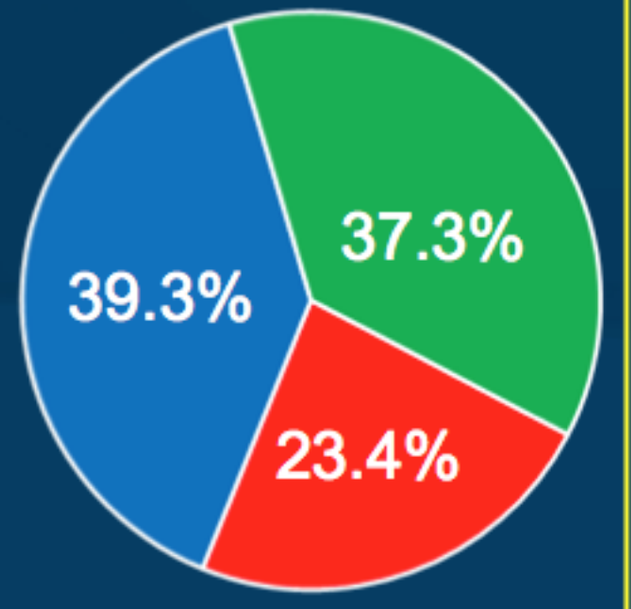
PCI

CABG

Core Lab



Mean 26.9 ± 8.8



Mean 26.0 ± 9.8

P=0.005

NEW randomized controlled trials comparing PCI and CABG for left main disease

- **EXCEL**

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 DECEMBER 8, 2016 VOL. 375 NO. 23

Everolimus-Eluting Stents or Bypass Surgery for Left Main Coronary Artery Disease

G.W. Stone, J.F. Sabik, P.W. Serruys, C.A. Simonton, P. Généreux, J. Puskas, D.E. Kandzari, M.-C. Morice, N. Lembo, W.M. Brown III, D.P. Taggart, A. Banning, B. Merkely, F. Horkay, P.W. Boonstra, A.J. van Boven, I. Ungi, G. Bogáts, S. Mansour, N. Noiseux, M. Sabaté, J. Pomar, M. Hickey, A. Gershlick, P. Buszman, A. Bochenek, E. Schampaert, P. Pagé, O. Dressler, I. Kosmidou, R. Mehran, S.J. Pocock, and A.P. Kappetein, for the EXCEL Trial Investigators*

- **NOBLE**

Percutaneous coronary angioplasty versus coronary artery bypass grafting in treatment of unprotected left main stenosis (NOBLE): a prospective, randomised, open-label, non-inferiority trial

*Timo Mäkikallio, Niels R Holm, Mitchell Lindsay, Mark S Spence, Andrejs Erglis, Ian B A Menown, Thor Trovik, Markku Eskola, Hannu Romppanen, Thomas Kellerth, Jan Ravkilde, Lisette O Jensen, Gintaras Kalinauskas, Rikard B A Linder, Markku Pentikainen, Anders Hervold, Adrian Banning, Azfar Zaman, Jamen Cotton, Erlend Eriksen, Sulev Margus, Henrik T Sørensen, Per H Nielsen, Matti Niemelä, Kari Kervinen, Jens F Lassen, Michael Maeng, Keith Oldroyd, Geoff Berg, Simon J Walsh, Colm G Hanratty, Indulis Kumsars, Peteris Stradins, Terje K Steigen, Ole Fröbert, Alastair N J Graham, Petter C Endresen, Matthias Corbascio, Olli Kajander, Uday Trivedi, Juha Hartikainen, Vesa Anttila, David Hildick-Smith, Leif Thuesen, Evald H Christiansen, for the NOBLE study investigators**

Summary

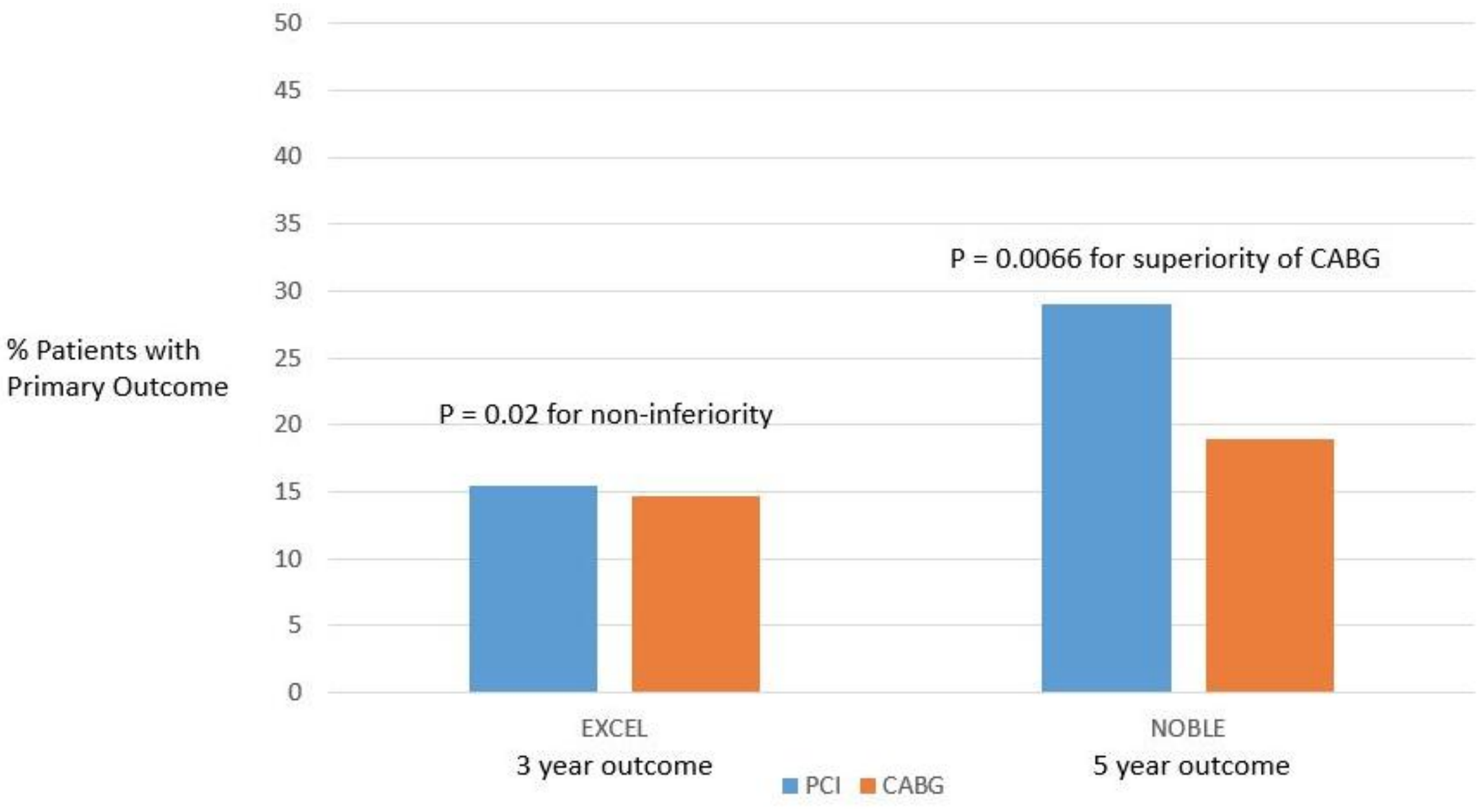
Background Coronary artery bypass grafting (CABG) is the standard treatment for revascularisation in patients with

Lancet 2016; 388: 2743–52

PCI vs CABG

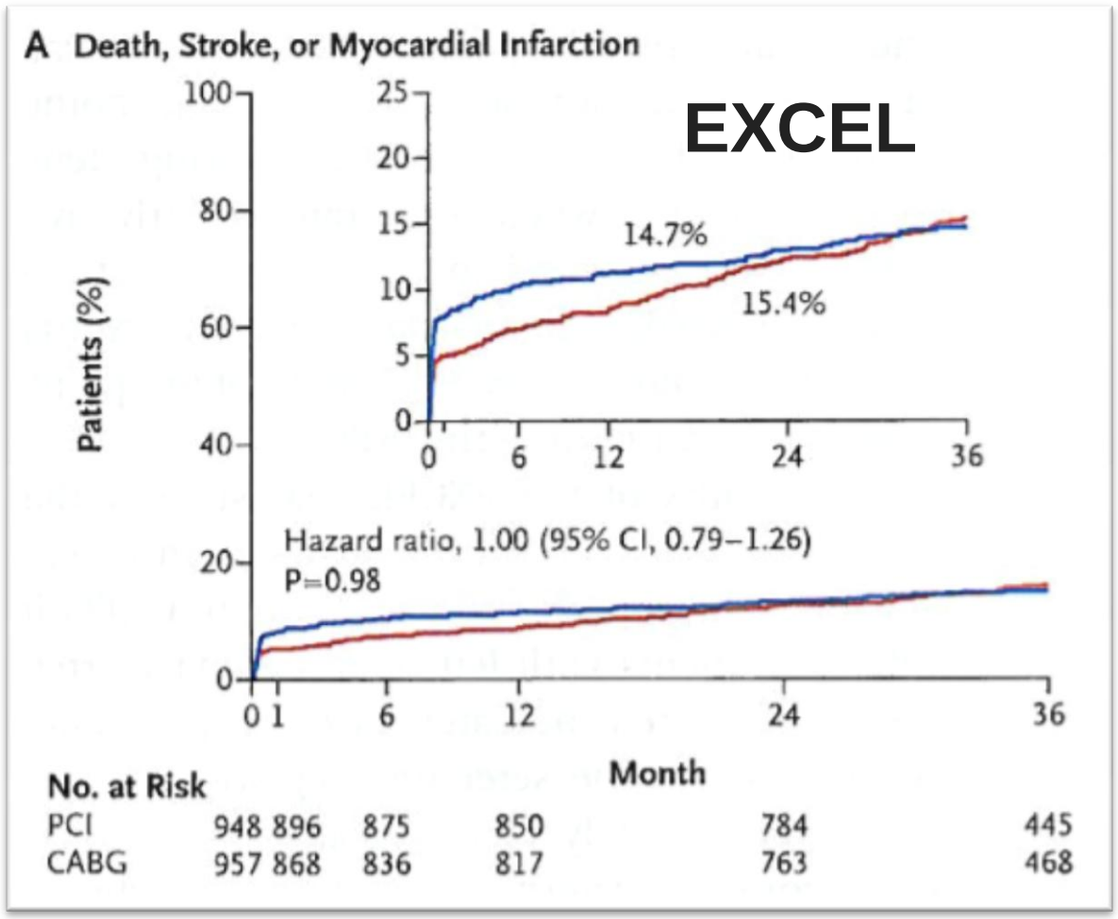
	EXCEL	NOBLE
Patients (n)	1905	1201
Follow-up	3 years	5 years
Syntax score	<32	
	Everolimus DES	Biolimus DES
Primary endpoint	Death any, stroke, MI	Death any, non-procedural MI, stroke, repeated revascularization
Patients details	60% stable, 30% diabetics	82% stable, 15% diabetics
	77% IVUS	74% IVUS
Syntax	20,6	22,5

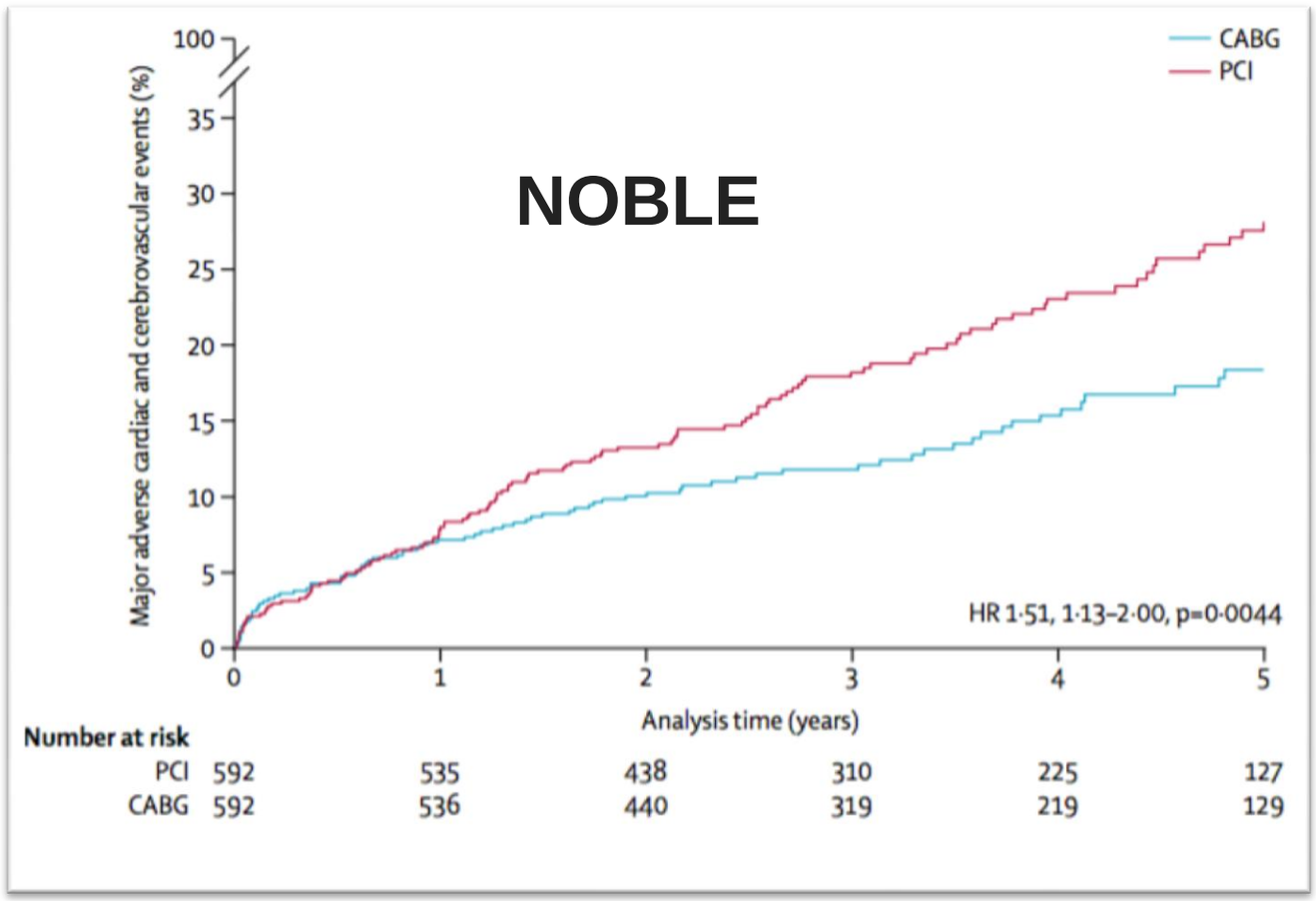
	EXCEL	NOBLE
Primary endpoint	Death any, stroke, MI	Death any, non-procedural MI, stroke, repeated revascularization
PCI vs. CABG	15.4% vs. 14,7%	29% vs. 19%



MACCE

At 3 years (EXCEL) and 5 years (NOBEL)



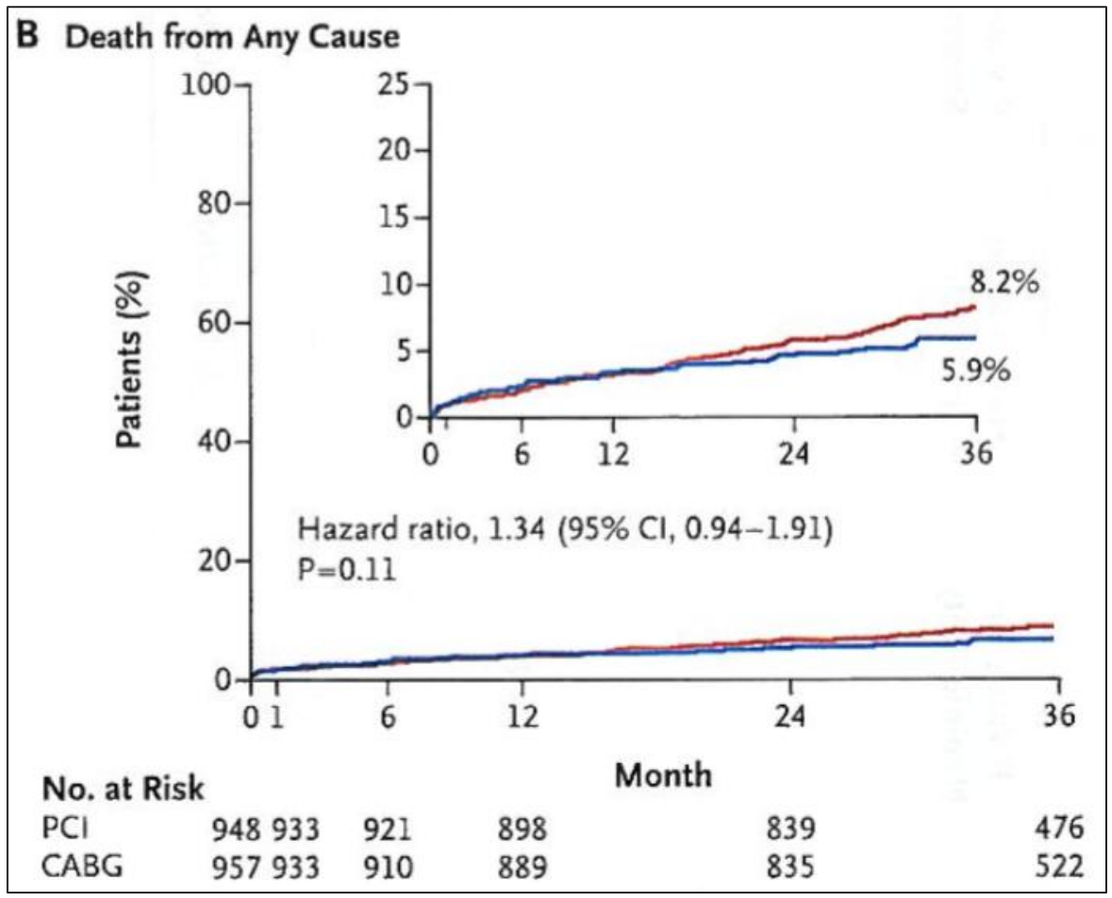


<u>Primary endpoint</u>
Death any cause
Stroke
Myocardial infraction

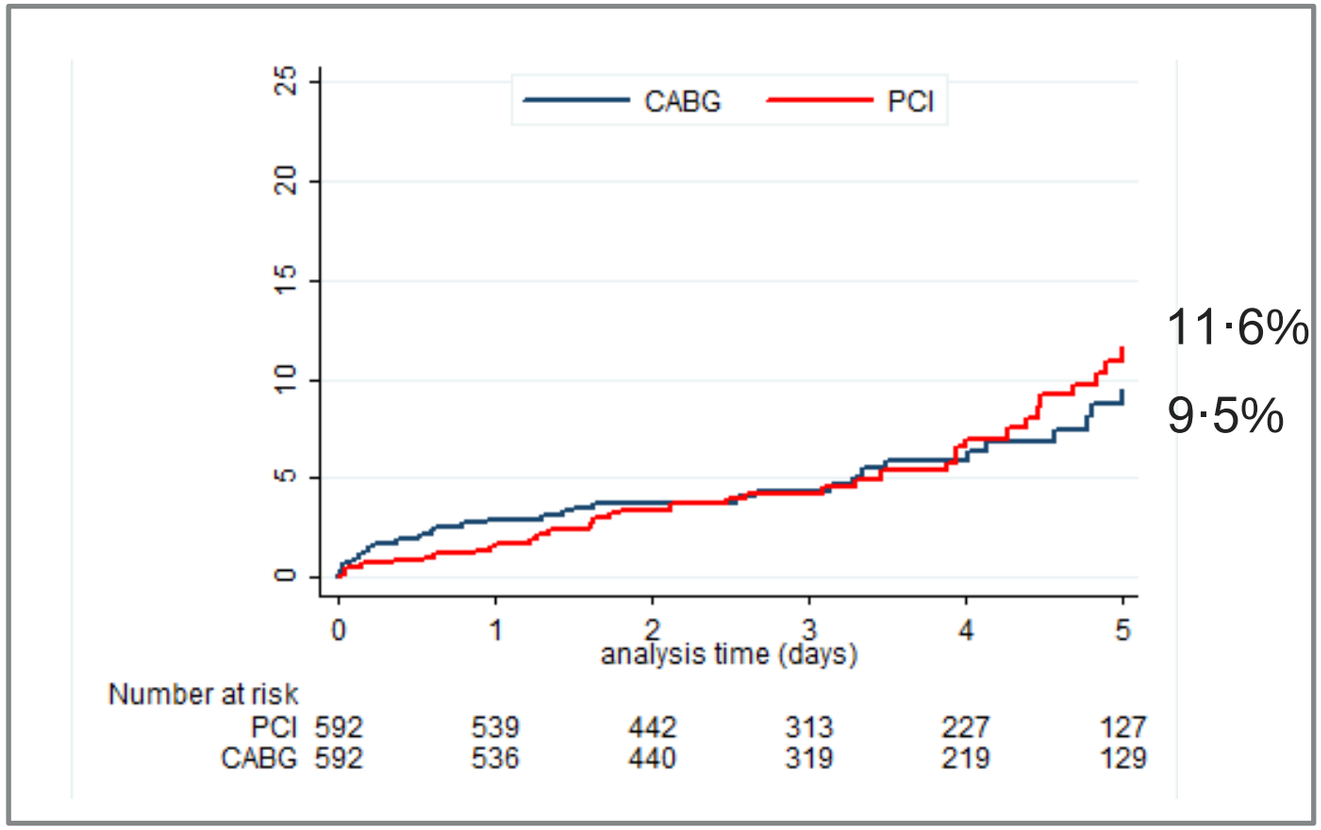
<u>Primary endpoint</u>
Death any cause
Stroke
Non-procedural myocardial infraction
Repeated revascularization

MORTALITY (TOTAL)
AT 3 YEARS (EXCEL) AND 5 YEARS (NOBEL)

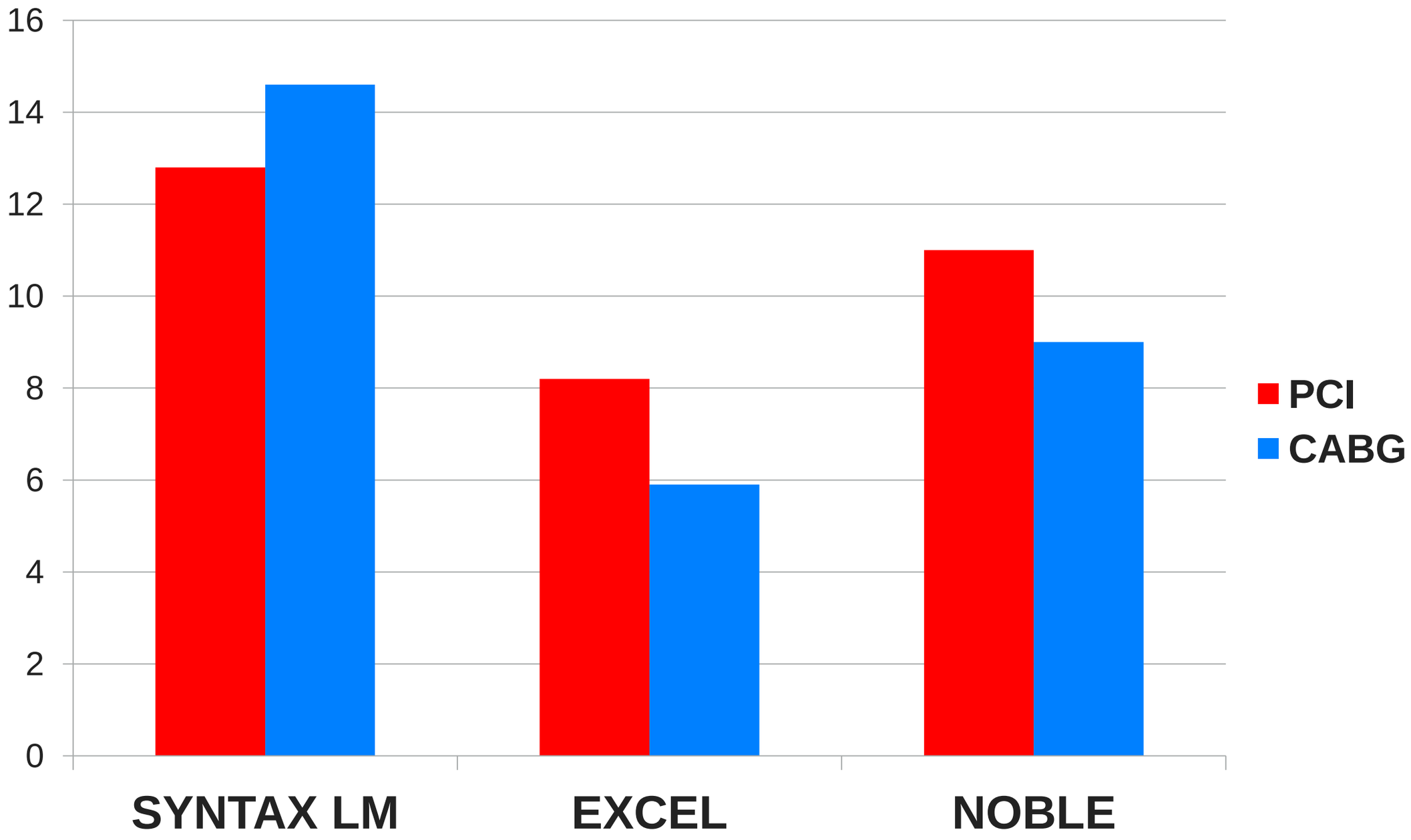
EXCEL



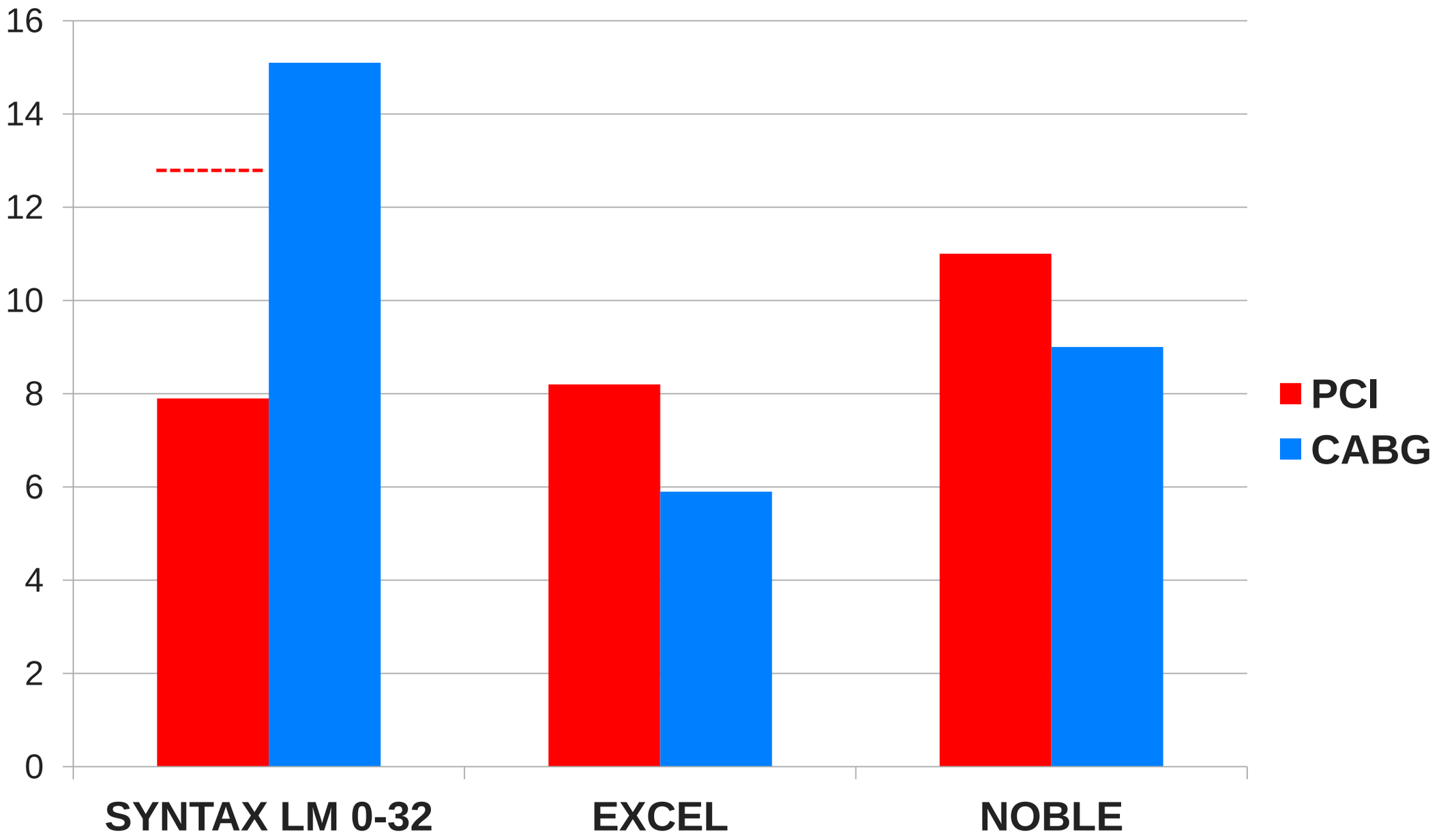
NOBEL



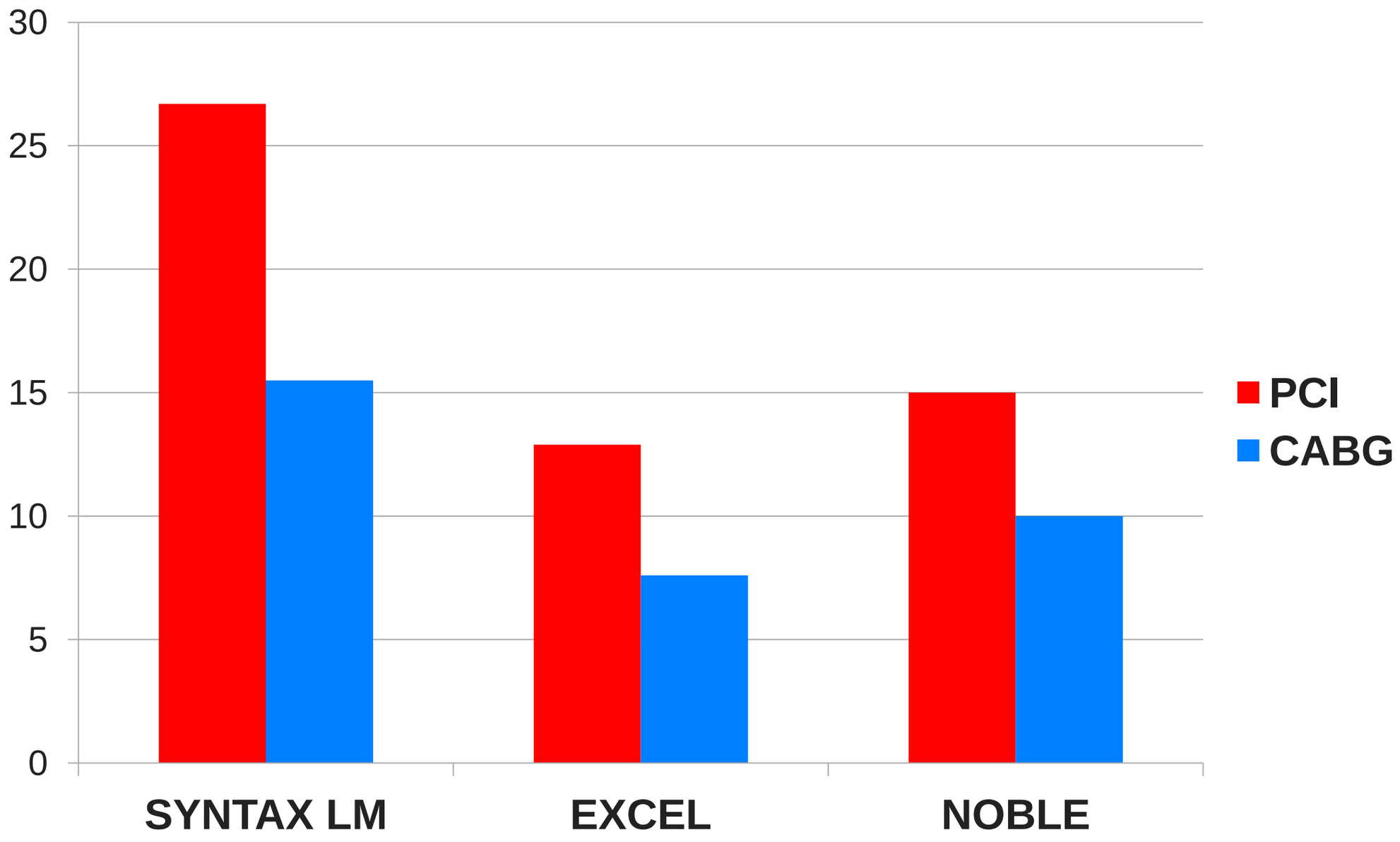
TOTAL MORTALITY



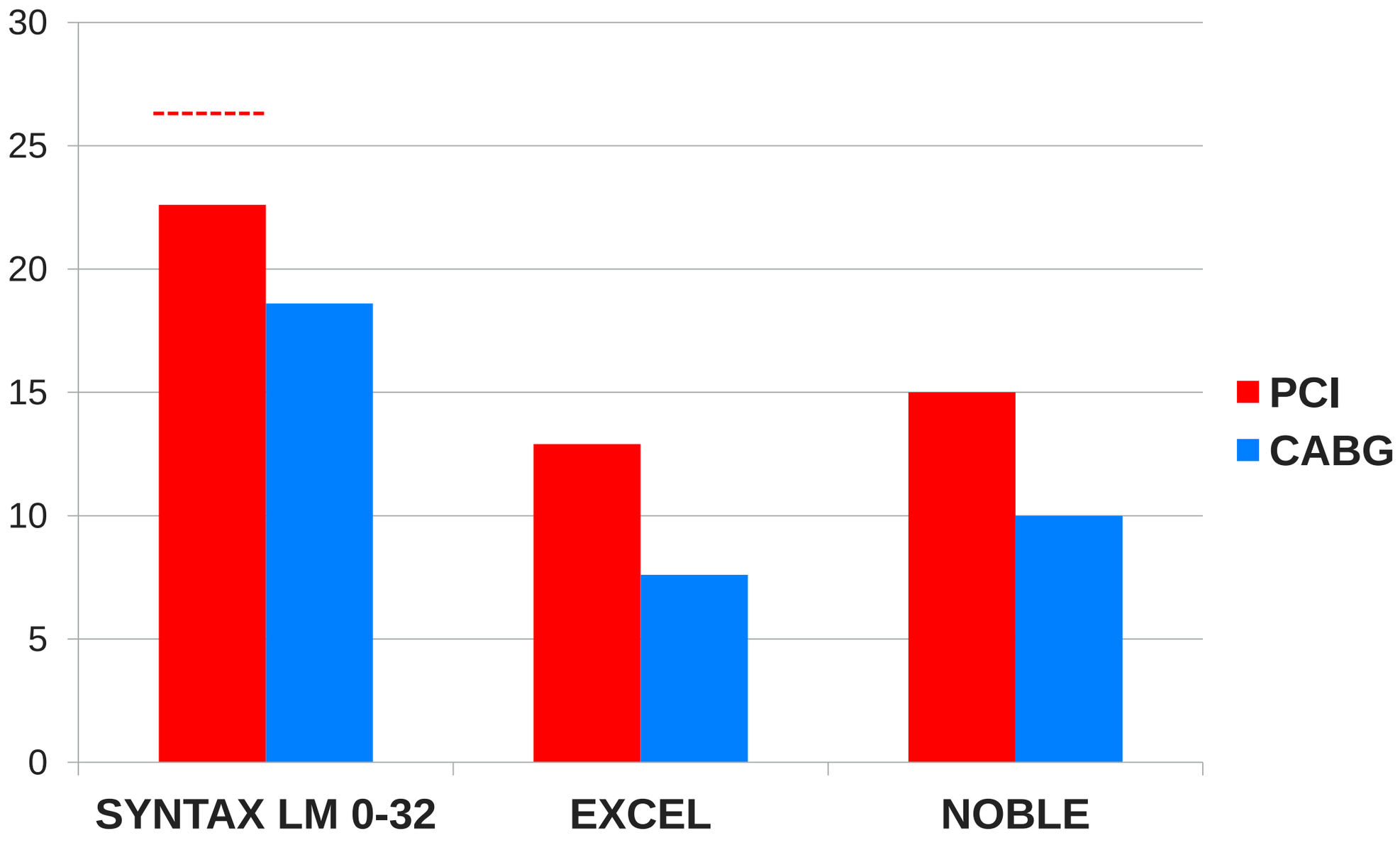
TOTAL MORTALITY (WHEN SYNTAX SCORE 0-32)



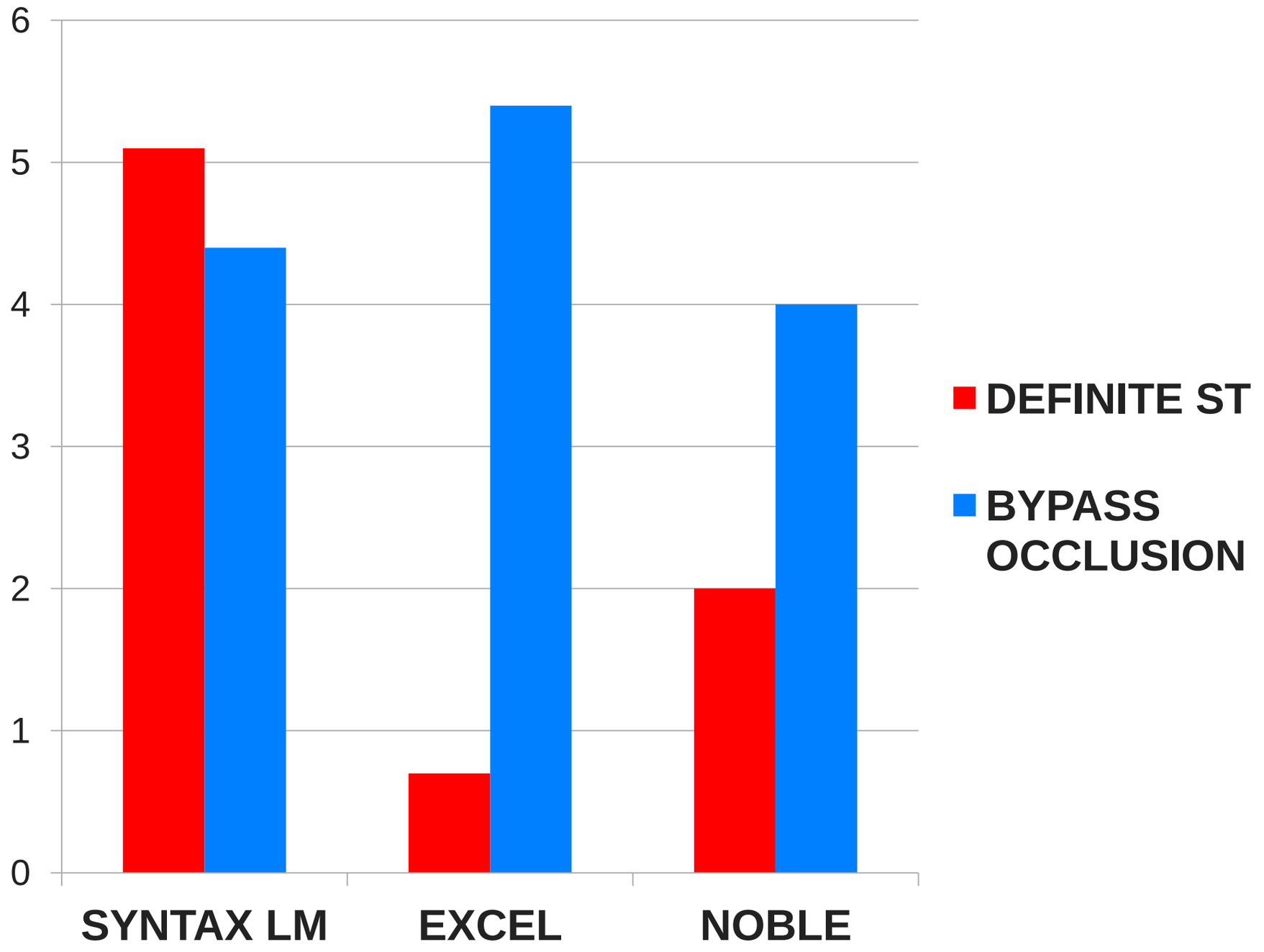
NEED FOR REVASCULARIZATION



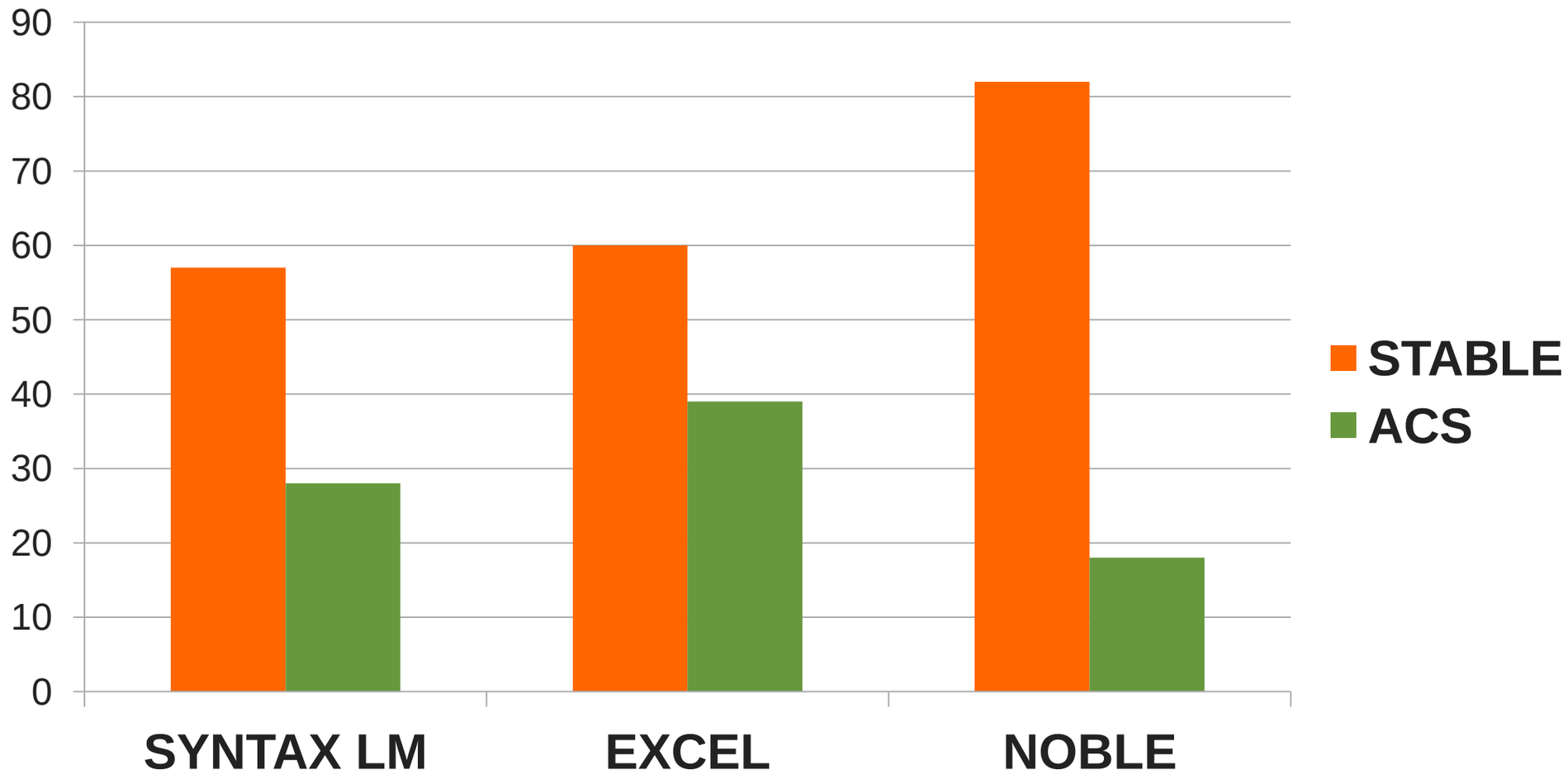
NEED FOR REVASCULARIZATION
(WHEN SYNTAX SCORE 0-32)



STENT THROMBOSIS AND BYPASS GRAFT OCCLUSION



DATA FOR ACS PATIENTS?



SYNTAX – no patients with recent MI enrolled

EXCEL – 14% patient with NSTEMI or STEMI

NOBLE – data for troponin positive ACS not available

CONCLUSION

- Duration of RCT is an important factor when comparing PCI and CABG
- RCT focus on stable CAD
- PCI of LM disease in patient with low and intermediate Syntax score is reasonable alternative to CABG in stable CAD
- The heart team for decision making
- IVUS is used in majority of LM percutaneous interventions
- Syntax score calculation