

# **P2Y12 Inhibitor or Aspirin for Long-term Antiplatelet Management**

**Kyung Woo Park, MD, PhD, MBA**

**May 6, 2023**

- Within the past 12 months I have had a financial interest/arrangement or affiliation with the organization(s) listed below

**Kyung Woo Park, MD, PhD, MBA**

**Speaker's fee**

Daiichi Sankyo

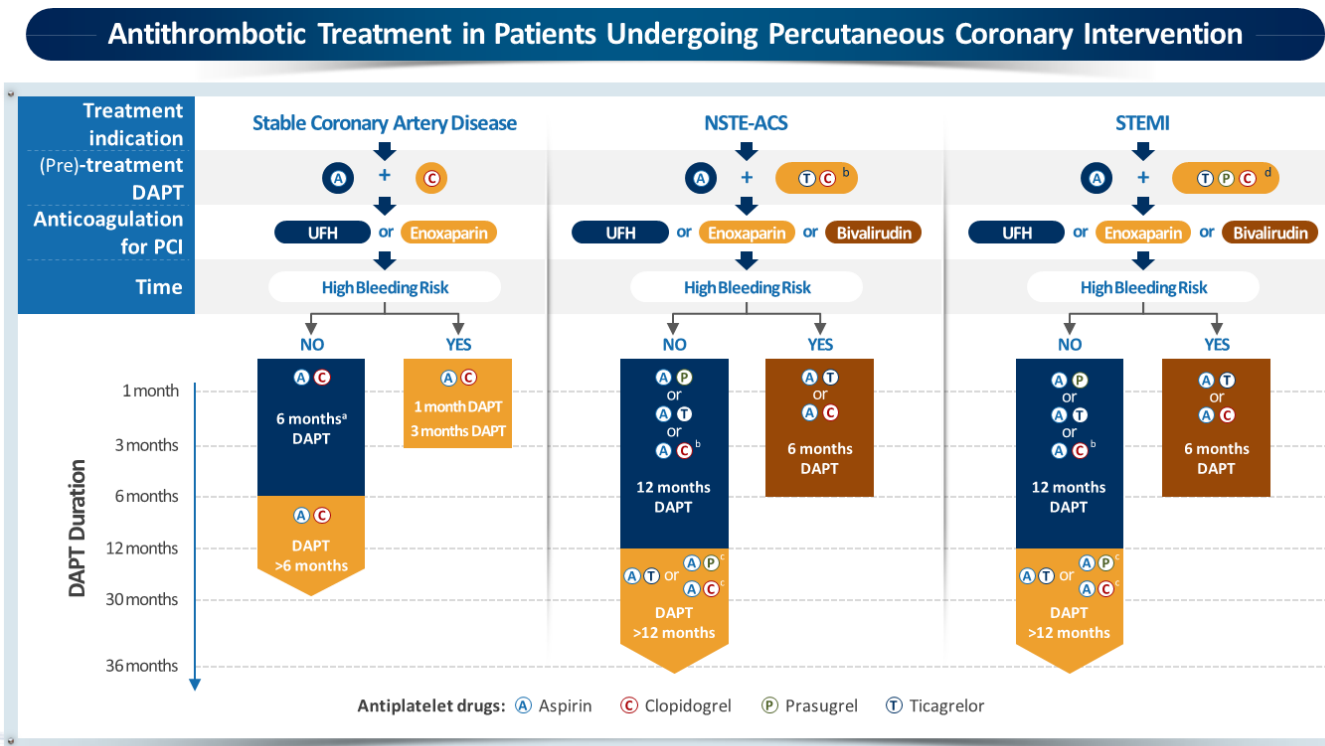
InnoN Pharmaceutical

Daewoong Pharmaceutical

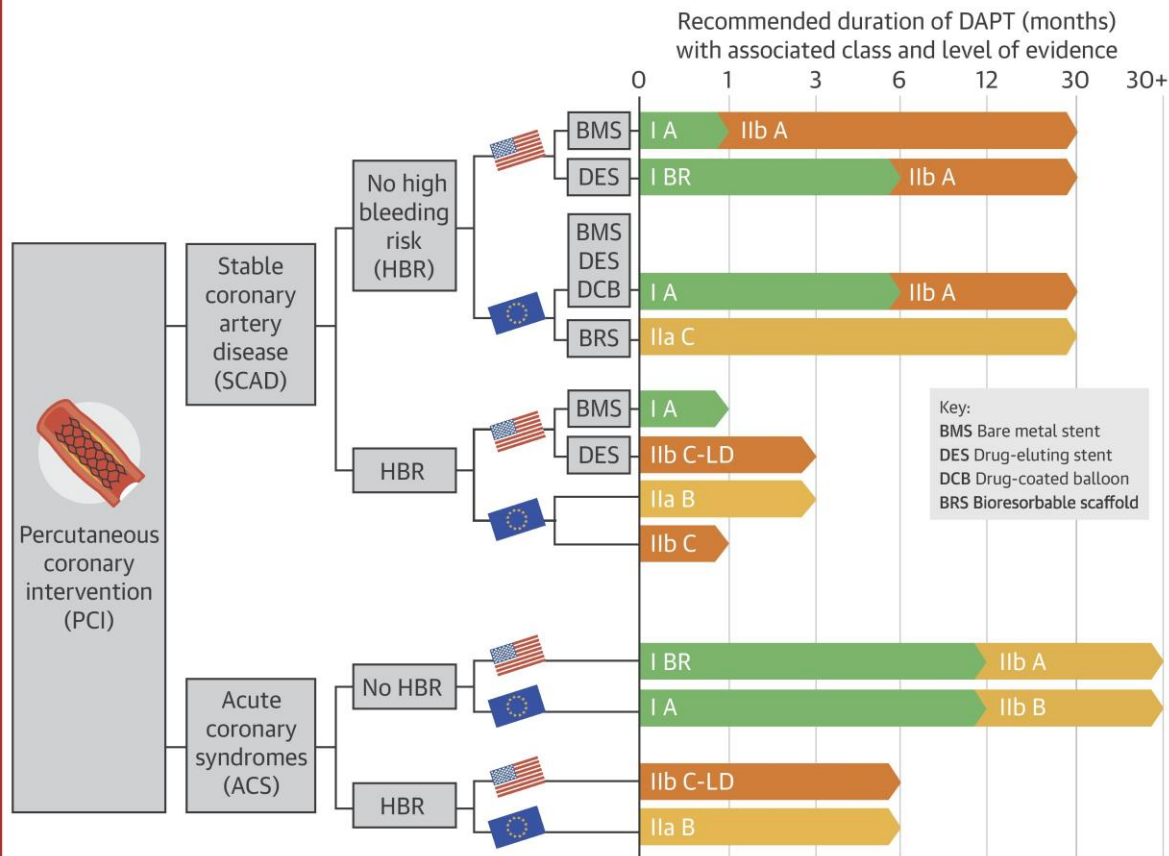
JW Pharmaceutical

# 2018 ESC/EACTS Guideline:

## Algorithm for the use of antithrombotic drugs in patients undergoing PCI



## CENTRAL ILLUSTRATION: Recommendations for Dual Antiplatelet Therapy in Patients Undergoing Percutaneous Coronary Intervention



Capodanno, D. et al. J Am Coll Cardiol. 2018;72(23PA):2915-31.

# Background

After due duration of DAPT, the comparative efficacy and safety of monotherapy with an oral P2Y<sub>12</sub> receptor inhibitor or aspirin remains incompletely understood in patients with established coronary artery disease and current guidelines recommend aspirin as first line treatment after DAPT cessation.

Post-interventional and maintenance treatment		
Life-long single antiplatelet therapy, usually aspirin, is recommended. <sup>681,683</sup>	I	A
Instruction of patients about the importance of complying with antiplatelet therapy is recommended.	I	C
In patients with SCAD treated with coronary stent implantation, DAPT consisting of clopidogrel in addition to aspirin is generally recommended for 6 months, irrespective of the stent type. <sup>c 690-694</sup>	I	A
In patients with SCAD treated with BRS, DAPT should be considered for at least 12 months and up to the presumed full absorption of the BRS, based on an individual assessment of bleeding and ischaemic risk.	IIa	C

# Study Design and Patient Population

- **5,530 eligible patients** screened, from 37 centers in Korea



## ✓ Key criterias

Patients who recieved PCI with a drug-eluting stent (DES) and maintained DAPT without any clinical event during  $12 \pm 6$  months after PCI.

No exclusion criteria of the clinical risk factors / clinical diagnosis / complexity of the PCI

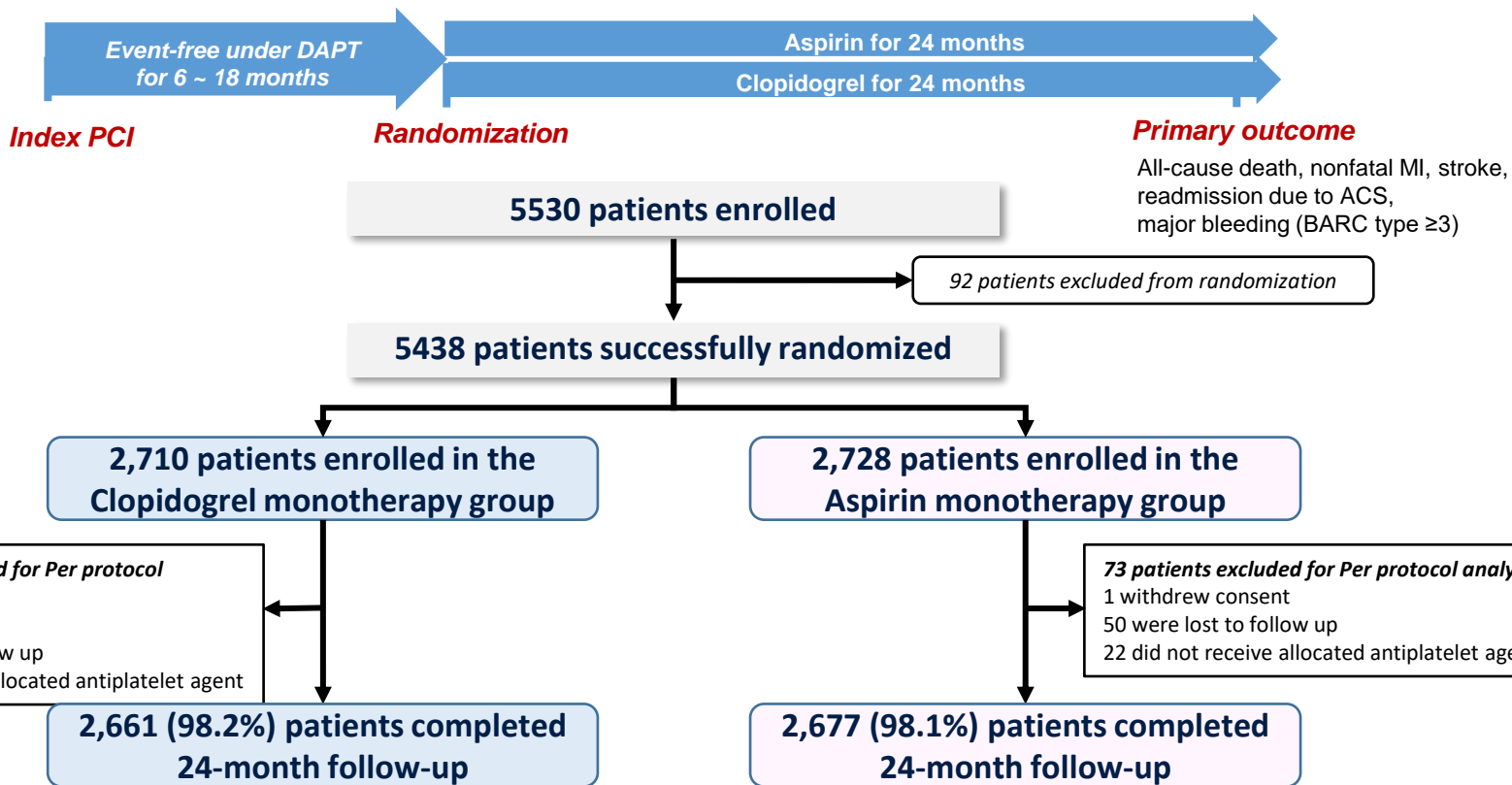
## Inclusion Criteria

- Subject must be  $\geq 20$  years
- Maintenance of DAPT for at least  $12 \pm 6$  months after PCI with DES
- No history of clinical event after PCI with DES before enrollment
- Agreement to give written informed consent

## Exclusion Criteria

- Known hypersensitivity or **contraindication** to key **medications**
- Patients with **active** pathologic **bleeding**
- Female of **childbearing** potential, unless a pregnancy test is negative
- History of bleeding diathesis, known **coagulopathy**
- Non-cardiac co-morbid conditions with **life expectancy**  $< 1$  year

# Trial Flow



# Primary Outcome

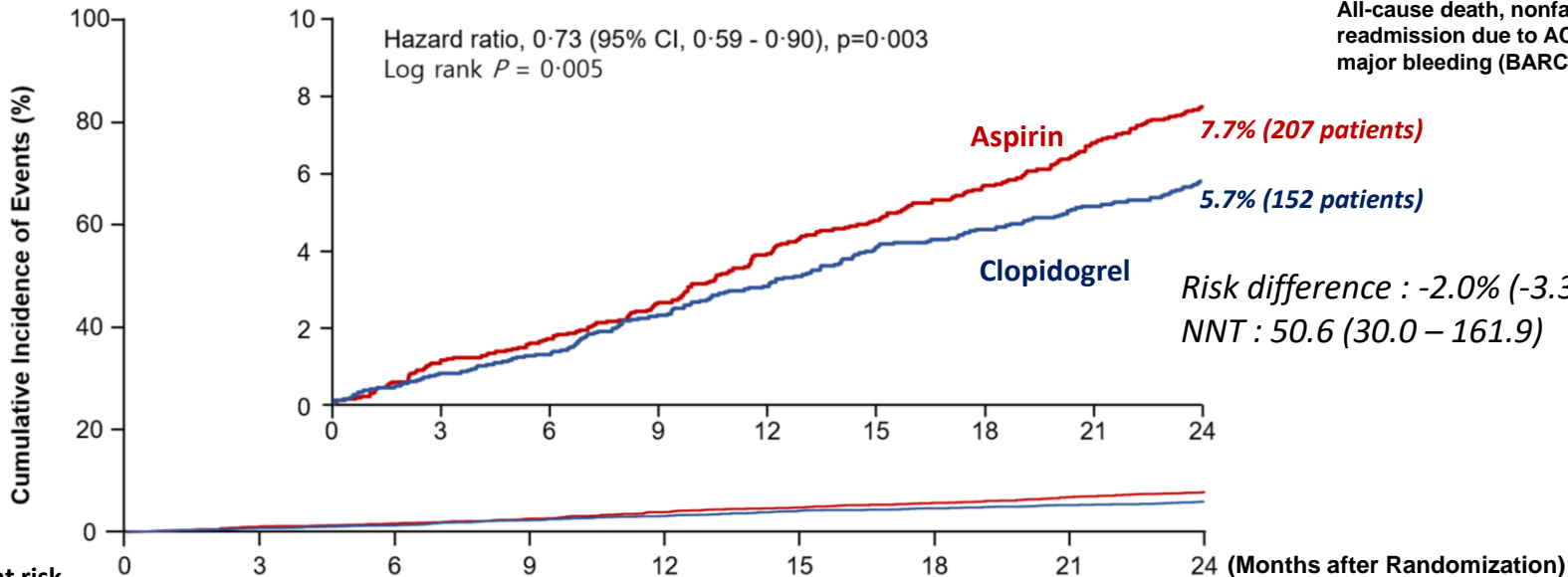


**Index PCI**

**Randomization**

**Primary outcome**

All-cause death, nonfatal MI, stroke, readmission due to ACS, major bleeding (BARC type  $\geq 3$ )



Number at risk

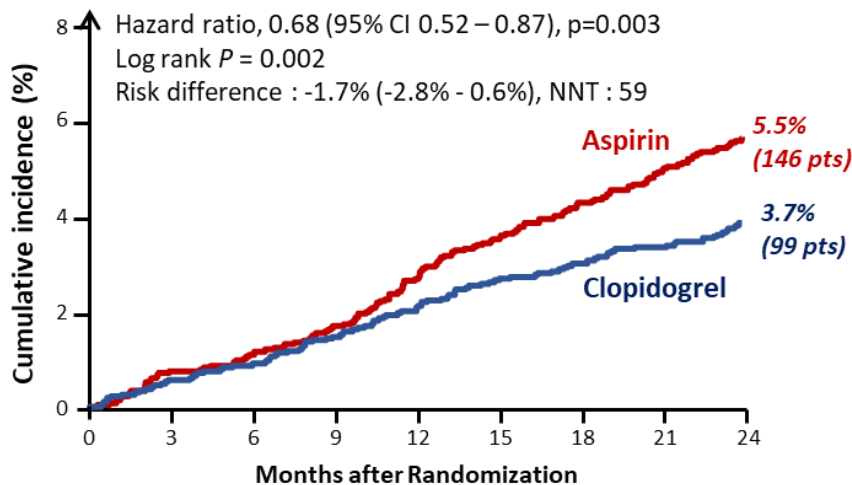
	0	3	6	9	12	15	18	21	24
<b>Clopidogrel</b>	2710	2667	2654	2626	2597	2565	2549	2521	2500
<b>Aspirin</b>	2728	2667	2657	2629	2585	2555	2531	2493	2456



# Secondary Outcomes

## Thrombotic composite outcome

(cardiac death, non-fatal MI, ischemic stroke, readmission due to ACS, and definite or probable stent thrombosis)

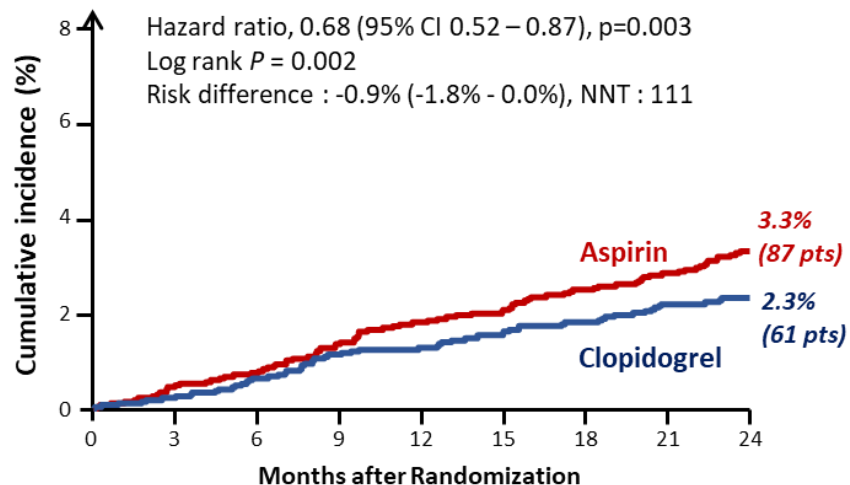


### Number at risk

Clopidogrel	2710	2661	2612	2569	2524
Aspirin	2728	2670	2608	2557	2495

## Any bleeding

(BARC type  $\geq 2$  bleeding)



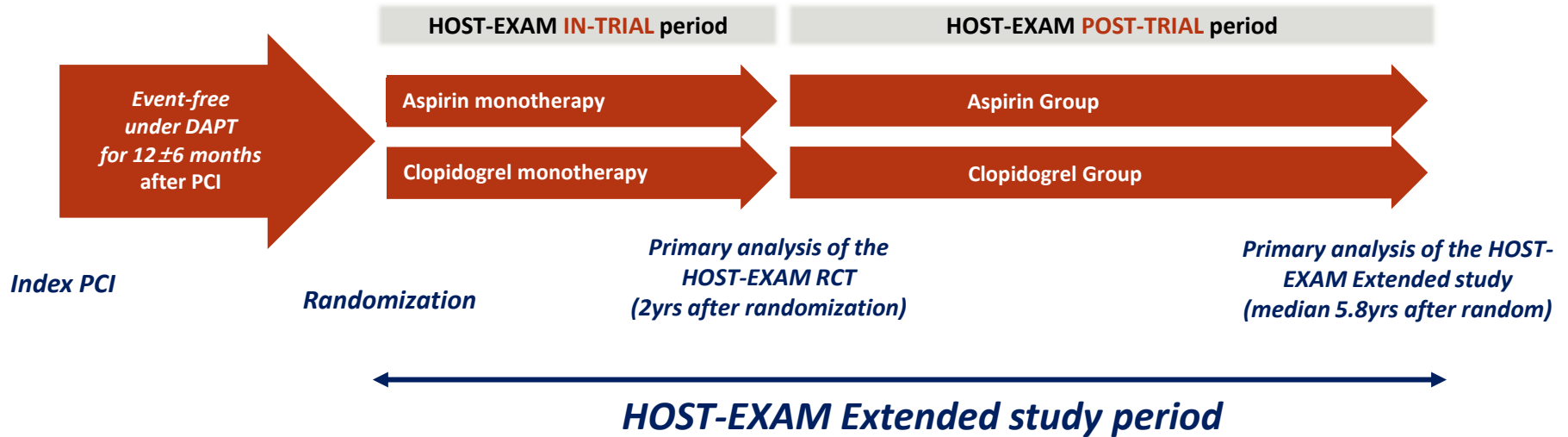
Clopidogrel	2710	2664	2621	2585	2542
Aspirin	2728	2677	2626	2595	2547

# Component of Outcomes for 2 years

	Clopidogrel (n=2710)	Aspirin (n=2728)	Hazard Ratio (95% CI)	P value
	No. of patients (%)			
All-cause death	1.9% (51)	1.3% (36)	1.43 (0.93-2.19)	0.101
Cardiac death	0.7% (19)	0.5% (14)	1.37 (0.69-2.73)	0.374
Non-cardiac death	1.2% (32)	0.8% (22)	1.47 (0.85-2.52)	0.167
Non-fatal myocardial infarction	0.7% (18)	1.0% (28)	0.65 (0.36-1.17)	0.150
Stroke	0.7% (18)	1.6% (43)	0.42 (0.24-0.73)	0.002
Ischemic stroke	0.5% (14)	1.0% (26)	0.54 (0.28-1.04)	0.064
Hemorrhagic stroke	0.2% (4)	0.6% (17)	0.24 (0.08-0.70)	0.010
Readmission due to ACS	2.5% (66)	4.1% (109)	0.61 (0.45-0.82)	0.001
Major bleeding (BARC type ≥3)	1.2% (33)	2.0% (53)	0.63 (0.41-0.97)	0.035
Any revascularization	2.1% (56)	2.6% (69)	0.82 (0.57-1.16)	0.261
Target lesion revascularization	0.9% (24)	1.4% (36)	0.67 (0.40-1.12)	0.130
Target vessel revascularization	1.4% (37)	1.8% (48)	0.78 (0.50-1.19)	0.245
Definite or probable stent thrombosis	0.4% (10)	0.6% (16)	0.63 (0.29-1.39)	0.251
Any minor GI complications	10.2% (272)	11.9% (320)	0.85 (0.72-1.00)	0.048

# Study Design and Patient Population

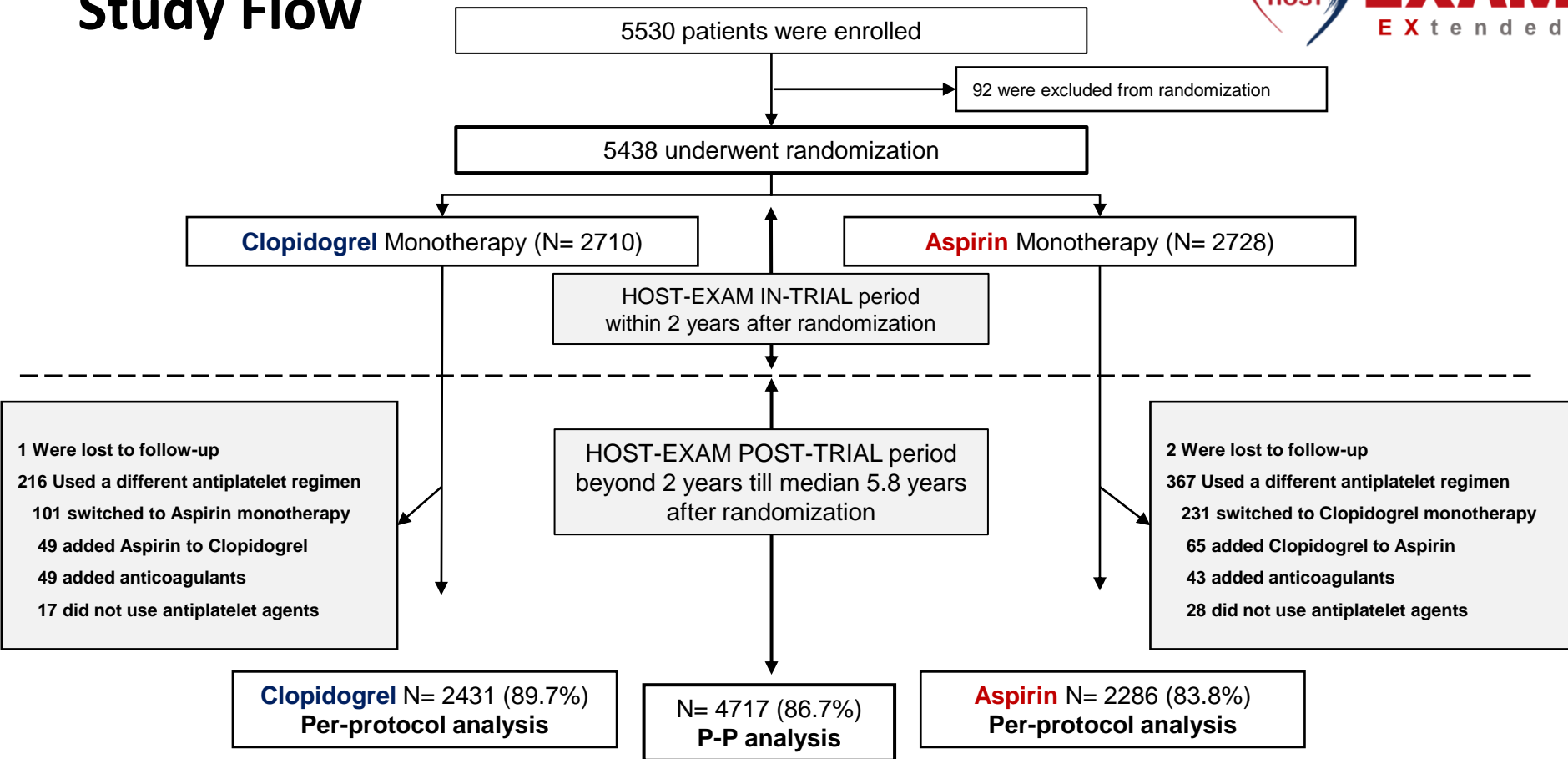
- 5,530 eligible patients screened, from 37 centers in Korea



Clinical events and final clinical status ascertained at March, 2022.

The vital status of all patients cross-checked via the National Health Insurance Service system.

# Study Flow

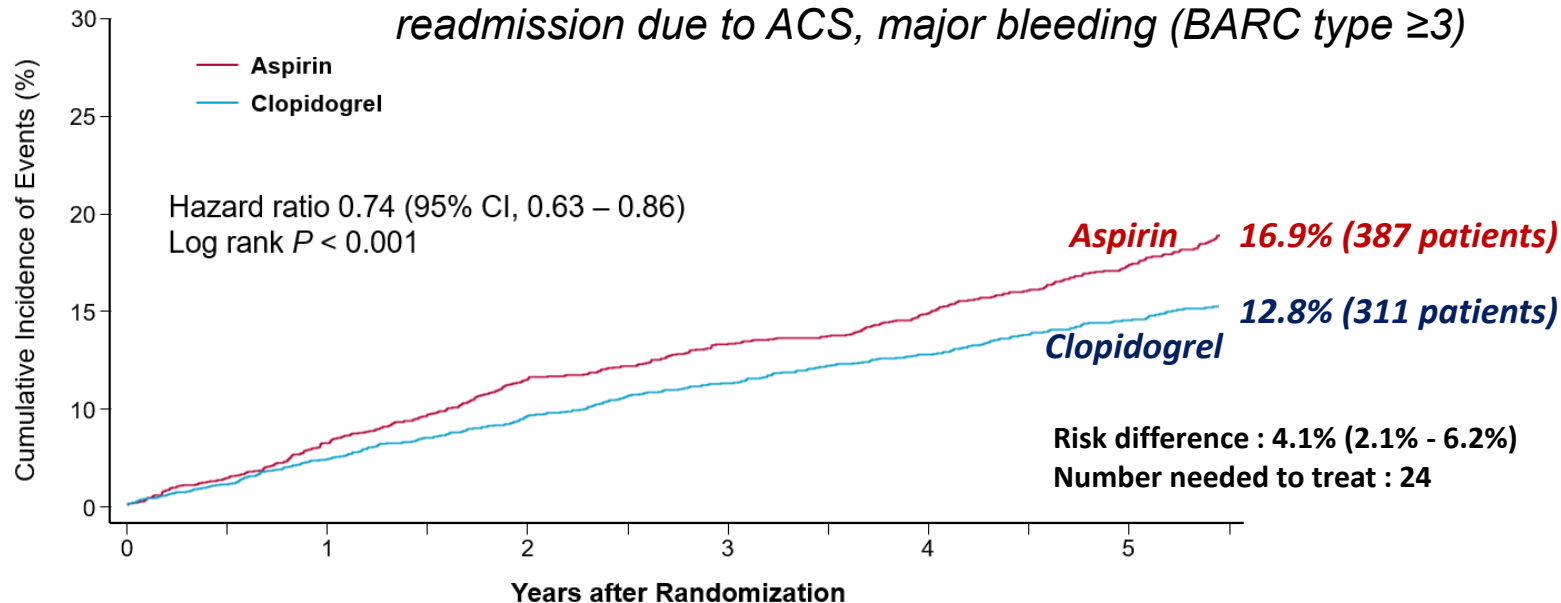


# Clinical Outcomes

## Primary Endpoint



**Primary endpoint:** All-cause death, nonfatal MI, stroke, readmission due to ACS, major bleeding (BARC type  $\geq 3$ )



### Number at Risk

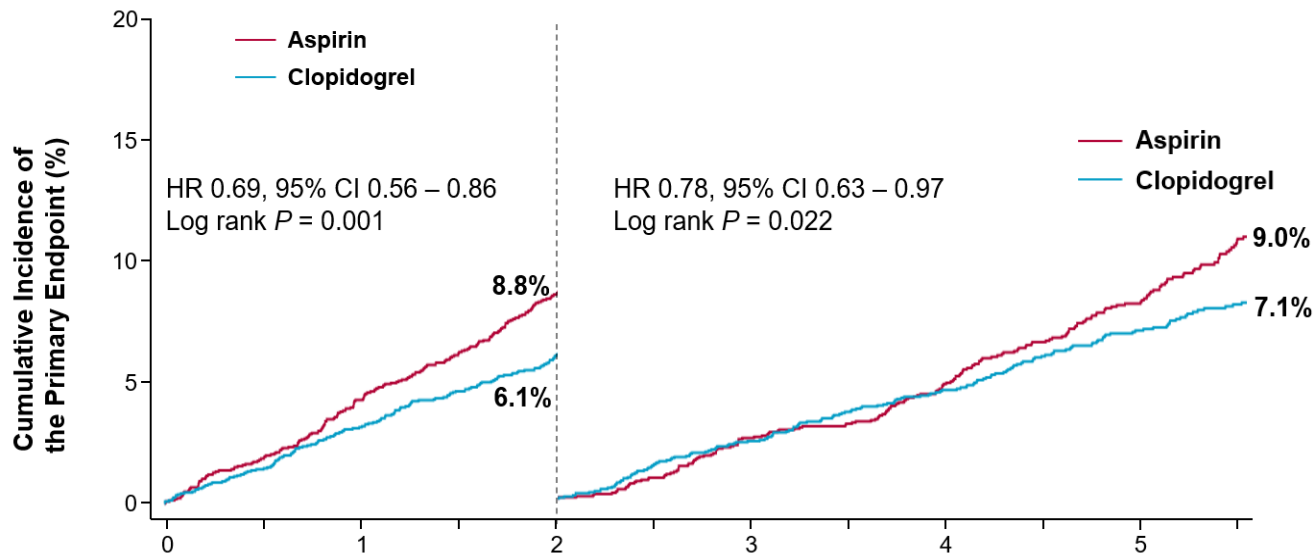
Aspirin	2286	2189	2086	2014	1777	1287	1007
Clopidogrel	2431	2355	2280	2214	1964	1462	1181

# Clinical Outcomes

## Landmark analysis of the Primary Endpoint



Consistent beneficial effects both in the In-trial period and post-trial period



	Years after Randomization						
Number at Risk	0	1	2	3	4	5	6
Aspirin	2286	2189	2086	2014	1777	1287	1007
Clopidogrel	2431	2355	2280	2214	1964	1462	1181

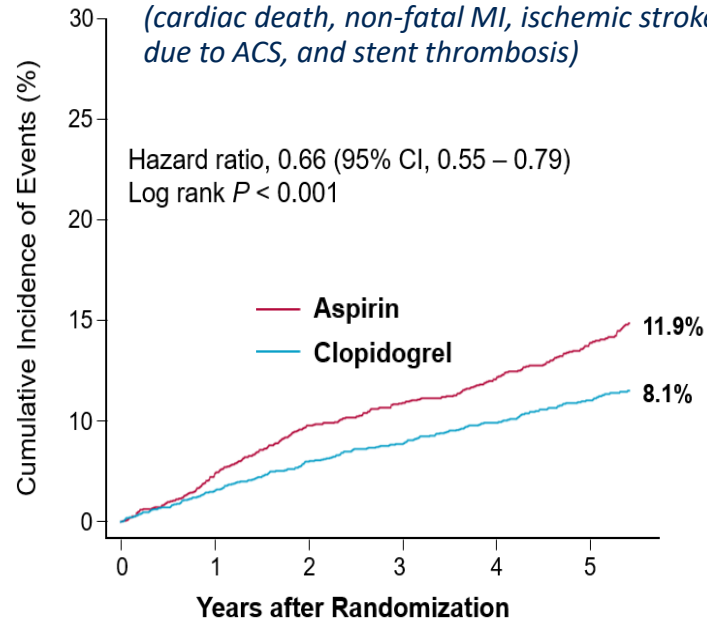
# Clinical Outcomes

## ■ Secondary Endpoints



### Thrombotic composite outcome

(cardiac death, non-fatal MI, ischemic stroke, readmission due to ACS, and stent thrombosis)

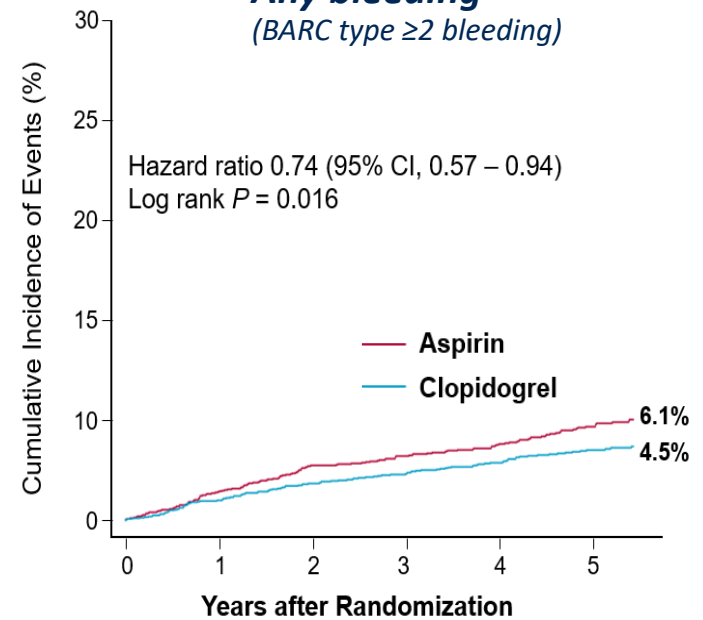


#### Number at Risk

Aspirin	2286	2120	1819	1040
Clopidogrel	2431	2304	1992	1202

### Any bleeding

(BARC type  $\geq 2$  bleeding)

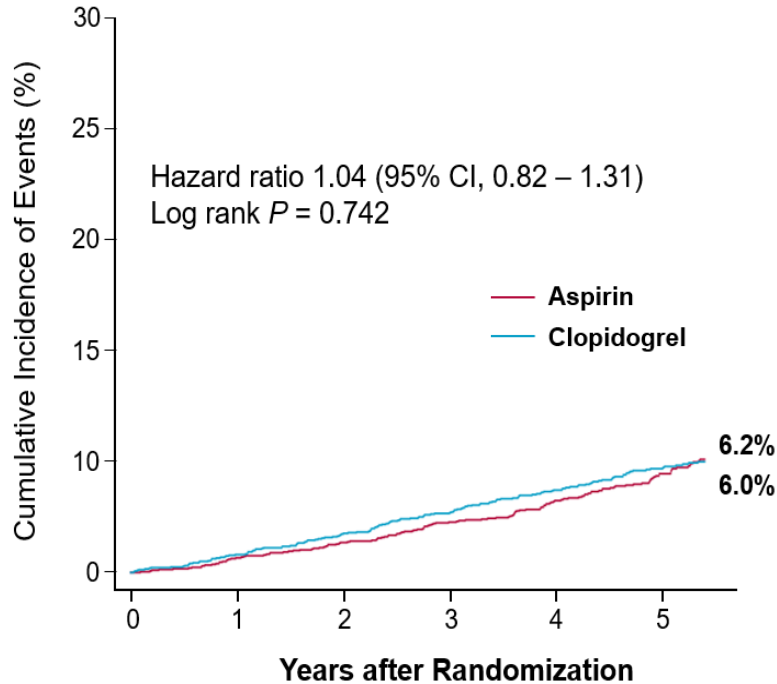


#### Number at Risk

Aspirin	2286	2175	1888	1104
Clopidogrel	2431	2323	2028	1238

# Clinical Outcomes

## ■ Mortality

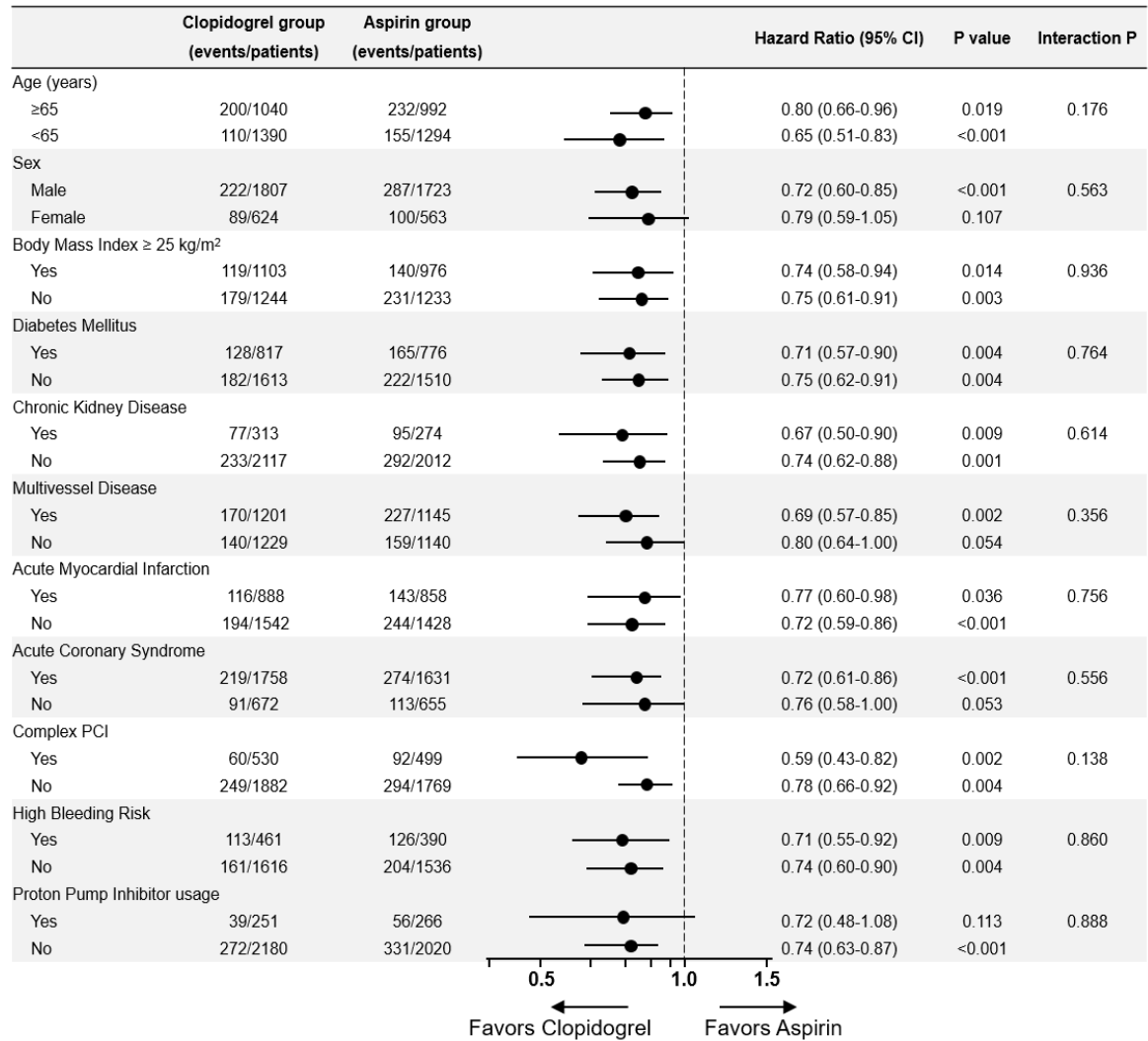


No. of patients	Clopidogrel (N=2431)	Aspirin (N=2286)	P value
<b>Total mortality</b>	<b>150 (6.2%)</b>	<b>136 (6.0%)</b>	<b>0.753</b>
<b>Cardiovascular cause</b>	<b>69 (2.8%)</b>	<b>71 (3.1%)</b>	<b>0.587</b>
Cardiac arrest	21	22	
Heart failure aggravation	5	3	
Cerebrovascular accident	7	3	
Unknown origin of death	36	43	
<b>Non-cardiovascular cause</b>	<b>81 (3.3%)</b>	<b>65 (2.8%)</b>	<b>0.334</b>
<b>Malignancy</b>	<b>34</b>	<b>29</b>	
- Gastrointestinal origin	15	12	
- Respiratory origin	8	11	
- Endocrinology origin	1	1	
- Genitourinary origin	4	3	
- Other	3	2	
- Unknown primary	3	0	
<b>Infectious disease</b>	<b>4</b>	<b>5</b>	
<b>Suicide or Trauma</b>	<b>8</b>	<b>3</b>	
<b>Others</b>	<b>20</b>	<b>16</b>	

### Number at Risk

	0	1	2	3	4	5
Aspirin	2286	2244	1971	1165		
Clopidogrel	2431	2374	2088	1285		

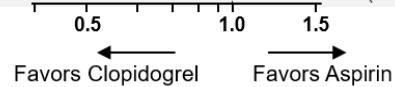




# Subgroup Analysis

No significant interaction between the treatment effect and subgroups

Kang J, Park KW, Koo BK, Kim HS et al. Circulation 2023

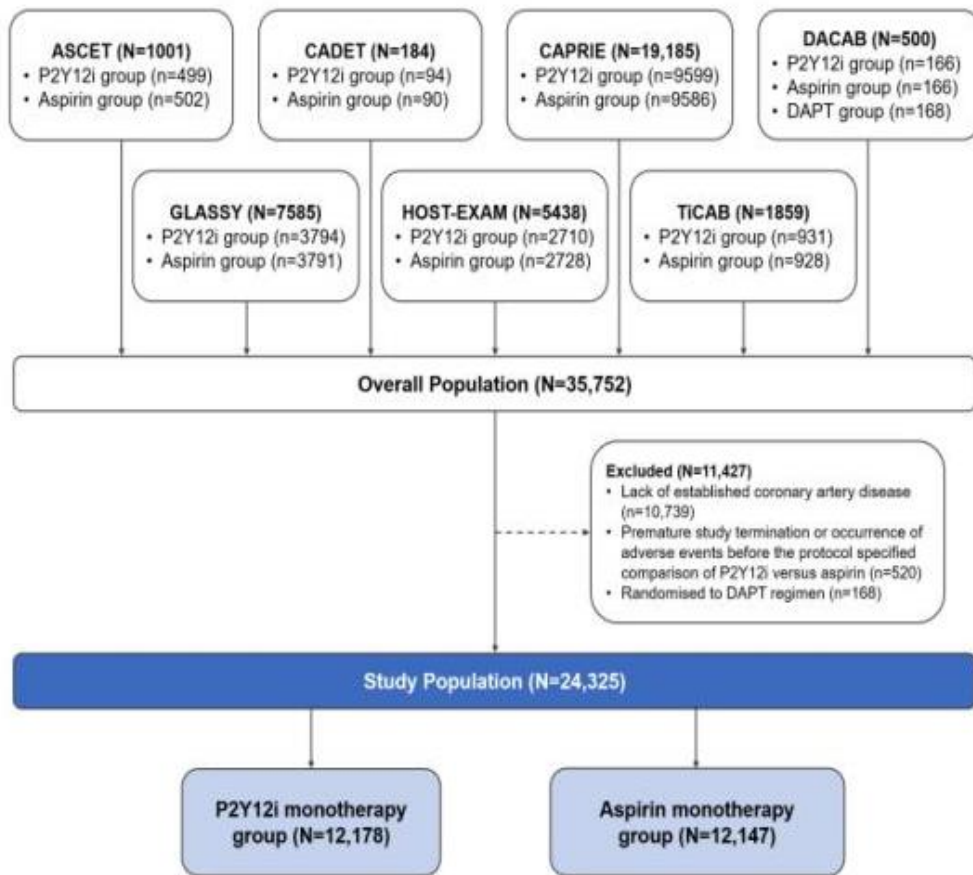


# The PANTHER Collaboration

- RCTs comparing monotherapy with oral P2Y12 inhibitor (i.e., clopidogrel, prasugrel, or ticagrelor) or aspirin for secondary prevention of adjudicated events in patients with established CAD w/o indication for OAC.

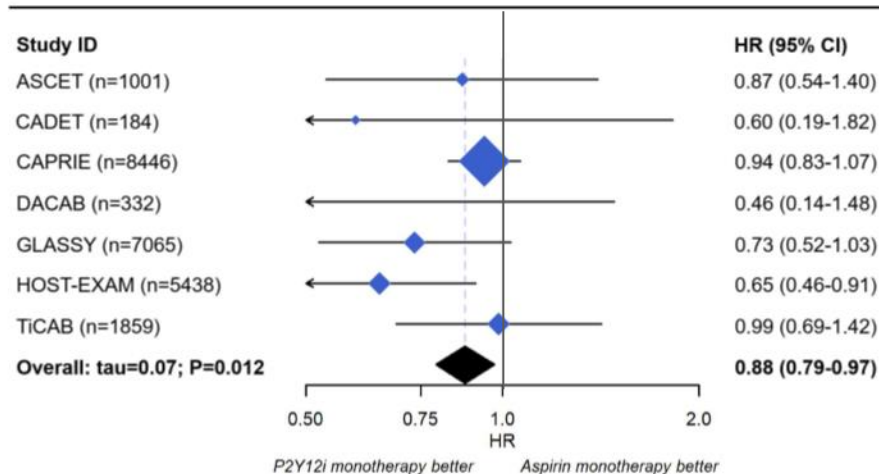
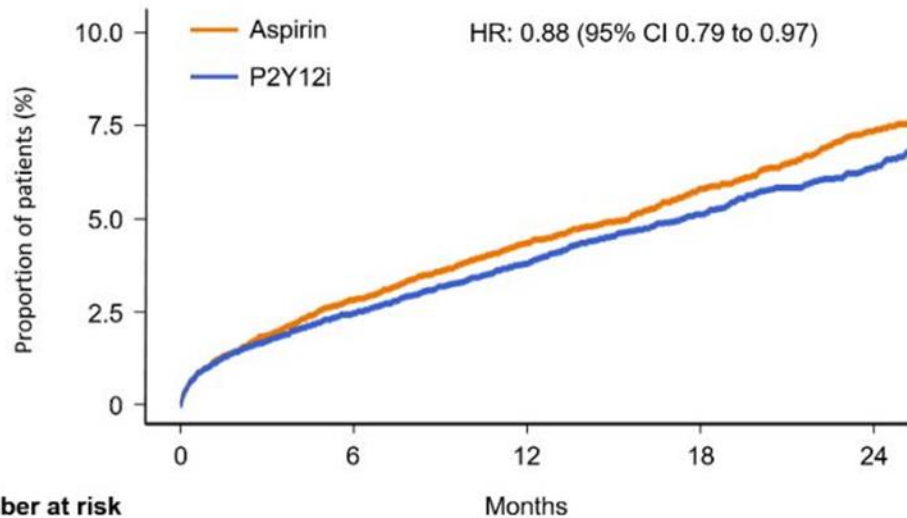
- 7 studies identified

- **PROSPERO** registration  
([www.crd.york.ac.uk/prospéro](http://www.crd.york.ac.uk/prospéro),  
CRD42021290774)



# Primary Efficacy Outcome: CV death, MI, stroke

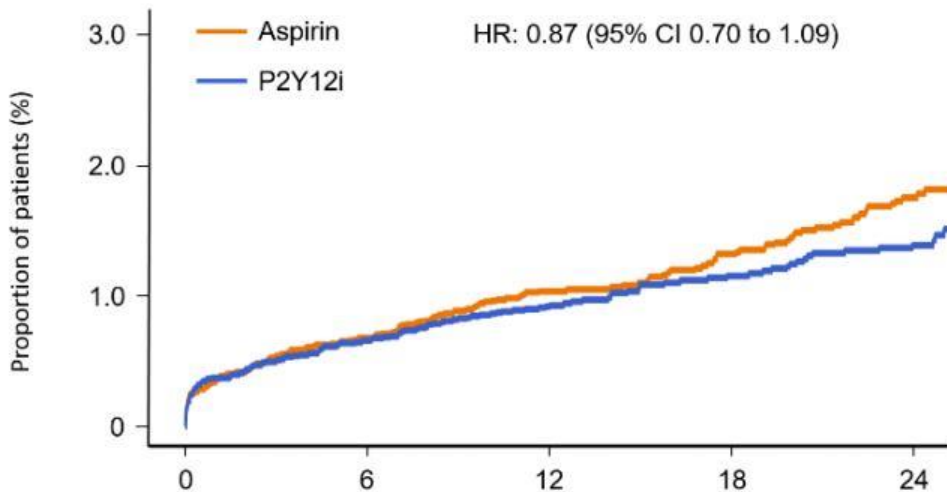
CV death, MI or stroke: 5.5% vs. 6.3%; HR 0.88, 95% CI 0.79 to 0.97, P=0.014; NNTB: 123



	0	6	12	18	24
Aspirin	11645	11143	10141	5405	4288
P2Y12i	11679	11196	10142	5389	4357

# Primary Safety Outcome: Major Bleeding

Major bleeding: 1.2% vs. 1.4%; HR 0.87, 95% CI 0.70 to 1.09, P=0.23



Number at risk

Months

Aspirin	11479	11127	10220	5562	4430
P2Y12i	11513	11149	10179	5530	4459

## Major bleeding

ASCET (n=1,001)

CADET (n=184)

CAPRIE (n=8,446)

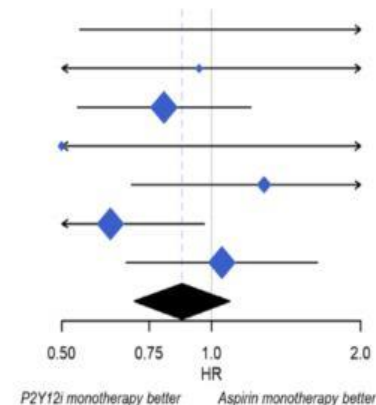
DACAB (n=332)

GLASSY (n=7,065)

HOST-EXAM (n=5,438)

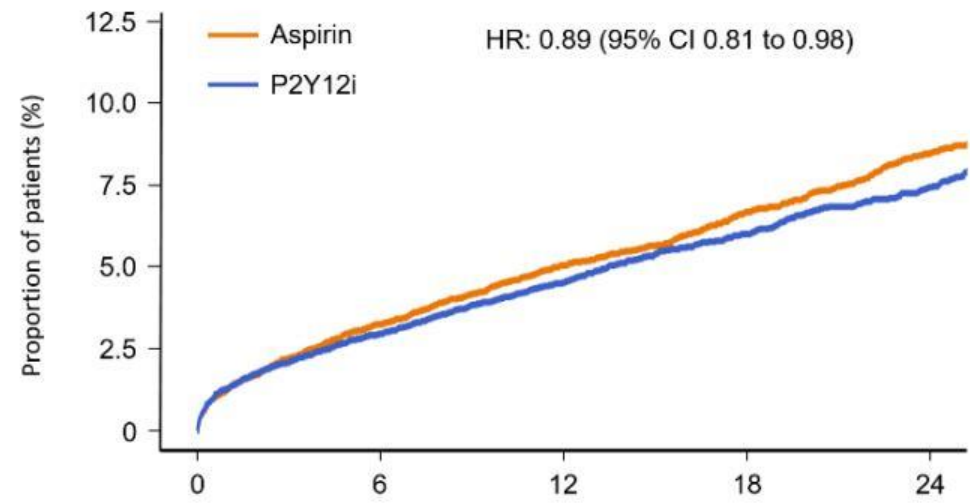
TICAB (n=1,859)

Overall: tau = 0.040; P = 0.229



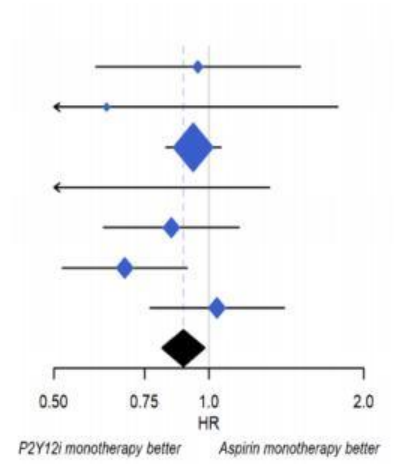
# Key Secondary Outcome: Net Adverse Clinical Events

**NACE: 6.4% vs. 7.2%; HR 0.89, 95% CI 0.81 to 0.98, P=0.02**



### Net adverse clinical events

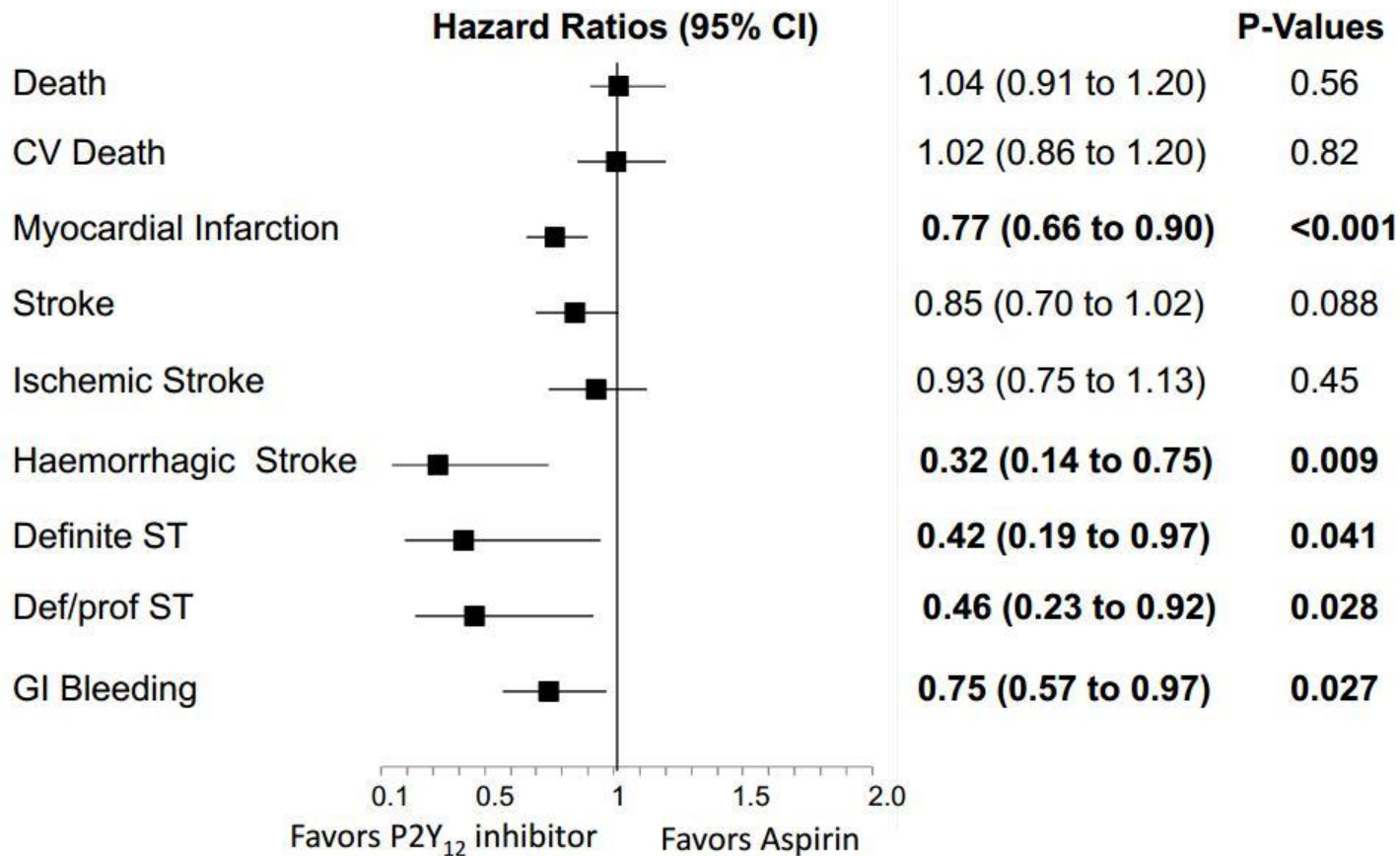
- ASCET (n=1,001)
- CADET (n=184)
- CAPRIE (n=8,446)
- DACAB (n=332)
- GLASSY (n=7,065)
- HOST-EXAM (n=5,438)
- TICAB (n=1,859)
- Overall: tau = 0.008; P = 0.020



### Number at risk

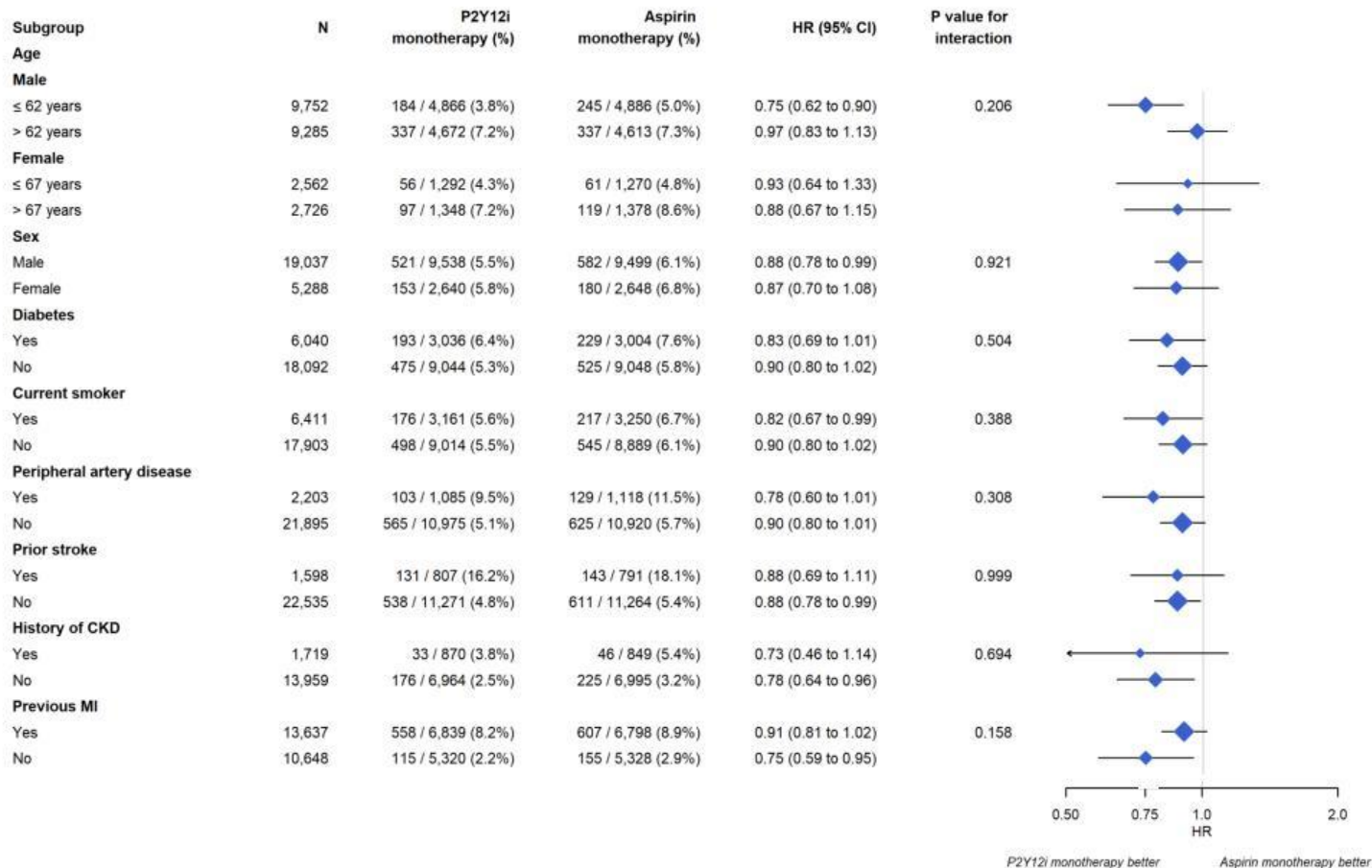
	0	6	12	18	24
Aspirin	11479	10935	9949	5363	4244
P2Y12i	11513	10987	9959	5354	4323

# Secondary Outcomes

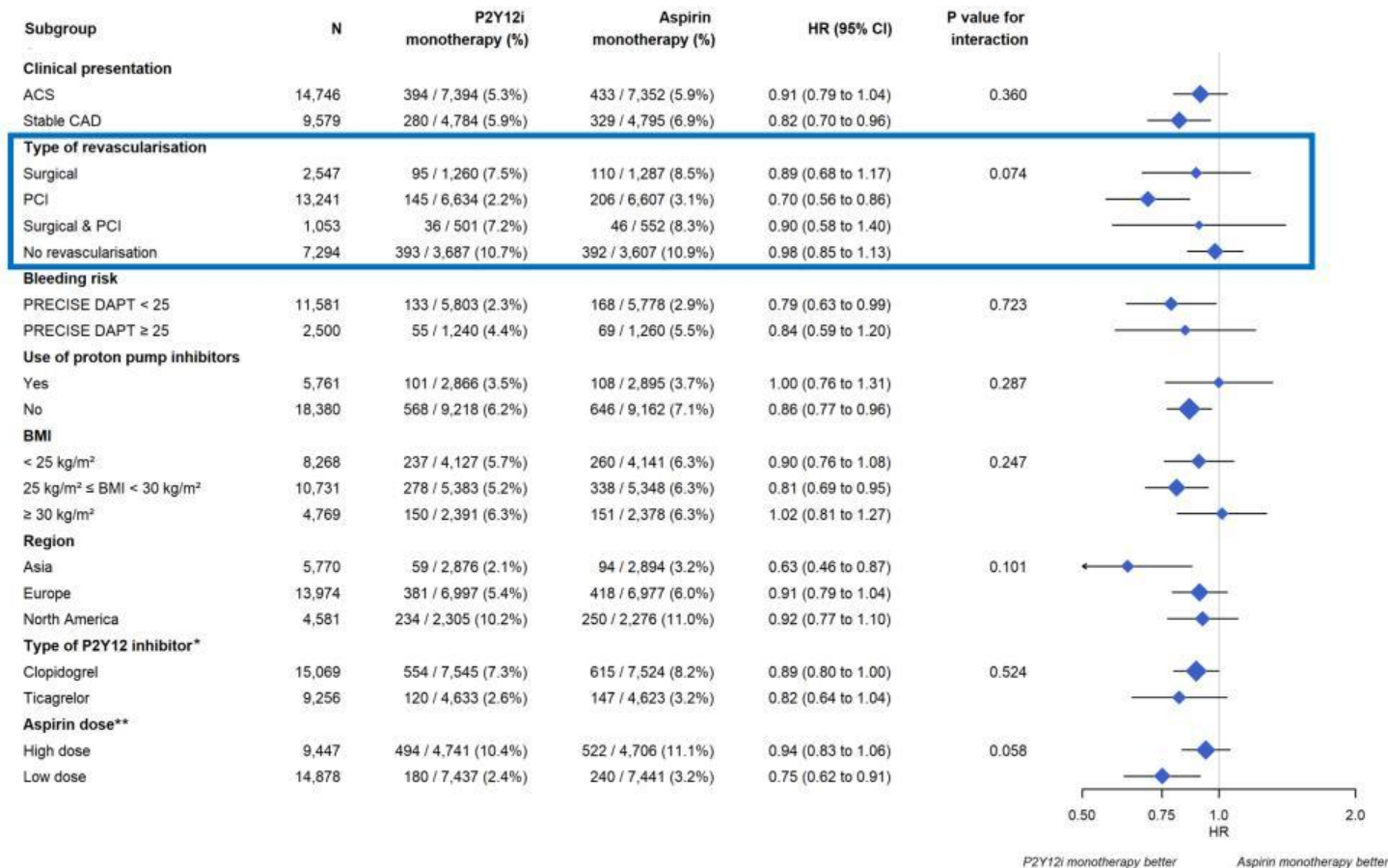




# Primary Efficacy Outcome: subgroup analysis



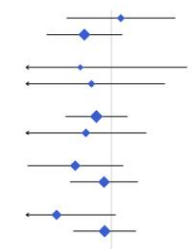
# Primary Efficacy Outcome: subgroup analysis (ii)





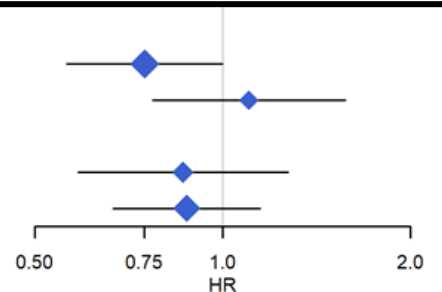
# Subgroup Analysis for Major Bleeding

Subgroup	N	P2Y12 monotherapy (%)	Aspirin monotherapy (%)	HR (95% CI)	P value for interaction
<b>Age</b>					
Male					
≤ 62 years	9,752	42 / 4,866 (0.9%)	38 / 4,866 (0.8%)	1.08 (0.70 to 1.68)	0.713
> 62 years	9,285	75 / 4,672 (1.6%)	93 / 4,613 (2.0%)	0.80 (0.59 to 1.09)	
Female					
≤ 67 years	2,562	9 / 1,292 (0.7%)	12 / 1,270 (0.9%)	0.78 (0.33 to 1.85)	0.781
> 67 years	2,726	20 / 1,348 (1.5%)	24 / 1,378 (1.7%)	0.85 (0.47 to 1.54)	
<b>Sex</b>					
Male	19,037	117 / 9,538 (1.2%)	131 / 9,499 (1.4%)	0.89 (0.69 to 1.14)	0.781
Female	5,288	29 / 2,640 (1.1%)	36 / 2,648 (1.4%)	0.81 (0.50 to 1.33)	
<b>Diabetes</b>					
Yes	6,040	45 / 3,036 (1.5%)	60 / 3,004 (2.0%)	0.75 (0.51 to 1.10)	0.330
No	18,092	100 / 9,044 (1.1%)	106 / 9,048 (1.2%)	0.94 (0.72 to 1.24)	
<b>Current smoker</b>					
Yes	6,411	28 / 3,161 (0.9%)	43 / 3,250 (1.3%)	0.64 (0.40 to 1.03)	0.166
No	17,903	118 / 9,014 (1.3%)	124 / 8,889 (1.4%)	0.95 (0.74 to 1.22)	
<b>Peripheral artery disease</b>					

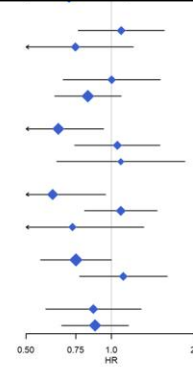


## Type of P2Y12 inhibitor\*

Clopidogrel	15,069	82 / 7,545 (1.1%)	109 / 7,524 (1.4%)	0.75 (0.56 to 1.00)	0.098
Ticagrelor	9,256	64 / 4,633 (1.4%)	58 / 4,623 (1.3%)	1.10 (0.77 to 1.57)	
<b>Aspirin dose**</b>					
High dose	9,447	48 / 4,741 (1.0%)	55 / 4,706 (1.2%)	0.87 (0.59 to 1.27)	0.958
Low dose	14,878	98 / 7,437 (1.3%)	112 / 7,441 (1.5%)	0.88 (0.67 to 1.15)	



<b>Bleeding risk</b>					
PRECISE DAPT < 25	11,581	66 / 5,803 (1.1%)	60 / 5,778 (1.0%)	1.08 (0.76 to 1.54)	0.229
PRECISE DAPT ≥ 25	2,500	30 / 1,240 (2.4%)	42 / 1,260 (3.3%)	0.75 (0.47 to 1.19)	
<b>Use of proton pump inhibitors</b>					
Yes	5,761	49 / 2,866 (1.7%)	50 / 2,895 (1.7%)	1.00 (0.68 to 1.49)	0.478
No	18,380	96 / 9,218 (1.0%)	116 / 9,162 (1.3%)	0.83 (0.63 to 1.08)	
<b>BMI</b>					
< 25 kg/m <sup>2</sup>	8,268	47 / 4,127 (1.1%)	73 / 4,141 (1.8%)	0.65 (0.45 to 0.94)	0.120
25 kg/m <sup>2</sup> ≤ BMI < 30 kg/m <sup>2</sup>	10,731	66 / 5,383 (1.2%)	63 / 5,348 (1.2%)	1.05 (0.74 to 1.48)	
≥ 30 kg/m <sup>2</sup>	4,769	30 / 2,391 (1.3%)	27 / 2,378 (1.1%)	1.06 (0.64 to 1.82)	
<b>Region</b>					
Asia	5,770	34 / 2,876 (1.2%)	55 / 2,894 (1.9%)	0.62 (0.41 to 0.95)	0.089
Europe	13,974	92 / 6,997 (1.3%)	85 / 6,977 (1.2%)	1.06 (0.80 to 1.45)	
North America	4,581	20 / 2,305 (0.9%)	27 / 2,276 (1.2%)	0.73 (0.41 to 1.30)	
<b>Type of P2Y12 inhibitor*</b>					
Clopidogrel	15,069	82 / 7,545 (1.1%)	109 / 7,524 (1.4%)	0.75 (0.56 to 1.00)	0.098
Ticagrelor	9,256	64 / 4,633 (1.4%)	58 / 4,623 (1.3%)	1.10 (0.77 to 1.57)	
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# Summary and Conclusions (I)

- 1. HOST EXAM was the first study to compare clopidogrel vs aspirin for secondary prevention in a dedicated PCI population in the contemporary era of high intensity statin**
- 2. Clopidogrel was superior to aspirin for the composite of all-cause death, nonfatal MI, stroke, readmission due to ACS, and BARC type  $\geq 3$  bleeding.**
- 3. The benefit of clopidogrel was also observed for the thrombotic composite outcomes as well as any bleeding. Results were consistent in various subgroups**
- 4. Extended follow up (median 5.8yrs) of the HOST EXAM showed continued benefit of clopidogrel over aspirin with no differences in all-cause or cardiovascular mortality.**

## Summary and Conclusions (II)

5. The PANTHER IPD meta-analysis studied whether P2Y12 inhibitor or aspirin monotherapy should be the standard in chronic mx of CAD patients.
6. P2Y12 inhibitor monotherapy was associated with significantly lower rates of the composite of CV death, MI, stroke, mainly due to lower rates of MI, which resulted in a reduced risk of net adverse clinical events.
7. Major bleeding was similar but GI bleeding and hemorrhagic stroke were lower with P2Y12 inhibitor monotherapy.
8. Based on the HOST EXAM RCT and the PANTHER analysis, it may be reasonable to use clopidogrel over aspirin as chronic antiplatelet monotherapy in pts with stabilized CAD