



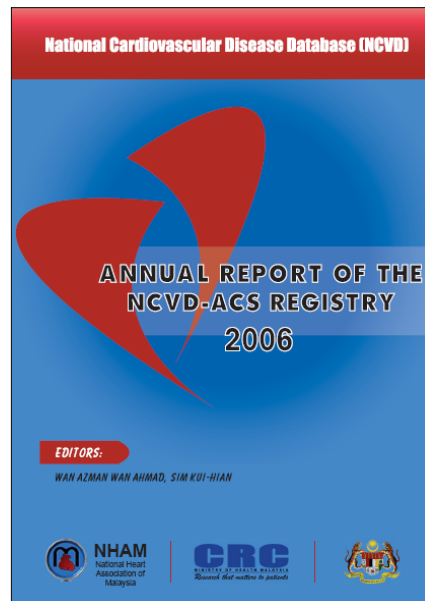
# NCVD-ACS REGISTRY



## NCVD-ACS Registry: Annual Report 2006

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Annual Report of the Acute Coronary  
Syndrome (ACS) Registry, Malaysia 2006

# Chapter 1: Provision of Acute Coronary Care Services in Malaysia

Annual Report of the Acute Coronary  
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Chapter 1:  
Provision of Acute Coronary Care Services in Malaysia

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In 2006, there were a total of 31186 admissions to the 73 coronary care units (CCU) in Malaysia, of which 12534 admissions were due to Acute Coronary Syndrome (ACS) (Table 1). The incidence of ACS admission was therefore 47.1 per 100,000 population in 2006. Assuming half of all coronary heart disease (CHD) first presented with ACS and only half were admitted to CCU with a third who died before being admitted into hospital, a rough estimate of the incidence of CHD in Malaysia is 141 per 100,000 population.

- In **2006**, there are **73** coronary care units (**CCU**) in Malaysia
- The **incidence of ACS admission** was therefore **47.1 per 100,000 population in 2006**
- The **estimate of the incidence of coronary heart disease (CHD)** in Malaysia is **141 per 100,000 population**
- Over 4000 ACS being denied admission into its CCU in 2006. It has **30% shortfall in CCU beds**

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## Acute Coronary/ Cardiac Care Services and Admissions in Malaysia 2006

	CCU	Cardiologist	CCU nurses	Cath. Lab	Cardiac surgical service	ACS admission
	N(%)	N(%)	N(%)	N(%)	N(%)	N(%)
<b>Malaysia</b>	73(100)	163(100)	559(100)	36(100)	27(100)	12,534(100)
<b>By Sector</b>						
<b>Private</b>	32(44)	81(50)	176(31)	28(78)	20(74)	3,398(27)
<b>MOH</b>	37(51)	37(23)	305(55)	4(11)	4(15)	7,580(60)
<b>IJN</b>	1(1)	27(17)	13(2)	1(3)	1(4)	335(3)
<b>University</b>	3(4)	17(10)	65(12)	3(8)	2(7)	1,221(10)

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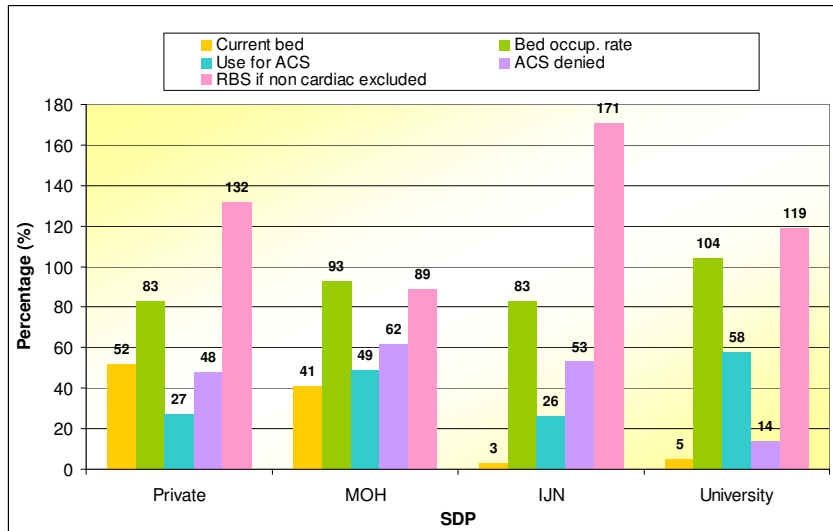
## Utilization of Acute Coronary / Cardiac Services in Malaysia 2006

	Current CCU beds	Bed occupancy rate	Use for all acute	Use for ACS	Use for non cardiac	ACS denied	*RBS if non cardiac excluded
	N(%)	%	%	%	%	% of all ACS	(% shortfall)
<b>Malaysia</b>	414(100)	89	65	40	35		
<b>Sectors</b>							
<b>Private</b>	214(52)	83	51	27	49	48	132
<b>MOH</b>	169(41)	93	77	49	23	62	89
<b>IJN</b>	12(3)	83	36	26	64	53	171
<b>University</b>	19(5)	104	76	58	24	14	119

*\*RBS – Required bed strength*

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### Utilization of Acute Coronary / Cardiac Services by Sectors in Malaysia 2006



\*RBS – Required bed strength

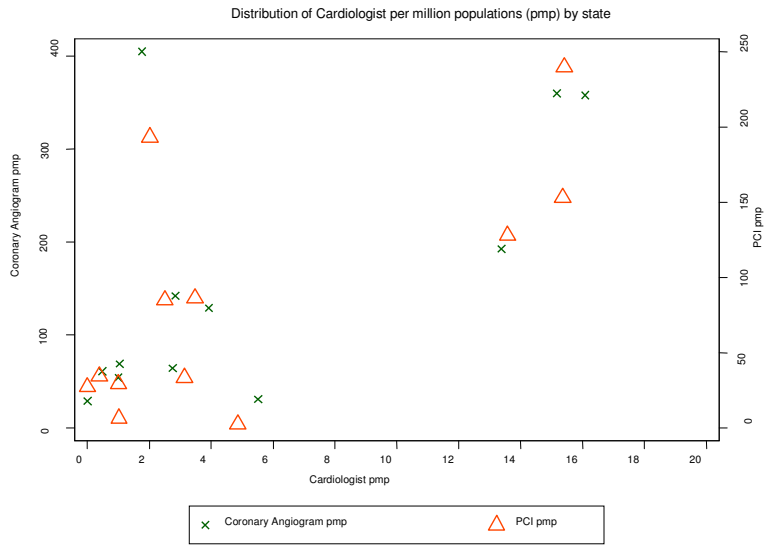
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### Cardiac Care provided for ACS in Malaysia 2006

	ACS admits	Thrombolytic	Angiogram	PCI	CABG
	%	%	%	%	%
<b>Malaysia</b>	100	38	33	20	7
<b>Sector</b>					
<b>Private</b>	27	25	64	43	16
<b>MOH</b>	60	44	19	11	3
<b>IJN</b>	3	59	77	40	12
<b>University</b>	10	30	27	11	2

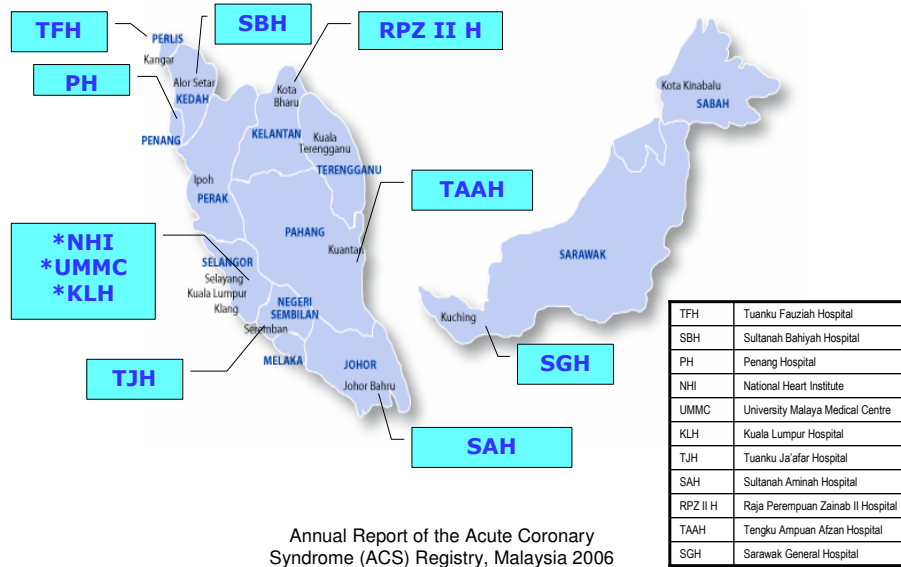
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**Relationship between availability of cardiologist and provision of emergency Coronary angiogram and Percutaneous Coronary Intervention (PCI) for patients admitted with ACS in Malaysia 2006**



Sample Size = 3422 patients registered in year 2006

## NCVD-ACS Registry Participating Sites in 2006



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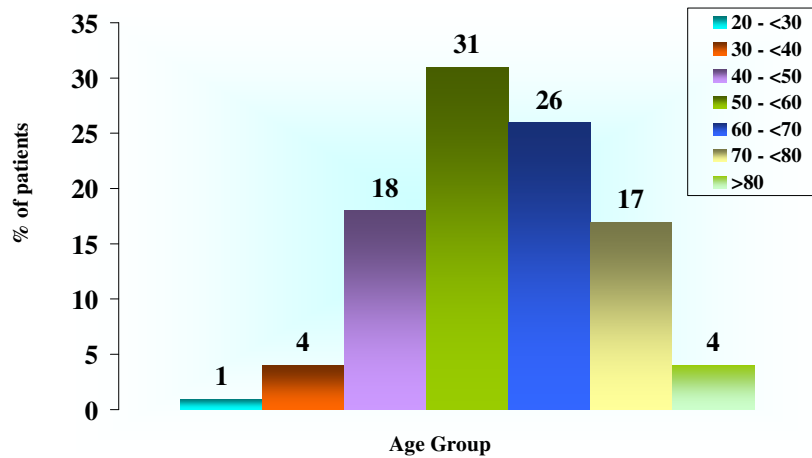
## Chapter 2: Patient Characteristics

## Age Group for patient with ACS, Malaysia 2006

Age group, no. % (N = 3422)	
20 - <30	23 (1)
30 - <40	143 (4)
40 - <50	621 (18)
50 - <60	1054 (31)
60 - <70	881 (26)
70 - <80	571 (17)
≥80	129 (4)

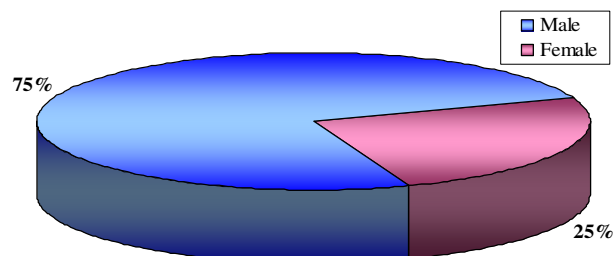
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## Age Group for patient with ACS, Malaysia 2006



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### Gender distribution for patients with ACS, Malaysia 2006



Gender, no. % (N=3422)	
Male	2569(75)
Female	853 (25)

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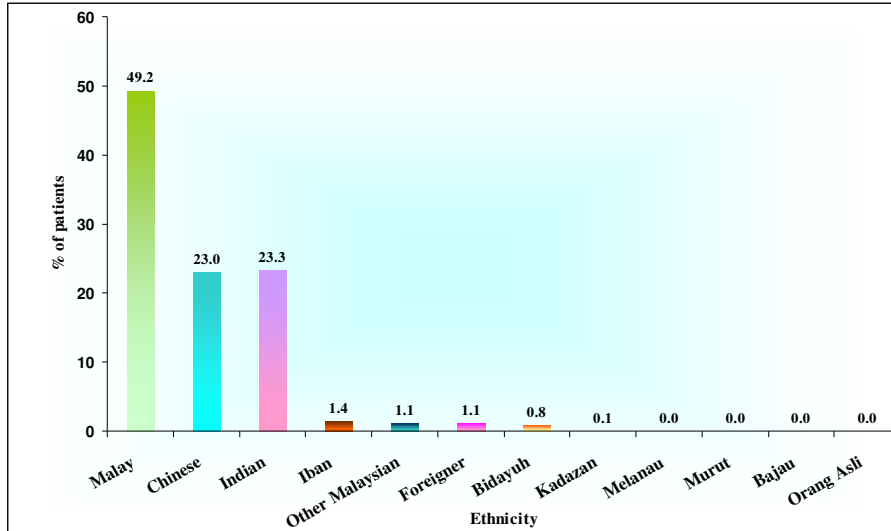
### Ethnic group distribution for patients with ACS, Malaysia 2006

Ethnic group, no. % (N= 3422)	
Malay	1684 (49)
Chinese	786 (23)
Indian	799 (23)
Orang Asli	0 (0)
Kadazan	2 (0)
Melanau	0 (0)
Murut	0 (0)
Bajau	1 (0)
Bidayuh	28 (1)
Iban	48 (1)
Other Malaysian	37 (1)
Foreigner	37 (1)

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### Ethnic group distribution for patients with ACS, Malaysia 2006



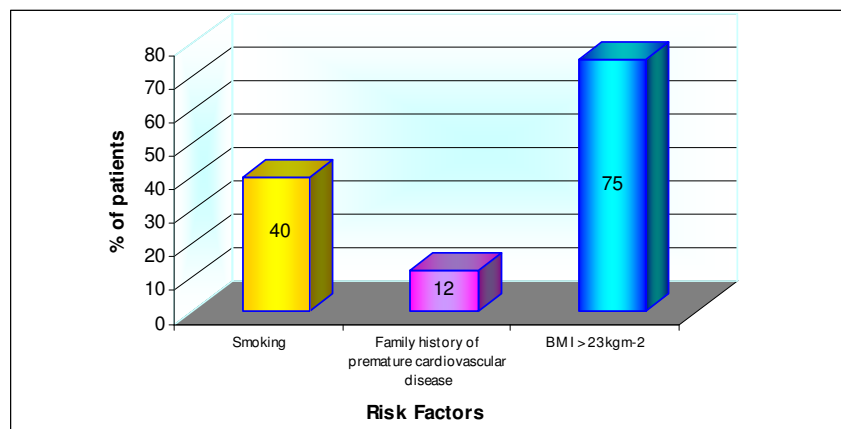
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### Other Coronary Risk Factors for patients with ACS, Malaysia 2006

Other Coronary Risk Factors (N=4332)	%
Smoking	40
Family history of premature cardiovascular disease	12
BMI > 23kgm <sup>-2</sup> Mean, SD	75 25.8 (4.4)

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## Other Coronary Risk Factors for patients with ACS, Malaysia 2006



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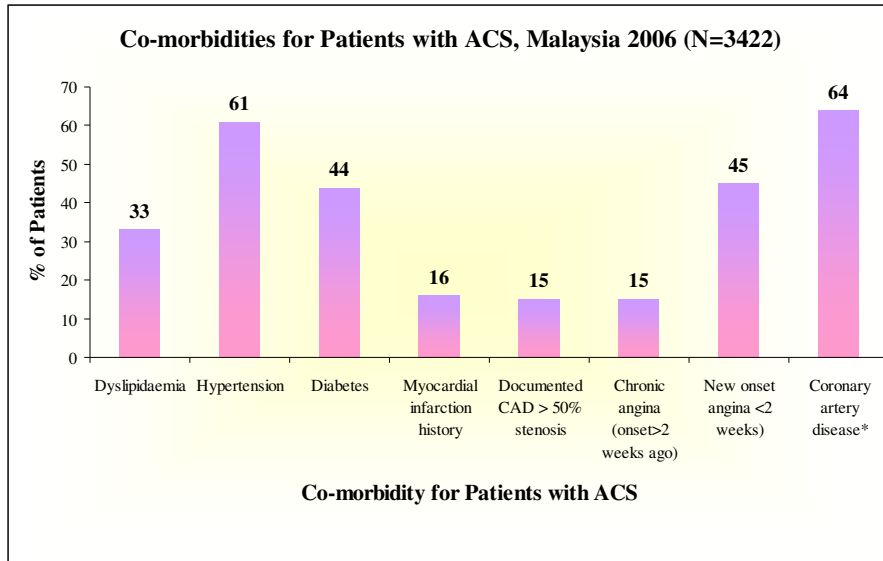
## Co-morbidities of patients with ACS, Malaysia 2006

Co-morbidities (N=3422)	%
Dyslipidaemia	33
Hypertension	61
Diabetes	44
Myocardial infarction history	16
Documented CAD > 50% stenosis	15
Chronic angina (onset > 2 weeks ago)	15
New onset angina < 2 weeks)	45
Coronary artery disease*	64

\*Coronary artery disease is defined as "Yes" on any of the following co-morbidities:  
1) History of myocardial infarction, 2) Documented CAD > 50% stenosis, 3) Chronic angina (onset more than 2 weeks ago), 4) New onset angina (less than 2 weeks).

Note: Percentage is to the nearest decimal point.

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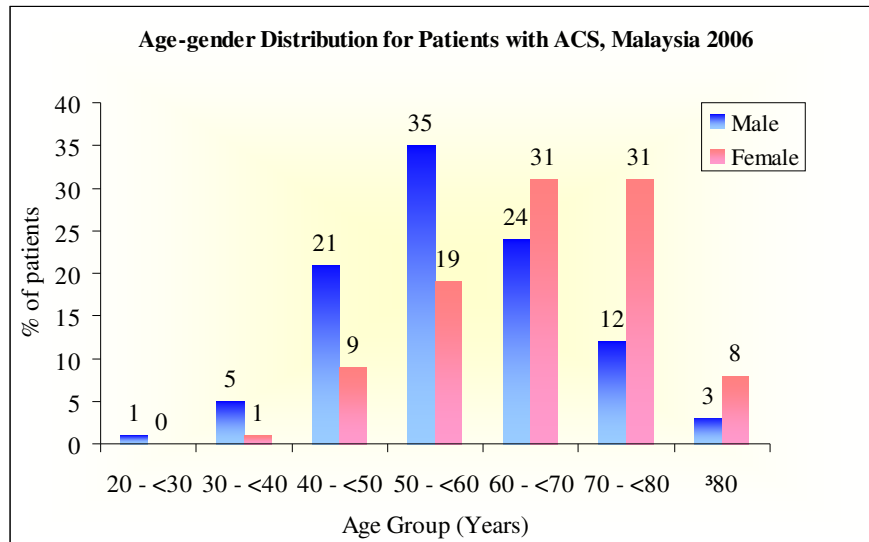


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### Age-gender distribution for patients with ACS, Malaysia 2006

Age group	Male	Female
20 - <30	1	0
30 - <40	5	1
40 - <50	21	9
50 - <60	35	19
60 - <70	24	31
70 - <80	12	31
≥80	3	8

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## Chapter 3: Clinical Presentation and Investigation

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## Cardiac Presentations of Patients with ACS by ACS Stratum, Malaysia 2006

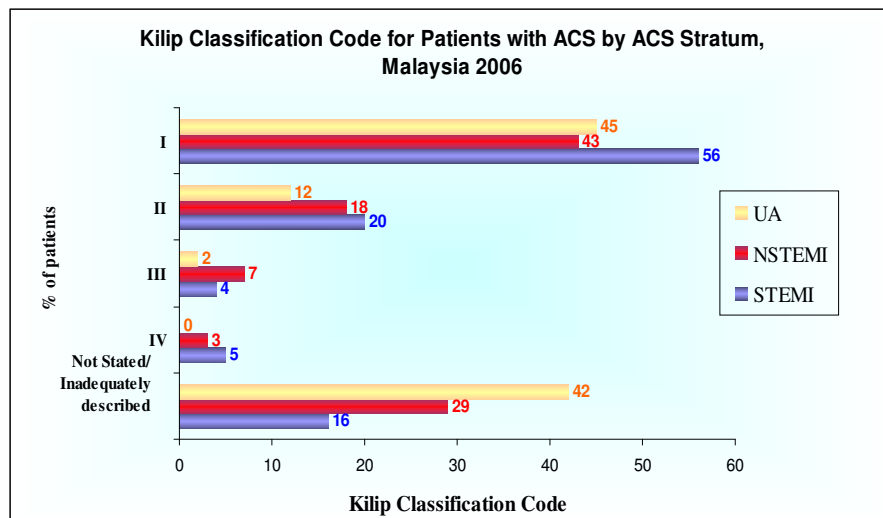
	STEMI N=1445	NSTEMI N=1132	UA N=845
<b>Systolic blood pressure, mmHg</b>			
N	1428	1116	836
Mean, SD	134 (28)	145 (30)	146 (28)
Median, (min, max)	130 (60, 230)	142 (66, 230)	142 (60, 224)

<b>Diastolic blood pressure, mmHg</b>			
N	1402	1087	823
Mean, SD	80 (17)	82 (17)	82 (15)
Median, (min, max)	80 (26, 120)	82 (19, 120)	82 (34, 120)

<b>Heart rate at presentation, beats/min</b>			
N	1434	1122	838
Mean, SD	82 (21)	86 (23)	81 (19)
Median, (min, max)	80 (30, 180)	84 (29, 180)	79 (40, 166)

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Syndrome (ACS) Registry, Malaysia 2006

## Cardiac Presentations of Patients with ACS by ACS Stratum, Malaysia 2006



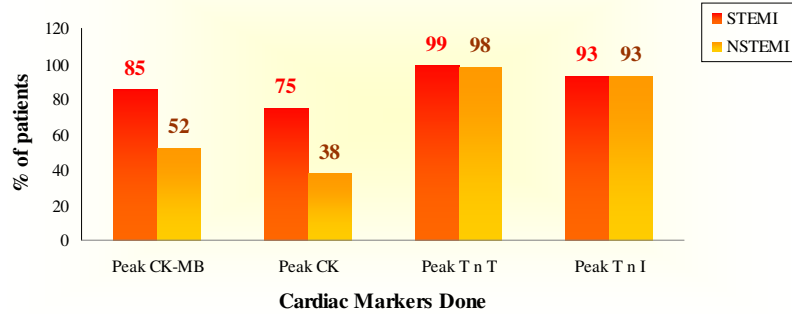
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## Cardiac Biomarkers Done for Patients with ACS by ACS Stratum, Malaysia 2006

	STEMI (N=1445)	NSTEMI (N=1132)
Patients with any cardiac marker done, no. %	1402 (97)	1114 (98)
Peak CK-MB, Unit/L, no. %	801	874
>25	681 (85)	457 (52)
Peak CK, Unit/L, no. %	1325	970
>2x reference upper limits	999 (75)	364 (38)
Peak TnT, no. %	183	446
Positive or >0.01	181 (99)	436 (98)
Peak TnI, no. %	58	167
Positive or > reference upper limit/0.04	54 (93)	156 (93)

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## Cardiac Markers Done for ACS Patients by ACS Stratum\*, Malaysia 2006



\* The denominators are based on STEMI, N=1445 and NSTEMI, N= 1132.

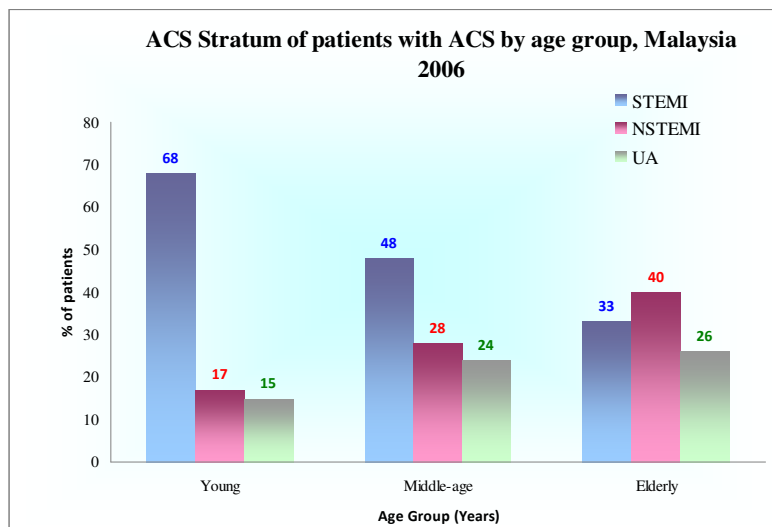
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## ACS Stratum for Patients with ACS by Age Group, Malaysia 2006

Acute coronary syndrome stratum, no. %	Age group*		
	Young	Middle-age	Elderly
	N=166	N=1675	N=1581
STEMI	113 (68)	803 (48)	529 (33)
NSTEMI	28 (17)	469 (28)	635 (40)
UA	25 (15)	403 (24)	417 (26)

*\*Young is defined as age from 20 to less than 40 years, middle-age is defined as age between 40 to less than 60 years and elderly is defined as 60 years and above  
Note: Percentage is to the nearest decimal point.*

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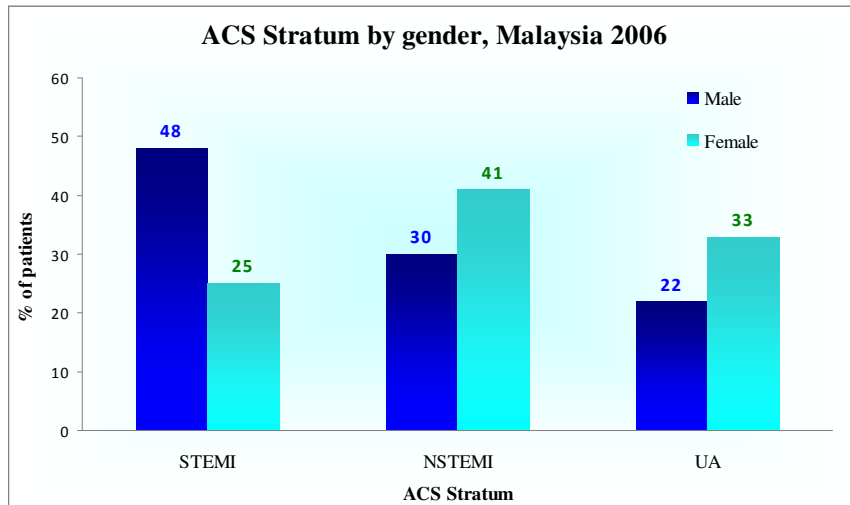
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Syndrome (ACS) Registry, Malaysia 2006

**Cardiac presentation of patients with ACS by gender,  
Malaysia 2006**

Acute Coronary Syndrome Stratum, No. (%)	Male	Female
	N=2569	N=853
STEMI	1230 (48)	215 (25)
NSTEMI	779 (30)	353 (41)
UA	560 (22)	285 (33)

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**ACS Stratum by gender, Malaysia 2006**



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# Chapter 4: Treatment

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## Summary of treatments for patients with ACS by ACS stratum, Malaysia 2006

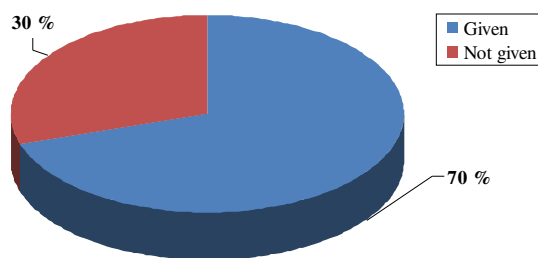
No. (%)	STEMI	NSTEMI	UA
	N=1445	N=1132	N=845
Total admission days*			
N	1420	1104	830
Mean, SD	6 (3)	6 (4)	5 (4)
Median, (min, max)	5 (1,28)	5 (1,30)	4 (1,29)

Number of days on CCU			
N	1093	450	140
Mean, SD	3 (3)	4 (3)	3 (3)
Median, (min, max)	3 (1,26)	3 (1,24)	2 (1,20)

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### Fibrinolytic Therapy for ACS Patients with STEMI, Malaysia 2006

<b>Fibrinolytic therapy for STEMI (N=1445)</b>	<b>No. (%)</b>
Given	1018 (70)
Not given	427 (30)



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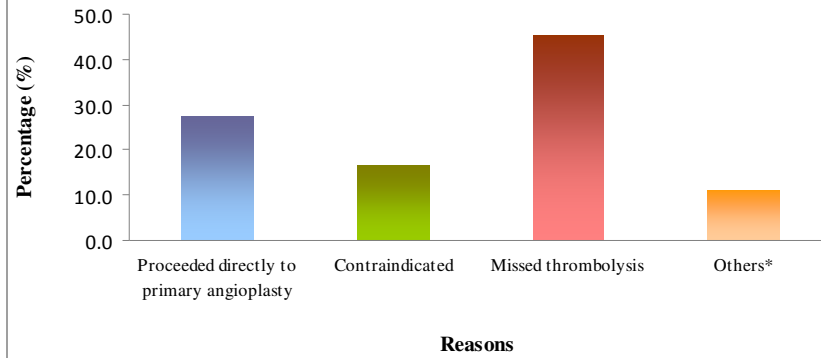
### Reasons Fibrinolytic Therapy Not Given to Patients with STEMI, Malaysia 2006

<b>Reasons Fibrinolytic Therapy Not Given to ACS Patients (N=1445)</b>	<b>No. (%)</b>
Proceeded directly to primary angioplasty	117 (8)
Contraindicated	70 (5)
Missed thrombolysis	193 (13)
Others*	47 (3)

*\*Not given—Others includes missing and refusal  
Note: Percentage is to the nearest decimal point.*

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### Reasons not given Fibrinolytic Therapy for ACS Patients with STEMI, Malaysia 2006



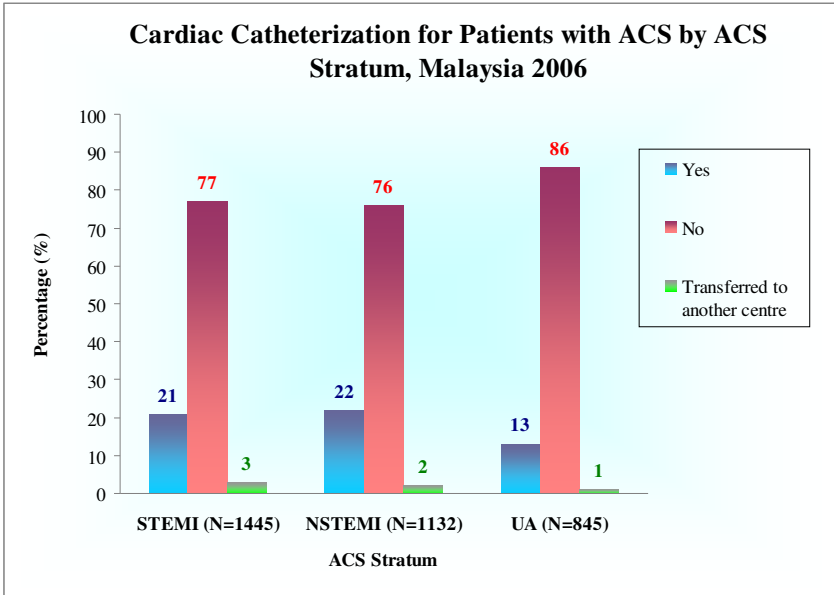
\*Not given—Others includes missing and refusal  
 Note: Percentage is to the nearest decimal point.

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### Cardiac Catheterization for Patients with ACS by ACS Stratum, Malaysia 2006

Cardiac catheterization, no. %	STEMI (N=1445)	NSTEMI (N=1132)	UA (N=845)
Yes	298 (21)	251 (22)	106 (13)
No	1106 (77)	858 (76)	727 (86)
Transferred to another centre	39 (3)	23 (2)	12 (1)

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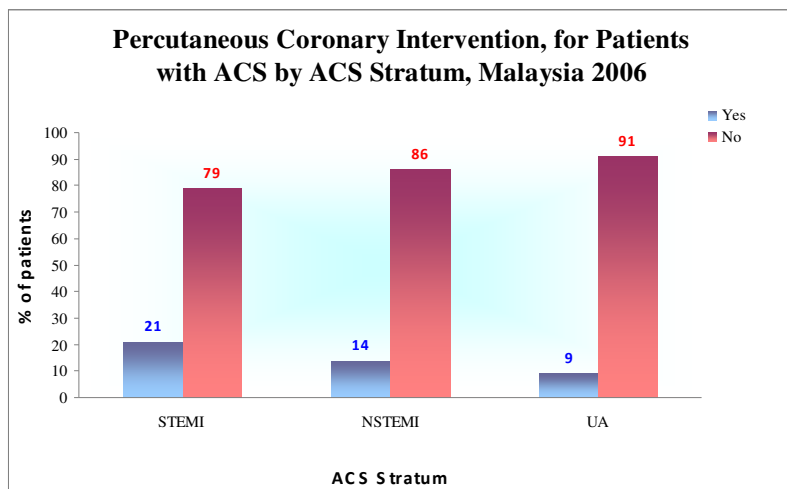


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### Percutaneous Coronary Intervention, for Patients with ACS by ACS Stratum, Malaysia 2006

Percutaneous coronary intervention, no. %	STEMI (N=1445)	NSTEMI (N=1132)	UA (N=845)
Yes	308 (21)	162 (14)	80 (9)
No	1137 (79)	970 (86)	765 (91)

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### CABG for Patients with ACS by ACS Stratum, Malaysia 2006

CABG, no. %	STEMI (N=1445)	NSTEMI (N=1132)	UA (N=845)
Yes	10 (1)	42 (4)	15 (2)
No	1435 (99)	1090 (96)	830 (98)

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# Chapter 5: Outcomes

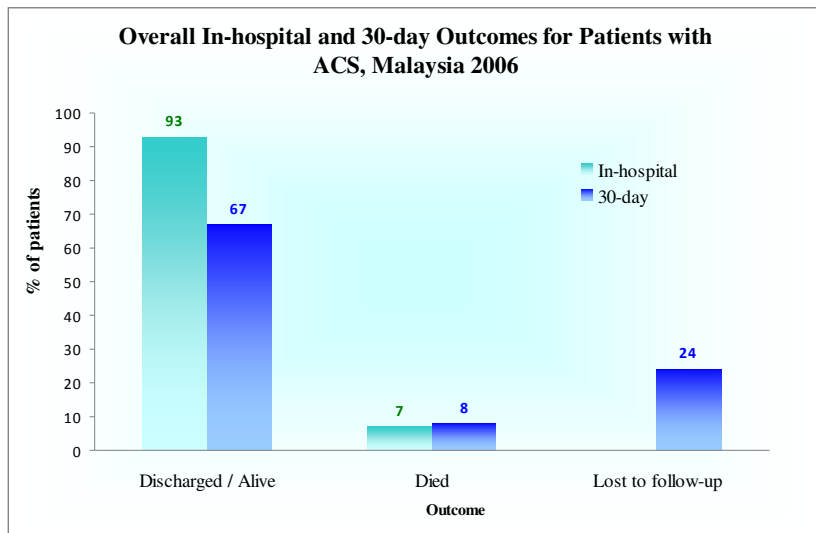
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## Overall Outcomes for Patients with ACS, Malaysia 2006

Outcome	Overall outcome			
	In-hospital		30-day*	
	No.	%	No.	%
Discharged / Alive	3186	93	2302	67
Died	229	7	288	8
Lost to follow-up	NA	NA	832	24
Missing	7	0	0	0

*\*Including patients who died in-hospital  
Note: Percentage is to the nearest decimal point.*

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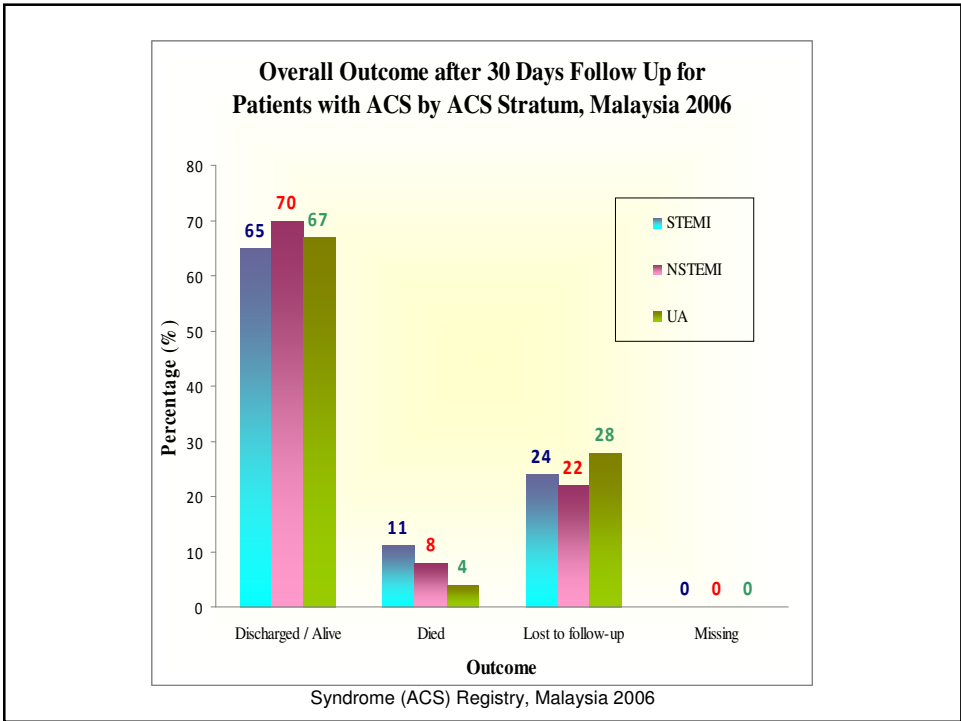
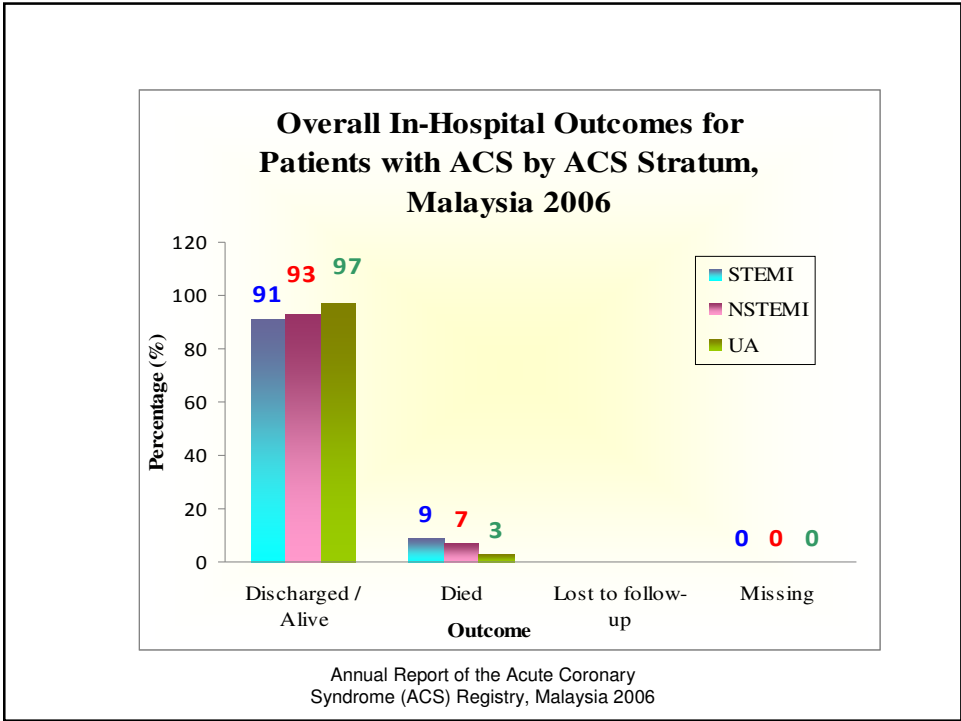
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**Overall outcomes for patients with ACS by ACS stratum, Malaysia 2006**

Outcome	In-hospital						30-day*					
	STEMI		NSTEMI		UA		STEMI		NSTEMI		UA	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Discharged /Alive	1312	91	105	93	818	97	939	65	796	70	567	67
Died	129	9	75	7	25	3	158	11	92	8	38	4
Lost to follow-up	NA	NA	NA	NA	NA	NA	348	24	244	22	240	28
Missing	4	0	1	0	2	0	0	0	0	0	0	0

•\*Including patients who died in-hospital.  
Note: Percentage is to the nearest decimal point.

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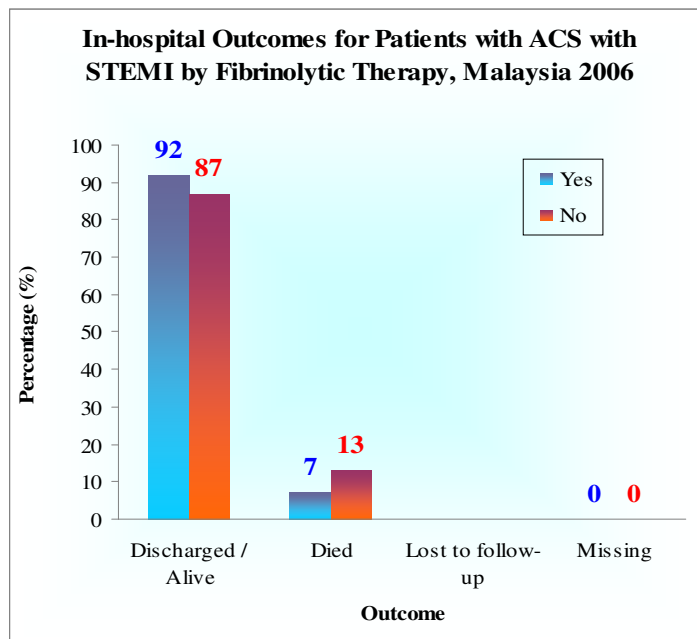
**Overall outcomes for patients with STEMI by fibrinolytic therapy, Malaysia 2006**

Outcome	In-hospital				30-day*			
	Fibrinolytic therapy				Fibrinolytic therapy			
	Yes		No		Yes		No	
	No.	%	No.	%	No.	%	No.	%
Discharged / Alive	940	92	372	87	686	67	253	59
Died	74	7	55	13	90	9	68	16
Lost to follow-up	NA	NA	NA	NA	242	24	106	25
Missing	4	0	0	0	0	0	0	0

\*Including patients who died in-hospital.  
 Note: Percentage is to the nearest decimal point.

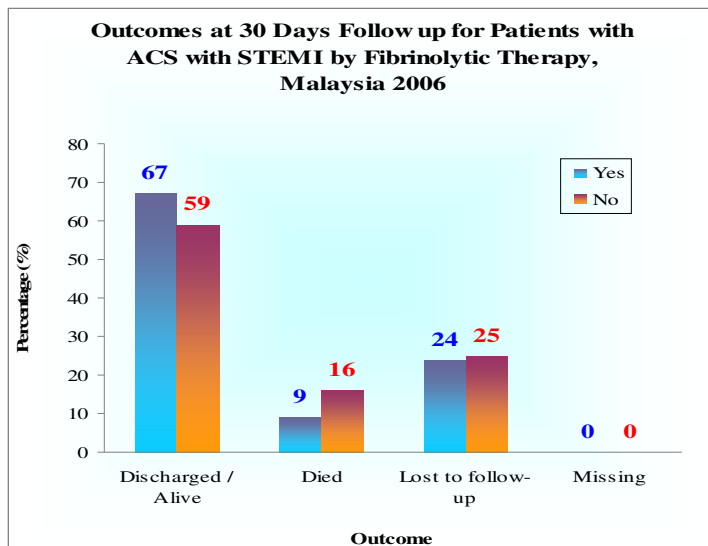
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**In-hospital Outcomes for Patients with ACS with STEMI by Fibrinolytic Therapy, Malaysia 2006**



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**Outcomes at 30 Days Follow up for Patients with ACS with STEMI by Fibrinolytic Therapy, Malaysia 2006**



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**Overall outcomes for patients with STEMI by Percutaneous Coronary Intervention, Malaysia 2006**

Outcome	In-hospital				30-day*			
	Percutaneous coronary intervention				Percutaneous coronary intervention			
	Yes		No		Yes		No	
	No.	%	No.	%	No.	%	No.	%
Discharged / Alive	283	92	1029	91	242	79	697	61
Died	25	8	104	9	34	11	124	11
Lost to follow-up	NA	NA	NA	NA	32	10	316	28
Missing	0	0	4	0	0	0	0	0

\*Including patients who died in-hospital.

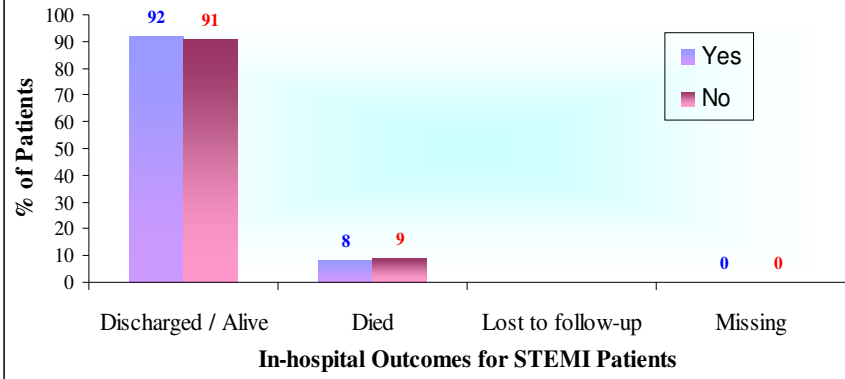
Notes:

1. Percentage is to the nearest decimal point.

2. Percutaneous Coronary Intervention includes primary, rescue and facilitated intervention

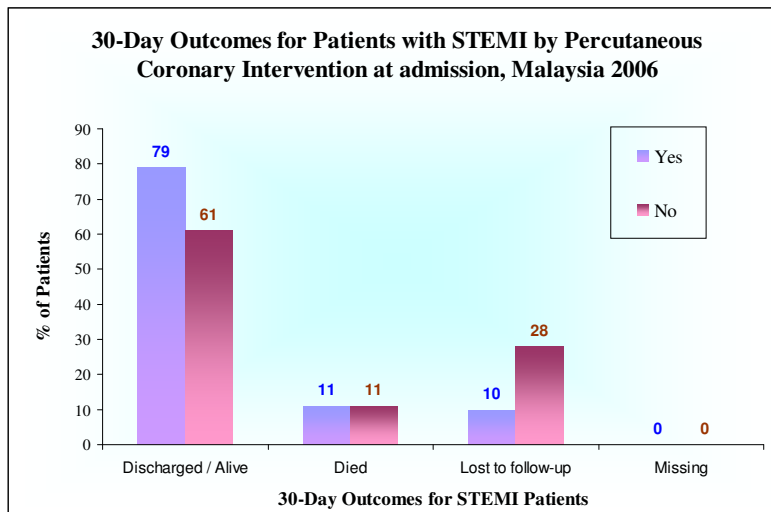
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**In-hospital Outcomes for Patients with STEMI by Percutaneous Coronary Intervention at admission, Malaysia 2006**



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**30-Day Outcomes for Patients with STEMI by Percutaneous Coronary Intervention at admission, Malaysia 2006**

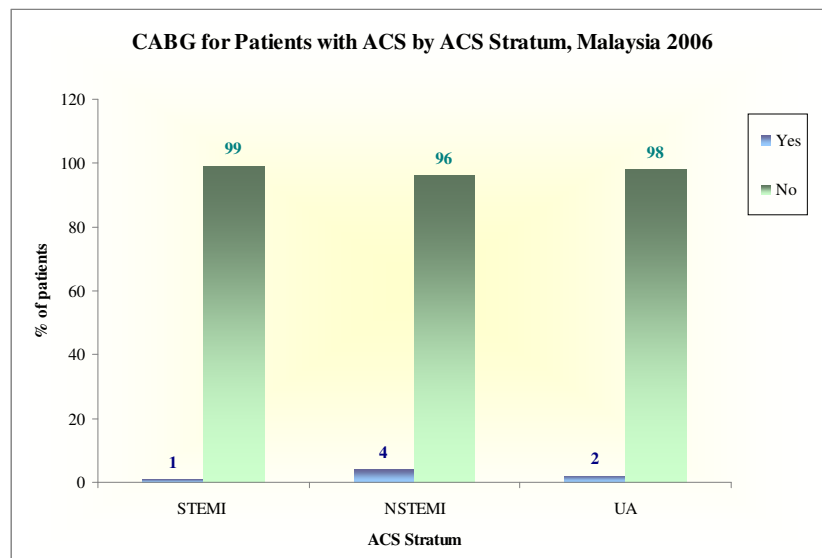


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**CABG for Patients with ACS by ACS Stratum,  
Malaysia 2006**

<b>CABG, no. %</b>	<b>STEMI (N=1445)</b>	<b>NSTEMI (N=1132)</b>	<b>UA (N=845)</b>
Yes	10 (1)	42 (4)	15 (2)
No	1435 (99)	1090 (96)	830 (98)

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### Overall outcomes for patients with STEMI by pre-admission aspirin use, Malaysia 2006

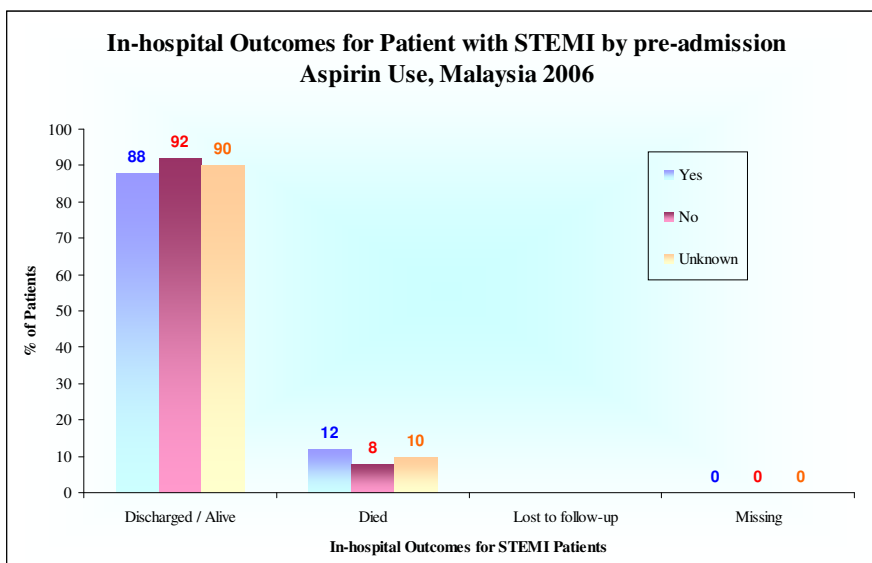
Outcome	In-hospital						30-day*					
	Pre-admission aspirin use						Pre-admission aspirin use					
	Yes		No		Unknown		Yes		No		Unknown	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Discharged / Alive	200	88	885	92	227	90	128	56	660	68	151	60
Died	27	12	76	8	26	10	33	15	95	10	30	12
Lost to follow-up	NA	NA	NA	NA	NA	NA	66	29	210	22	72	28
Missing	0	0	4	0	0	0	0	0	0	0	0	0

\*Including patients who died in-hospital.

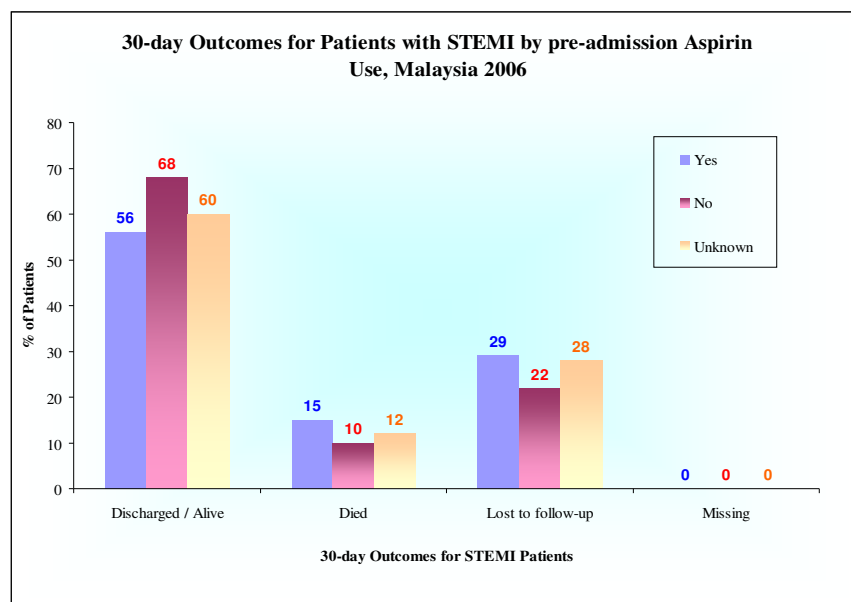
Note: Percentage is to the nearest decimal point.

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### In-hospital Outcomes for Patient with STEMI by pre-admission Aspirin Use, Malaysia 2006



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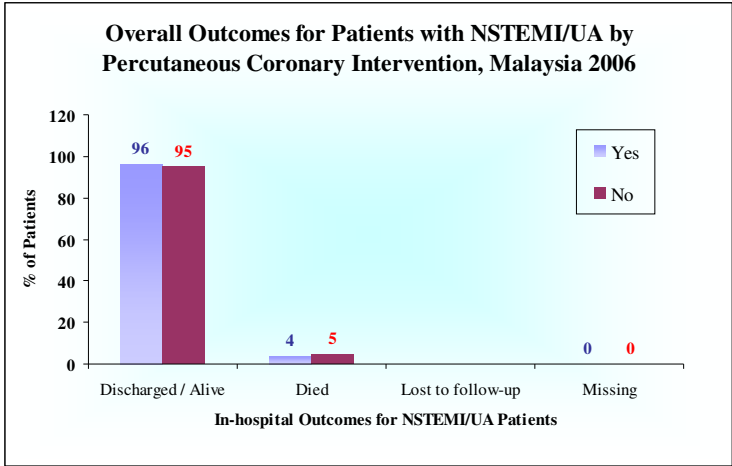
### Overall outcomes for patients with NSTEMI/UA by Percutaneous Coronary Intervention, Malaysia 2006

Outcome	In-hospital				30-day*			
	Percutaneous coronary intervention				Percutaneous coronary intervention			
	Yes		No		Yes		No	
	No.	%	No.	%	No.	%	No.	%
Discharged / Alive	233	96	1641	95	207	86	1156	67
Died	9	4	91	5	12	5	118	7
Lost to follow-up	NA	NA	NA	NA	23	10	461	27
Missing	0	0	3	0	0	0	0	0

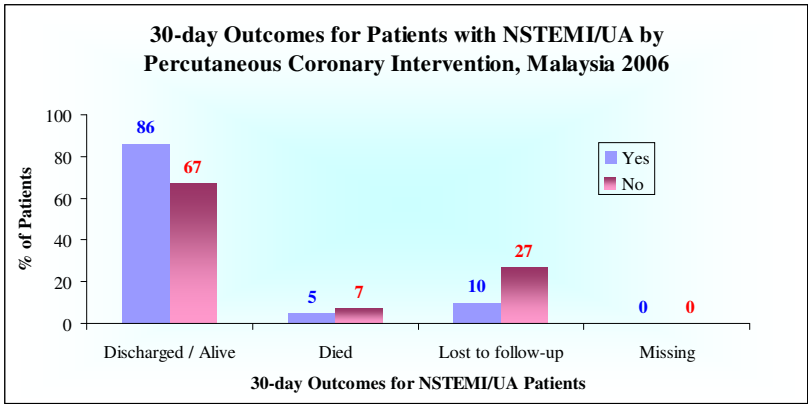
\*Including patients who died in-hospital.

Note: Percentage is to the nearest decimal point.

Annual Report of the Acute Coronary Syndrome (ACS) Registry, Malaysia 2006



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**Overall outcomes for patients with NSTEMI/UA by CABG,  
Malaysia 2006**

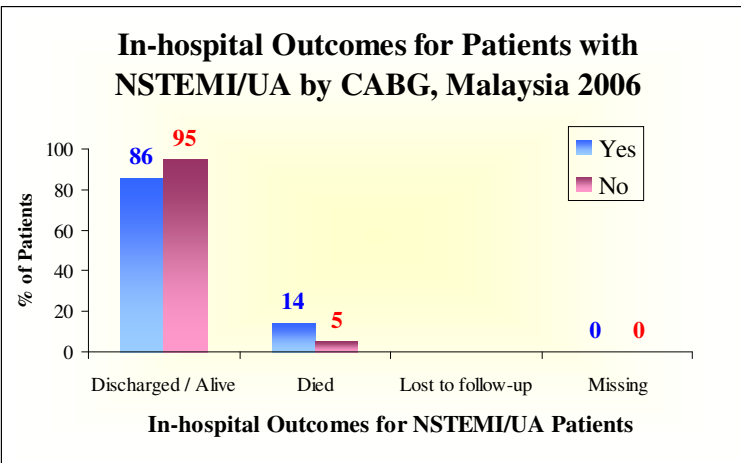
Outcome	In-hospital				30-day*			
	CABG				CABG			
	Yes		No		Yes		No	
	No.	%	No.	%	No.	%	No.	%
Discharged / Alive	49	86	1825	95	47	82	1316	69
Died	8	14	92	5	8	14	122	6
Lost to follow-up	NA	NA	NA	NA	2	4	482	25
Missing	0	0	3	0	0	0	0	0

\*Including patients who died in-hospital.

Note: Percentage is to the nearest decimal point.

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Syndrome (ACS) Registry, Malaysia 2006

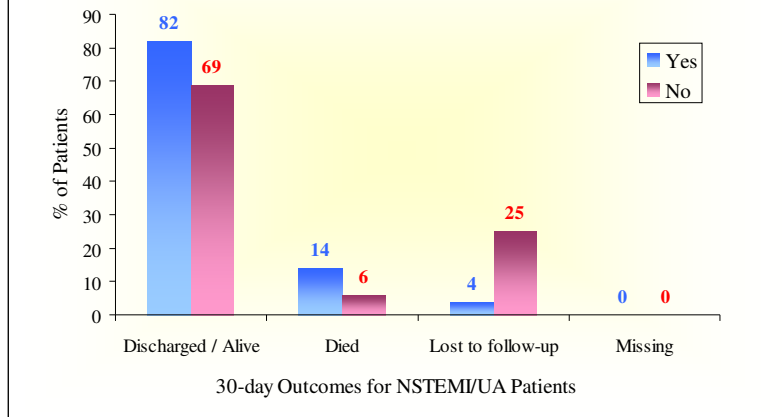
**In-hospital Outcomes for Patients with  
NSTEMI/UA by CABG, Malaysia 2006**



Annual Report of the Acute Coronary  
Syndrome (ACS) Registry, Malaysia 2006



### 30-day Outcomes for Patients with NSTEMI/UA by CABG, Malaysia 2006



Annual Report of the Acute Coronary Syndrome (ACS) Registry, Malaysia 2006

The full report is available for download at

[www.acrm.org.my/ncvd](http://www.acrm.org.my/ncvd)

Annual Report of the Acute Coronary Syndrome (ACS) Registry, Malaysia 2006