CHAPTER 2

PATIENT CHARACTERISTICS

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Introduction

In 2006, a total of 3422 patients had baseline characteristics recorded in the Acute Coronary Syndrome section of the National Cardiovascular Database (ACS; NCVD). These were divided into patient demographics, significant past medical history and anthropometric measurements (Table 2.1)

Demographics

Of the ethnic distribution, 49% of patients were Malay, 23% Chinese, 23% Indian, and approximately 4% representing other indigenous groups as well as non-Malaysian nationals. The ethnic groups were subdivided into 12 categories to include the most prevalent groups: namely Malay, Chinese, Indian, Orang Asli, Kadazan, Melanau, Murut, Bajau, Bidayuh, Iban, Malaysians of other ethnicities and non-Malaysian nationals. The mean age of the patients was 59 years (range 21-100); 23% of the patients were below 50 years; 31% of patients were aged between 50 and 60 years old; 26% were aged between 60 and 70 years old and the remaining 21% aged 70 years and older. In term of gender, 75% of the patients were male.

Significant past medical history

Smoking history was subdivided to patients having never smoked, 'former smokers' and current smokers. Our findings revealed 40% of patients had never smoked prior to admission, 24% were former smokers and 33% were current smokers. A significant number of patients had a family history of premature cardiovascular disease. Of the 61% of this data field completed, it was noted that 19.7% of patients did have a 'positive' family history. In a recent Public Health Survey, dyslipidaemia, hypertension and diabetes were noted to be prevalent amongst Malaysian adults[3]. Not surprisingly, of the 59% of the dyslipidaemia data field completed, 55.9% of patients had a diagnosis of the condition prior to presentation with ACS. Of the 84% of the hypertension data field completed, 72.6% of patients had a diagnosis of the condition prior to presentation of ACS. Of the 80% of the diabetes data field completed, 55.0% of patients had a diagnosis of the condition prior to admission.

Having a prior history of myocardial infarction increases the risk of subsequent ACS compared to those who had not. Of the 70% of this data field completed, 22.9% of patients had a prior history of a myocardial infarction prior to the index admission with ACS. Similarly, a history of documented coronary artery disease could increase this risk. Of the 66% of this data field completed, 22.7% of the patients had a positive finding of documented coronary artery disease prior to the index admission with ACS.

In terms of symptoms of angina, of the 74% of the data field completed for chronic angina prior to admission, 20.2% of patients were found to have this condition. Of the 79% of the data field

completed for new onset angina prior to admission, 57.0% of patients had this condition prior to the index admission for ACS. Heart failure, particularly of ischaemic origin, is associated with poorer long term clinical outcomes. Of the 75% of this data field completed, 10.7% of patients had a prior history of heart failure prior to admission.

Other non-cardiac co-morbid conditions were also investigated. The result shows that 4% of patients had a history of chronic lung disease prior to admission, with 75% of this data field completed. 7% of patients had renal disease prior to admission, with 75% of this data field completed. 4% of patients had a prior history of cerebrovascular disease, with 75% of this data field completed. 1% of patients had a prior history of peripheral vascular disease, with 74% of this data field completed, Combining all the variables above, 91% of the data fields were completed; 97.8% of patients had at least one of the above-mentioned cardiovascular risk factors at the index admission with ACS.

Analysis of patients with coronary artery disease, aggregating subjects with a prior history of myocardial infarction, with angiographically-proven coronary stenosis of greater than 50%, with chronic angina and new onset angina, 80% of the data fields were completed; 80.0% of patients had symptoms or established documented evidence of coronary artery disease prior to the index admission with ACS.

Anthropometrics

Patient anthropometric data was subdivided into Body Mass Index (BMI), Waist-Hip Ratio (WHR) and waist circumference.

The mean BMI was 25.8 ± 4.51; the median BMI was 25.2 (13.2-62.4). 75% of subjects had a BMI>23. 40.7% of patients had a calculated WHR obtained. The mean WHR was 0.97 ± 0.08; the median WHR was 0.96 (0.54-1.85). 28% of male subjects had a WHR>1.0; 88% of female subjects had a WHR>0.85. 34.0% had a waist circumference measurement performed. The mean value was 89.8 ± 14.6 cm; the median value was 90cm (36-160); 50% of male subjects had a value over 90cm; 80% of female patients had a value over 80cm.

Patient characteristics and different types of ACS presentations (Table 2.6)

Subdividing ACS presentations to ST-elevation myocardial infarction (STEMI; n=1445), non-STEMI (n=1132) and unstable angina (UA; n=845), we found that 42% of patients were admitted with STEMI, 33% with non-STEMI, and 25% unstable angina.

Mean ages for patients presenting with STEMI, NSTEMI and UA were 56, 62 and 60 years respectively; the patient group aged between 50 and 60 years old accounting for 32%, 29% and 31%

of each type of ACS presentation respectively. Comparing gender of ACS presentation in STEMI, NSTEMI and UA group males comprised 85%, 69% and 66% in each group, respectively. On ethnicity, Malays accounted for 54% of patients admitted with STEMI, 45% for NSTEMI and 46% with UA.

Fifty percent of patients admitted with STEMI were current smokers, compared to 23% in the NSTEMI group, and 18% in the UA group. “Never been smokers” accounted for 29% of the STEMI group, 49% for the NSTEMI group and 48% of the UA group. Twelve percent of patients admitted with STEMI had a family history of premature cardiovascular disease, compared with 11% in the NSTEMI group and 13% in the UA group. Nineteen percent in the STEMI group, 41% in the NSTEMI group and 46% in the UA group recorded history of dyslipidaemia. Forty-seven percent in the STEMI group, 70% in the NSTEMI group and 73% in the UA group had a history of hypertension. Thirty-six percent in the STEMI group, 51% in the NSTEMI group and 47% in the UA group had a history of diabetes.

Ten percent in the STEMI group, 19% in the NSTEMI group and 24% in the UA group had a prior history of myocardial infarction. Five percent of patients in the STEMI group, 20% of patients in the NSTEMI group and 24% of patients in the UA group had a previously documented significant coronary artery disease. Accordingly, 7% in the STEMI group, 17% in the NSTEMI group and 25% in the UA group had a prior history of chronic stable angina; however, 43% in the STEMI group, 48% in the NSTEMI group and 43% in the UA group had new onset angina. Three percent in the STEMI group, 14% in the NSTEMI group and 10% in the UA group had a recorded history of heart failure prior to the index admission with ACS.

Two percent in the STEMI group, 5% in the NSTEMI group and 5% in the UA group had a prior history of chronic lung disease. Four percent in the STEMI group, 13% in the NSTEMI group and 6% in the UA group had a prior history of renal disease. Three percent in the STEMI group, 6% in the NSTEMI group and 4% in the UA group had a prior history of cerebrovascular disease; <1% in the STEMI group; 2% in the NSTEMI group and 1% in the UA group had a prior history of peripheral vascular disease.

Ninety-one percent of patients in the STEMI group had at least one of the above mentioned cardiovascular risk factors at the index admission for ACS, compared to 97% in the NSTEMI group and 98% in the UA group.

Mean BMI for patients admitted with STEMI, NSTEMI and UA were 26, 25, and 26 respectively; patients with a BMI>23 accounted for 76%, 72% and 79% of the respective groups. The mean waist-hip ratio (WHR) of patients admitted with STEMI, NSTEMI and UA were 0.97, 0.97 and 0.96 respectively. Whilst the measurements in the male patients were similar, in women, 10% of patients in

the STEMI group, 14% in the NSTEMI group and 9% in the UA group had a WHR of ≤0.85. Mean waist circumference (WC) for patients admitted with STEMI was 89cm; in NSTEMI 90cm and UA 92cm. Forty-eight percent of male patients admitted with STEMI had a WC ≥90cm; compared to 47% in the NSTEMI group and 57% in the UA group. 80% of female patients admitted with STEMI had a WC ≥80, compared to 79% in the NSTEMI group, and 82% in the UA group.

Commentary

Demographics

In 2006, Malays made up an estimated 50.4% of the total population of 26.64 million, Chinese 23.7%, Indian 7.1%, and Non-Malay Bumiputera 11% [3]. The distribution of Malay and Chinese patients admitted with ACS recorded in this registry for the same year was similar with the proportion of ethnic distribution in the country. While, there were disproportionately more Indian patients and disproportionately less non-Malay Bumiputera patients.

With the country's gender distribution of nearly 1:1, it was surprising to note that 75% of the subjects were male [3]; in comparison to the 66% of male found in the Global Registry of Acute Coronary Events (GRACE) [2]. We used the GRACE Registry as the comparative in this Patient Characteristics as it is the largest ongoing, multicentre Registry, for ACS worldwide.

National statistics reported the life expectancy at birth in Malaysia in 2006 to be 74.1 years, with males living to 71.8 years and females 76.3 years [3]. The mean age for subjects in our registry was relatively young at 59 years. Eighty percent of subjects were aged less than 70 years, and significantly, 23% were aged less than 50 years. The median age of our subjects was 59, which was significantly younger than the 66 years of those found in the GRACE Registry.

Significant past medical history

In term of smoking habits amongst subjects in the Registry, 33% were current smokers, compared to 56.7% from the GRACE Registry. The National prevalence of current smokers in adults aged 25-64 years old in 2005/2006 was 25.5% [1]. Despite the comparatively smaller proportion of current smokers in our Registry as compared with GRACE, our subjects present at a younger age. It is possible that our patients are more susceptible to chemicals in cigarette smoke. This is compounded by the observation that nearly a fifth of our subjects have a documented family history of cardiovascular disease.

Hypercholesterolaemia, hypertension and diabetes are prevalent in our country, with reported figures of 53.5%, 25.7% and 5.0% amongst adults aged 25-64 years in 2005/2006 [1]. Our findings

demonstrated that for subjects enrolled into our registry in 2006, 55.9% had dyslipidaemia, 72.6% had hypertension, and 55.0% had diabetes. GRACE Registry figures are 43.6%, 57.8% and 23.3%. Our observations suggest that hypertension and diabetes confers a disproportionately higher risk for developing ACS, when compared to our National population as a whole, and compared to the subjects recruited from the GRACE Registry.

For those with symptoms and known significant coronary artery disease, 80% of our subjects have at least one of the following: a history of angina prior to the index admission with ACS, known angiographically proven coronary artery disease with at least one vessel over 50% stenosis, or a previous documented myocardial infarction. In fact, only 20.2% of patients had chronic stable angina over two weeks prior to admission in contrast with 68.1% demonstrated by the GRACE Registry.

Other cardiovascular risk factors, with the exception of renal dysfunction (9.3% versus 7.2%) featured less commonly in our subjects compared to those in the GRACE registry: history of heart failure (10.7% versus 11.0%), cerebrovascular disease (5.3% versus 8.3%) and peripheral vascular disease (1.4% versus 10.3%).

In terms of patient characteristics, improved completion of data fields over the coming years may yet shed more light into these patterns.

Anthropometrics

Anthropometric findings suggest that the majority of our subjects were overweight and had an abnormally elevated abdominal circumference.

Patient characteristics and different types of ACS presentations

Our findings reveal that the majority of ACS admissions to our hospitals were STEMI. Furthermore, there are early indications that a large majority of them were male and of Malay ethnicity. The proportion of current smokers was higher in the STEMI group, when compared to NSTEMI and UA. This could indicate that smoking plays a larger role in massive plaque rupture, a hallmark of STEMI, amongst patients admitted with ACS in Malaysia. However, other established cardiovascular risk factors appeared more prevalent in patients presenting with NSTEMI and UA when compared to STEMI. Anthropological measurements did not seem to account for significant differences among the patients presenting with the different ACS presentations except for WHR in the female gender, where a lower ratio seemed to confer a larger protective effect in NSTEMI compared to STEMI and UA.

Summary Points:

- Of the 3,422 patients admitted with ACS to the 11 participating sites in 2006, 49% were Malay, 23% Chinese, 23% Indian and about 4% were others.
- 75% of the subjects were male and the female patients may be underrepresented. The mean age for subjects in our registry was also relatively young.
- Subdividing ACS presentations revealed that 42% had STEMI, 33% NSTEMI and 25% UA.
- Patients with STEMI had a younger mean age and comprised more males, Malays and active smokers compared with NSTEMI and UA groups.
- In this registry there was higher prevalence of established cardiovascular risk factors. Upon admission with ACS, majority of them has either history of MI or are known to have significant CAD.

References:

1. "Data and Statistics"; Non-Communicable Diseases Surveillance, Malaysia. www.dph.gov.my
2. Granger CB, Goldberg RJ, Dabbous O, et al. Predictors of Hospital Mortality in the Global Registry of Acute Coronary Events. *Arch Intern Med.* 2003:163:2345-2353.
3. "Key Statistics" and "Key Data"; Department of Statistics, Malaysia. www.statistics.gov.my

Table 2.1 Summary of patients characteristics for patient with ACS, Malaysia 2006

	Total=3422
1. DEMOGRAPHICS	
1.1 Age, years	
• Mean, SD	59 (12)
• Median (min, max)	59 (21,100)
1.2 Age group, no. %	
• 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)
1.3 Gender, no. %	
• Male	2569 (75)
• Female	853 (25)
1.4 Ethnic group, no. %	
• 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)
2. OTHER CORONARY RISK FACTORS	
2.1 Smoking, no. %	
• Never	1370 (40)
• Former (quit >30 days)	805 (24)
• Current (any tobacco use within last 30 days)	1138 (33)
• Unknown	109 (3)
2.2 Family history of premature cardiovascular disease, no. %	
• Yes	404 (12)
• No	1684 (49)
• Not known	1334 (39)

	Total=3422
2.3 Antropometric	
BMI	
• N	1926
• Mean, SD	25.8 (4.4)
• Median, (min, max)	25.2 (13.2,60.4)
BMI, kg/m^2, no. %	
• <18.5	58 (3)
• 18.5-23	426 (22)
• > 23	1442 (75)
WHR	
• N	1394
• Mean, SD	0.97 (0.09)
• Median, (min, max)	0.96 (0.46,1.85)
WHR, no. %	
• Men	1091
• ≤ 1.0	786 (72)
• >1.0	305 (28)
• Women	303
• ≤ 0.85	35 (12)
• >0.85	268 (88)
Waist circumference, cm	
• N	1502
• Mean, SD	89.7 (14.4)
• Median, (min, max)	90 (36,160)
Waist circumference, cm, no. %	
• Men	1162
• ≤ 90	586 (50)
• > 90	576 (50)
• Women	340
• ≤ 80	68 (20)
• > 80	272 (80)
2.4 Co-morbidity	
Dyslipidaemia, no. %	
• Yes	1131 (33)
• No	902 (26)
• Not known	1389 (41)
Hypertension, no. %	
• Yes	2084 (61)
• No	786 (23)
• Not known	552 (16)

	Total=3422
Diabetes, no. %	
• Yes	1497 (44)
• No	1226 (36)
• Not known	699 (20)
Fasting blood glucose, mmol/L	
• N	2561
• Mean (SD)	8.2 (4)
• Median (min, max)	6.8 (3,29.9)
Myocardial infarction history, no. %	
• Yes	562 (16)
• No	1847 (54)
• Not known	1013 (30)
Documented CAD > 50% stenosis, no. %	
• Yes	508 (15)
• No	1734 (51)
• Not known	1180 (34)
Chronic angina (onset more than 2 weeks ago), no. %	
• Yes	502 (15)
• No	2012 (59)
• Not known	908 (27)
New onset angina (less than 2 weeks), no. %	
• Yes	1532 (45)
• No	1160 (34)
• Not known	730 (21)
Heart failure, no. %	
• Yes	284 (8)
• No	2289 (67)
• Not known	849 (25)
Chronic lung disease, no. %	
• Yes	130 (4)
• No	2431 (71)
• Not known	861 (25)
Renal disease, no. %	
• Yes	253 (7)
• No	2305 (68)
• Not known	864 (25)
Cerebrovascular disease, no. %	
• Yes	149 (4)
• No	2420 (71)
• Not known	853 (25)

	Total=3422
Peripheral vascular disease, no. %	
• Yes	37 (1)
• No	2492 (73)
• Not known	893 (26)
None of the above, no. %	
• Yes	67 (2)
• No	3050 (89)
• Not known	305 (9)
Coronary artery disease**, no. %	
• Yes	2199 (64)
• No	532 (16)
• Not known	691 (20)

** Not known includes patients who do not know their co-morbidities and missing data*
***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.

Figure 2.1.1 Age group (years) distribution for patients with ACS, Malaysia 2006

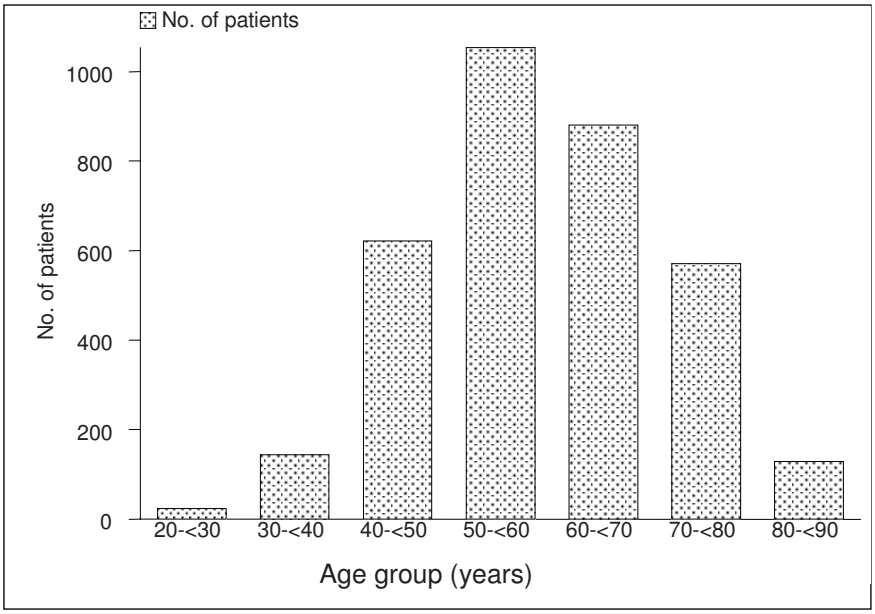


Figure 2.1.2 Gender distribution for patients with ACS, Malaysia 2006

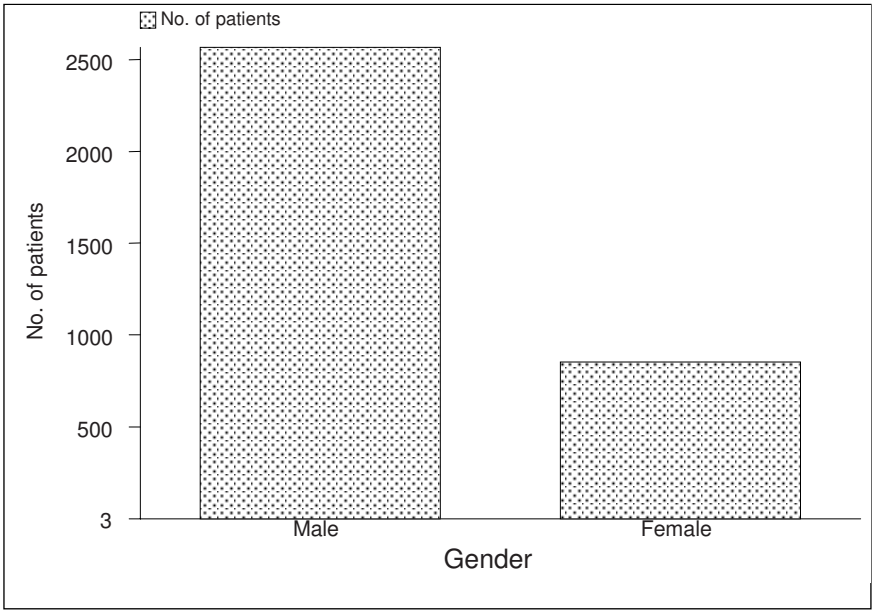


Figure 2.1.3 Ethnic group distribution for patients with ACS, Malaysia 2006

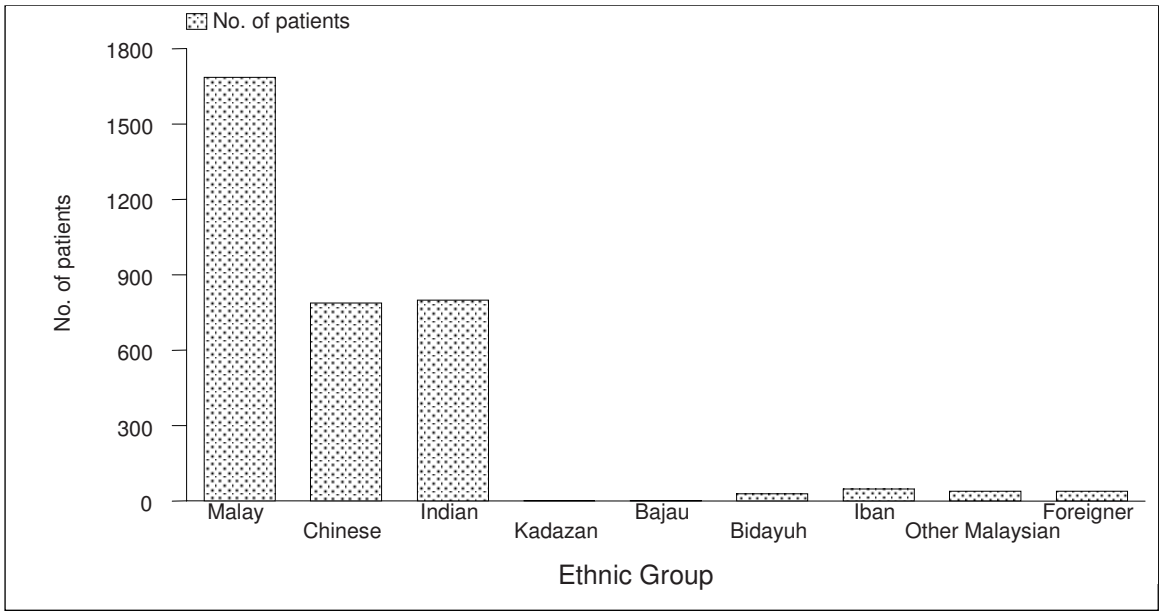
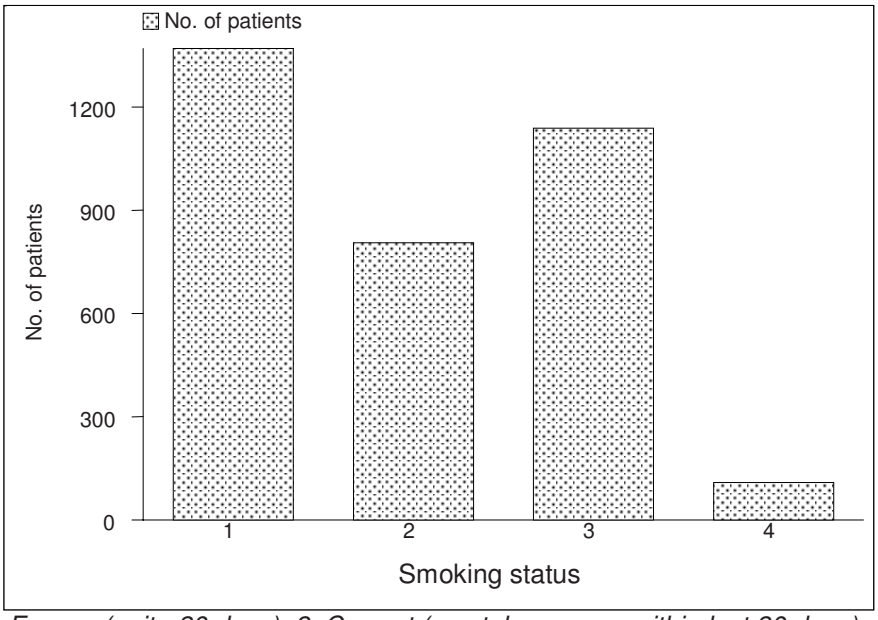


Figure 2.1.4 Smoking status for patients with ACS, Malaysia 2006



1. Never, 2. Former (quit >30 days), 3. Current (any tobacco use within last 30 days), 4. Unknown

Figure 2.1.5 Family history of premature cardiovascular disease for patients with ACS, Malaysia 2006

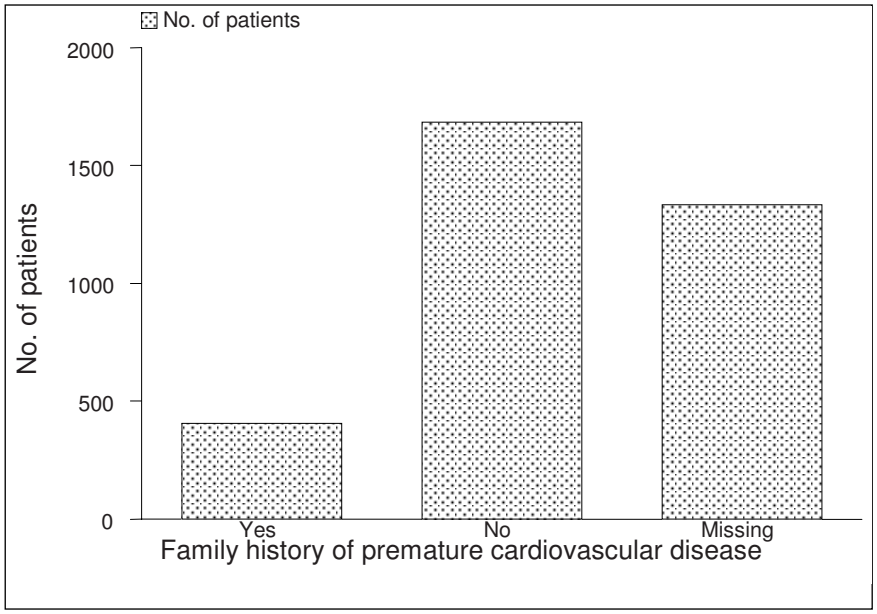


Figure 2.1.6 BMI for patients with ACS, Malaysia 2006

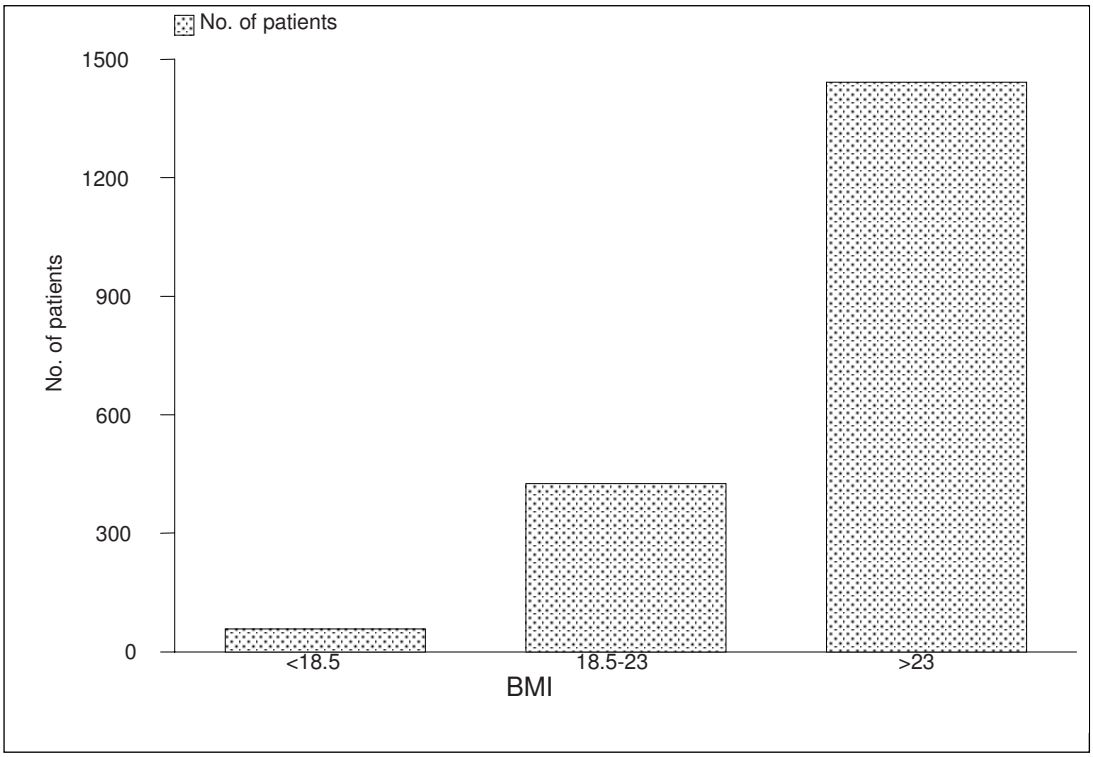


Figure 2.1.7 WHR for patients with ACS, Malaysia 2006

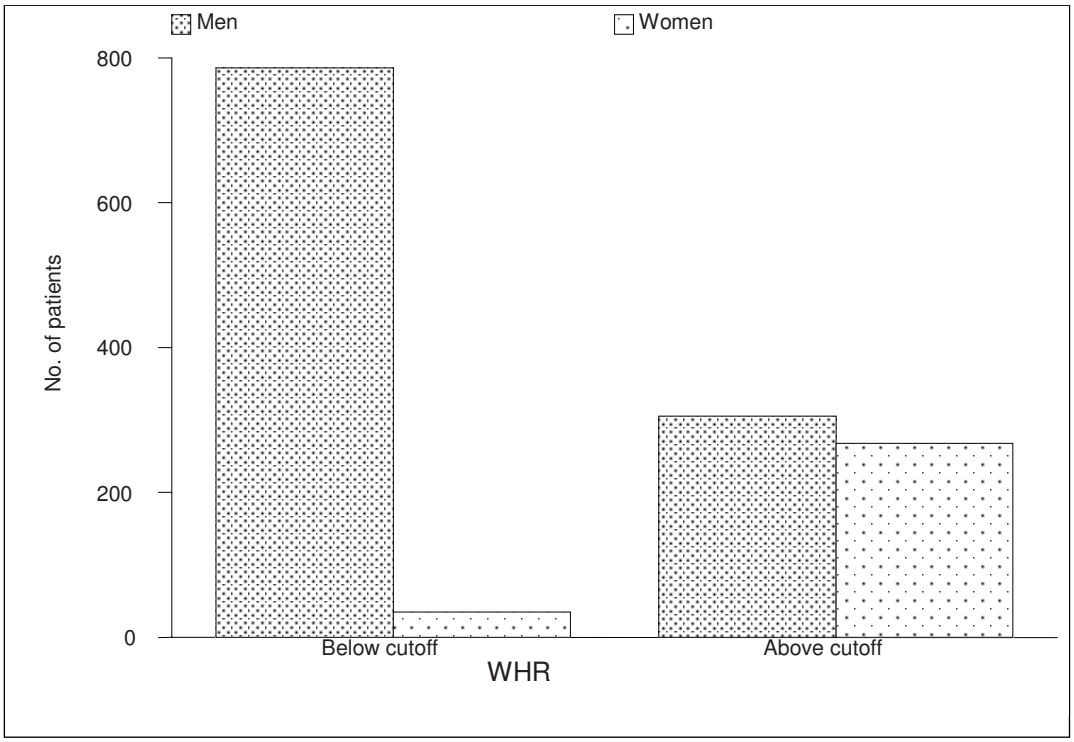


Figure 2.1.8 Waist circumference (cm) for patients with ACS, Malaysia 2006

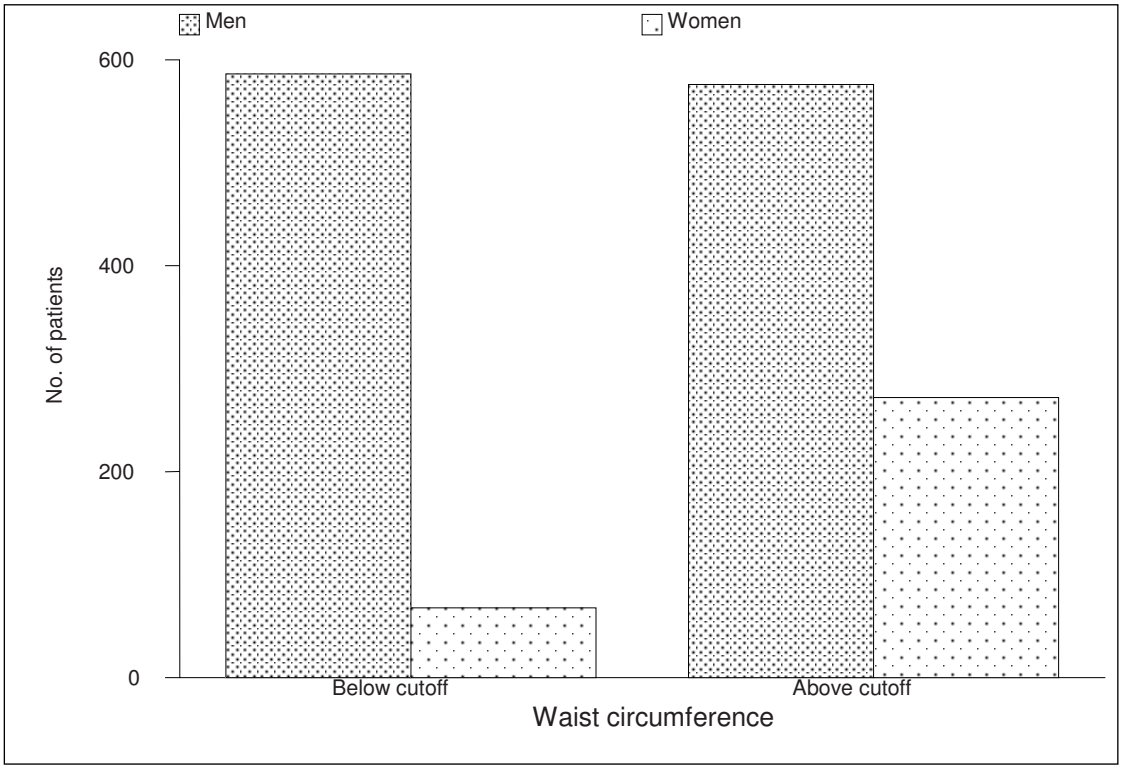
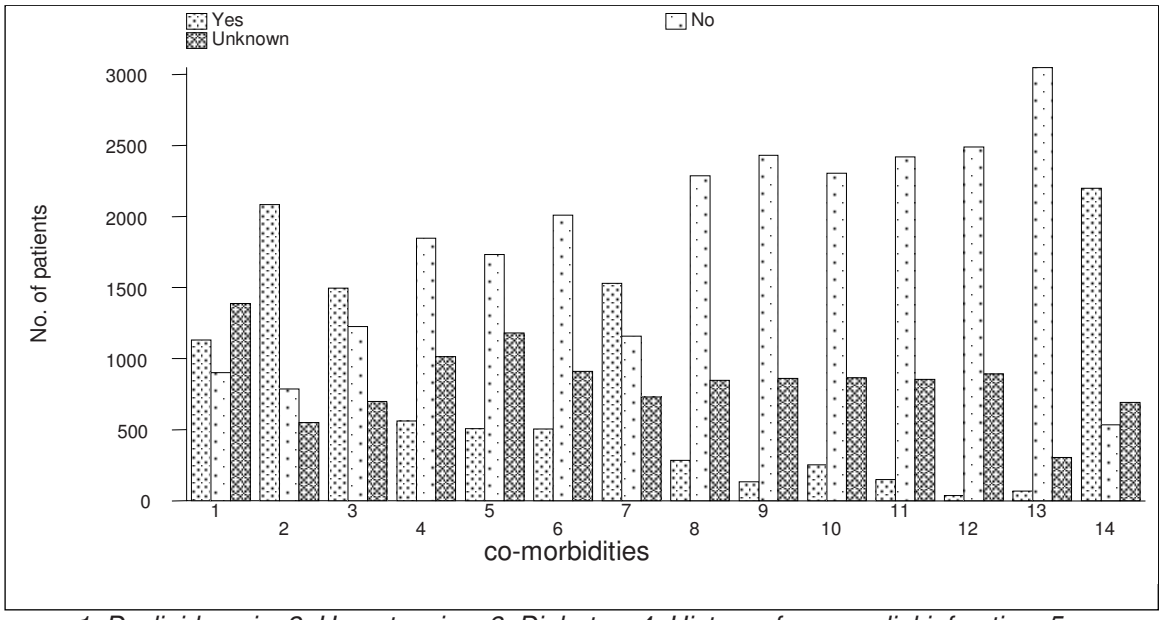


Figure 2.1.9 Co-morbidities for patients with ACS, Malaysia 2006



*1. Dyslipidaemia, 2. Hypertension, 3. Diabetes, 4. History of myocardial infarction, 5. Documented CAD > 50% stenosis, 6. Chronic angina (onset more than 2 weeks ago), 7. New onset angina (less than 2 weeks), 8. Heart failure, 9. Chronic lung disease, 10. Renal disease, 11. Cerebrovascular disease, 12. Peripheral vascular disease, 13. None of the above, 14. Coronary artery disease**

Table 2.2.1 Distribution of patients with ACS by SDP, Malaysia 2006

	SDP	No.	%
1	University Malaya Medical Centre, Kuala Lumpur	802	23
2	National Heart Institute, Kuala Lumpur	456	13
3	Kuala Lumpur Hospital, Kuala Lumpur	413	12
4	Penang Hospital, Penang	482	14
5	Sarawak General Hospital, Sarawak	375	11
6	Sultanah Aminah Hospital, Johor	242	7
7	Sultanah Bahiyah Hospital, Kedah	160	5
8	Tuanku Ja'afar Hospital, Negeri Sembilan	146	4
9	Tuanku Fauziah Hospital, Perlis	53	2
10	Raja Perempuan Zainab II Hospital, Kelantan	141	4
11	Tengku Ampuan Afzan Hospital, Pahang	152	4
	Total	**3422**	**100**

** Each SDP started to contribute data at different time*
Note: Percentage is to the nearest decimal point.

Figure 2.2.1 Distribution of patients with ACS by SDP, Malaysia 2006

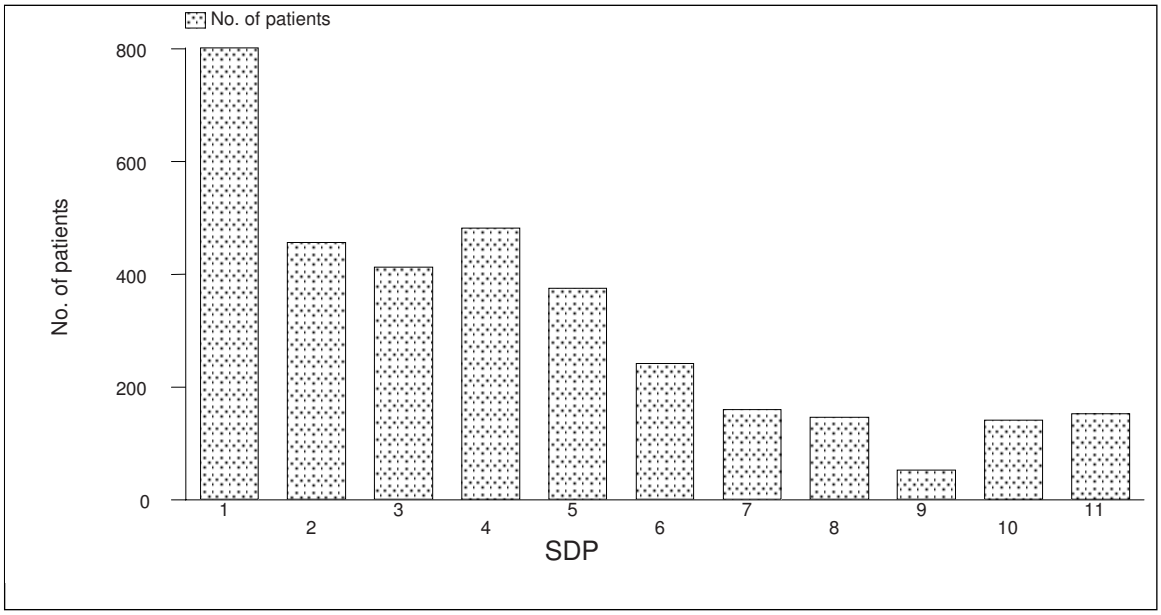


Table 2.2.2 SDP-ethnicity distribution of patients with ACS, Malaysia 2006 (row percent)

	SDP	Ethnic group									
		Malay		Chinese		Indian		Others*		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
1	University Malaya Medical Centre	264	33	180	22	335	42	23	3	802	100
2	National Heart Institute	216	47	85	19	141	31	14	3	456	100
3	Kuala Lumpur Hospital	223	54	74	18	91	22	25	6	413	100
4	Penang Hospital	190	39	172	36	113	23	7	1	482	100
5	Sarawak General Hospital	141	38	151	40	4	1	79	21	375	100
6	Sultanah Aminah Hospital	128	53	66	27	46	19	2	1	242	100
7	Sultanah Bahiyah Hospital	145	91	7	4	7	4	1	1	160	100
8	Tuanku Ja'afar Hospital	71	49	23	16	52	36	0	0	146	100
9	Tuanku Fauziah Hospital	49	92	1	2	2	4	1	2	53	100
10	Raja Perempuan Zainab II Hospital	134	95	7	5	0	0	0	0	141	100
11	Tengku Ampuan Afzan Hospital	123	81	20	13	8	5	1	1	152	100

**Others includes Orang asli, Kadazan, Melanau, Murut, Bajau, Bidayuh, Iban, other Malaysian and foreigner*

Note: Percentage is to the nearest decimal point.

Figure 2.2.2 SDP-ethnicity distribution of patients with ACS, Malaysia 2006

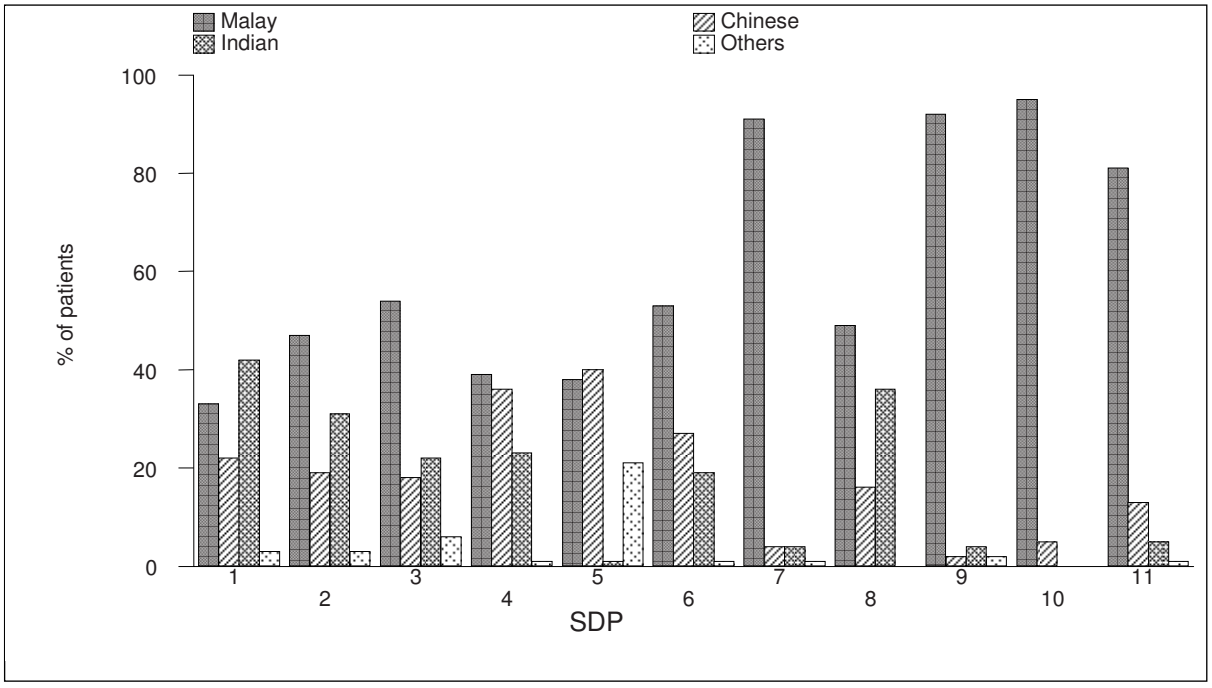


Table 2.2.3: SDP-ethnicity distribution of patients' admitted to participating sites, Malaysia 2006 (row percent)

	SDP	Ethnic group									
		Malay		Chinese		Indian		Others*		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
1	University Malaya Medical Centre	16657	41	11576	29	9826	24	2336	6	40395	100
2	National Heart Institute	5357	51	2096	20	2447	23	534	5	10434	100
3	Kuala Lumpur Hospital	7739	67	691	6	1565	13	1605	14	11600	100
4	Penang Hospital	18162	42	16615	39	6218	14	1916	4	42911	100
5	Sarawak General Hospital	12218	37	8156	25	92	0	12641	38	33109	100
6	Sultanah Aminah Hospital	37248	58	14125	22	7735	12	5485	8	64593	100
7	Sultanah Bahiyah Hospital	14381	82	1857	11	628	4	626	4	17492	100
8	Tuanku Ja'afar Hospital	23083	53	7571	17	10690	24	2306	5	43650	100
9	Tuanku Fauziah Hospital	23221	89	1505	6	353	1	919	4	25998	100
10	Raja Perempuan Zainab II Hospital	37716	94	1220	3	91	0	1095	3	40122	100
11	Tengku Ampuan Afzan Hospital	25112	78	3986	12	1363	4	1680	5	32141	100

+ Patients age > 20 years old only
**Others includes Orang asli, Kadazan, Melanau, Murut, Bajau, Bidayuh, Iban, other Malaysian and foreigner*
Note: Percentage is to the nearest decimal point.

Figure 2.2.3: SDP-ethnicity distribution of patients' admitted to participating sites, Malaysia 2006

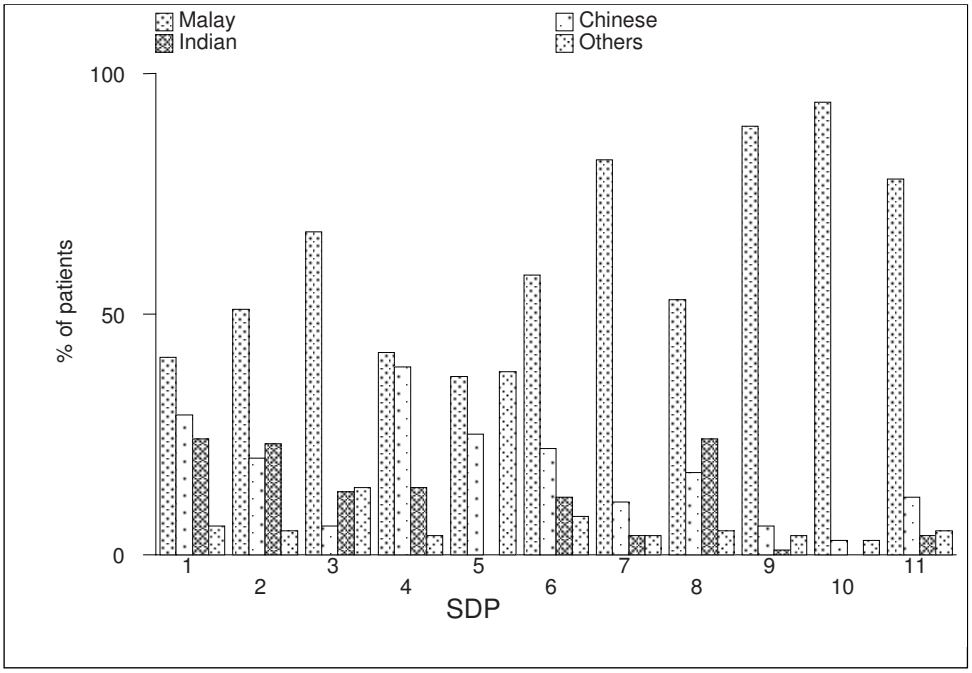


Table 2.2.4 SDP-gender distribution of patients with ACS, Malaysia 2006 (row percent)

	SDP	Gender					
		Male		Female		Total	
		No.	%	No.	%	No.	%
1	University Malaya Medical Centre	588	73	214	27	802	100
2	National Heart Institute	357	78	99	22	456	100
3	Kuala Lumpur Hospital	329	80	84	20	413	100
4	Penang Hospital	366	76	116	24	482	100
5	Sarawak General Hospital	263	70	112	30	375	100
6	Sultanah Aminah Hospital	212	88	30	12	242	100
7	Sultanah Bahiyah Hospital	103	64	57	36	160	100
8	Tuanku Ja'afar Hospital	77	53	69	47	146	100
9	Tuanku Fauziah Hospital	45	85	8	15	53	100
10	Raja Perempuan Zainab II Hospital	109	77	32	23	141	100
11	Tengku Ampuan Afzan Hospital	120	79	32	21	152	100

Note: Percentage is to the nearest decimal point.

Figure 2.2.4 SDP-gender distribution of patients with ACS, Malaysia 2006

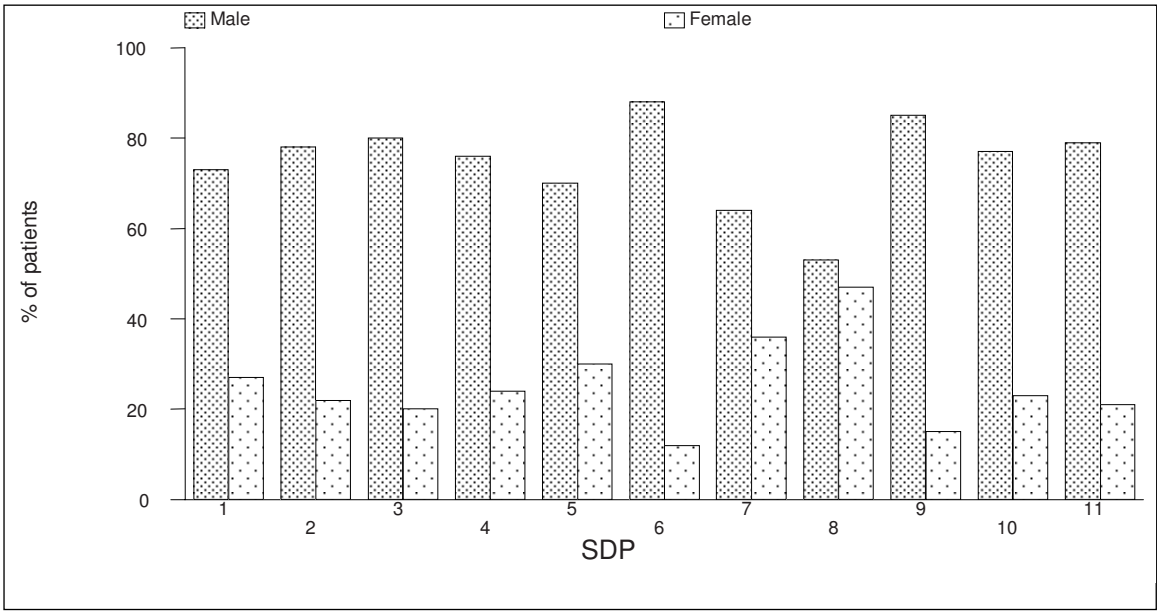


Table 2.2.5: SDP-gender distribution of patients admitted to participating sites, Malaysia 2006 (row percent)

	SDP	Gender					
		Male		Female		Total	
		No.	%	No.	%	No.	%
1	University Malaya Medical Centre	16233	40	24350	60	40395	100
2	National Heart Institute	3134	30	7300	70	10434	100
3	Kuala Lumpur Hospital	3970	34	7630	66	11600	100
4	Penang Hospital	19382	45	23529	55	42911	100
5	Sarawak General Hospital	9704	29	23405	71	33109	100
6	Sultanah Aminah Hospital	22690	35	41903	65	64593	100
7	Sultanah Bahiyah Hospital	6368	36	11124	64	17492	100
8	Tuanku Ja'afar Hospital	15202	35	28448	65	43650	100
9	Tuanku Fauziah Hospital	11036	42	14962	58	25998	100
10	Raja Perempuan Zainab II Hospital	14312	36	25810	64	40122	100
11	Tengku Ampuan Afzan Hospital	11532	36	20609	64	32141	100

[+] *Patients age > 20 years old only*

Note: Percentage is to the nearest decimal point.

Figure 2.2.5: SDP-gender distribution of patients admitted to participating sites, Malaysia 2006

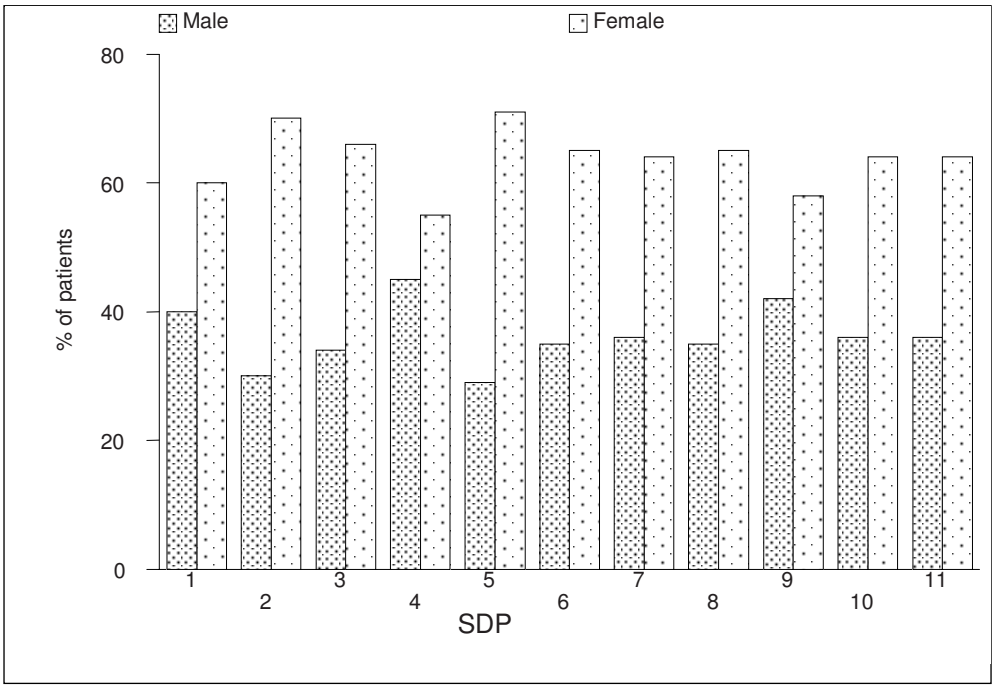


Table 2.3 Age-gender distribution for patients with ACS, Malaysia 2006

Age group	Gender			
	Male		Female	
	No.	%	No.	%
20 - <30	22	1	1	0
30 - <40	131	5	12	1
40 - <50	541	21	80	9
50 - <60	888	35	166	19
60 - <70	616	24	265	31
70 - <80	306	12	265	31
≥80	65	3	64	8
Total	**2569**	**100**	**853**	**100**

Note: Percentage is to the nearest decimal point.

Figure 2.3 Age-gender distribution for patients with ACS, Malaysia 2006

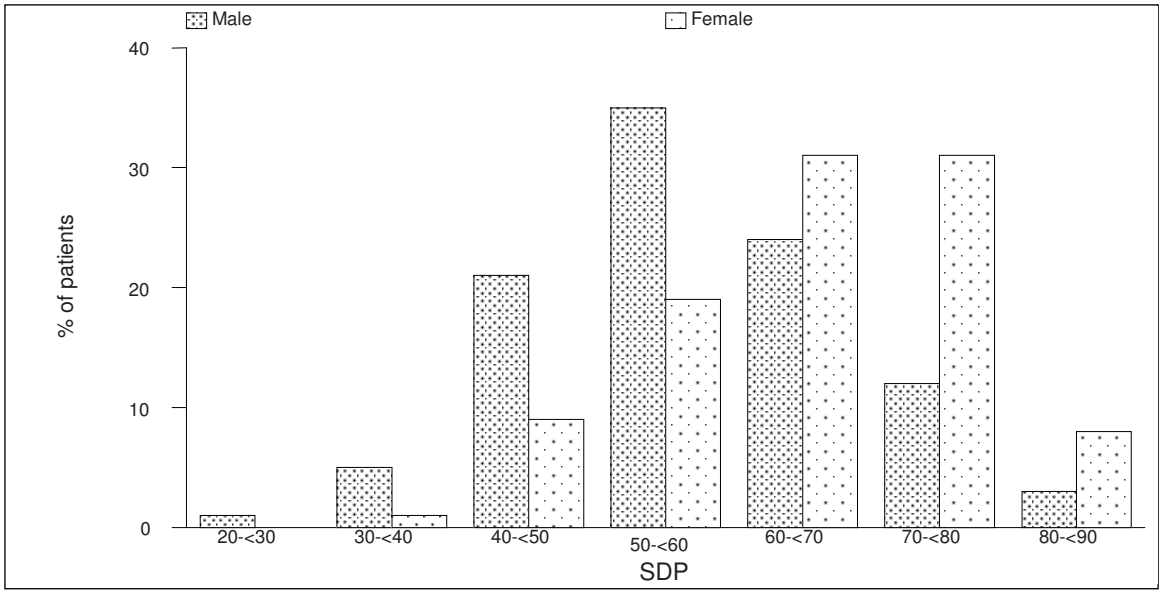


Table 2.3.1 Age-gender distribution for patients with ACS by ethnic group, Malaysia 2006

Gender	Age group	Ethnic group							
		Malay		Chinese		Indian		Others*	
		No.	%	No.	%	No.	%	No.	%
Men	20 - <30	10	1	5	1	5	1	2	2
	30 - <40	67	5	25	4	28	5	11	9
	40 - <50	286	22	91	16	133	23	31	26
	50 - <60	445	34	183	33	227	39	33	28
	60 - <70	324	25	137	24	130	22	25	21
	70 - <80	148	11	95	17	48	8	15	13
	≥80	24	2	25	4	15	3	1	1
	Total	**1304**	**100**	**561**	**100**	**586**	**100**	**118**	**100**
Women	20 - <30	1	0	0	0	0	0	0	0
	30 - <40	5	1	3	1	4	2	0	0
	40 - <50	41	11	7	3	32	15	0	0
	50 - <60	88	23	28	12	45	21	5	14
	60 - <70	117	31	68	30	62	29	18	51
	70 - <80	111	29	91	40	53	25	10	29
	≥80	17	4	28	12	17	8	2	6
	Total	**380**	**100**	**225**	**100**	**213**	**100**	**35**	**100**

**Others includes Orang asli, Kadazan, Melanau, Murut, Bajau, Bidayuh, Iban, other Malaysian and foreigner*

Note: Percentage is to the nearest decimal point.

Figure 2.3.1a Age-gender distribution male patients with ACS by ethnic group, Malaysia 2006

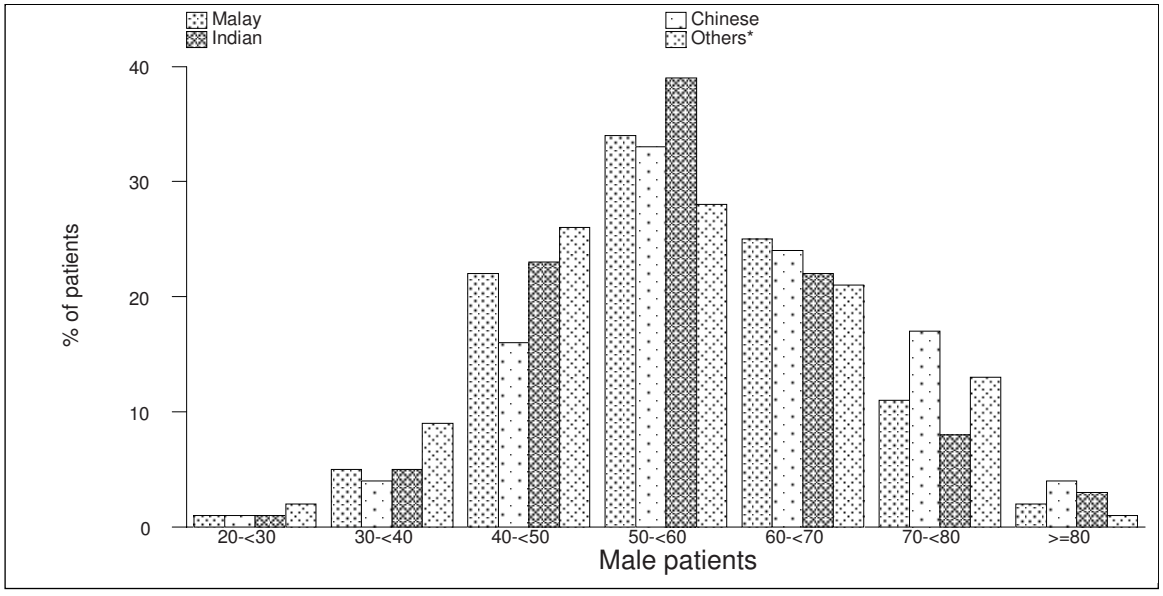


Figure 2.3.1b Age-gender distribution for female patients with ACS by ethnic group, Malaysia 2006

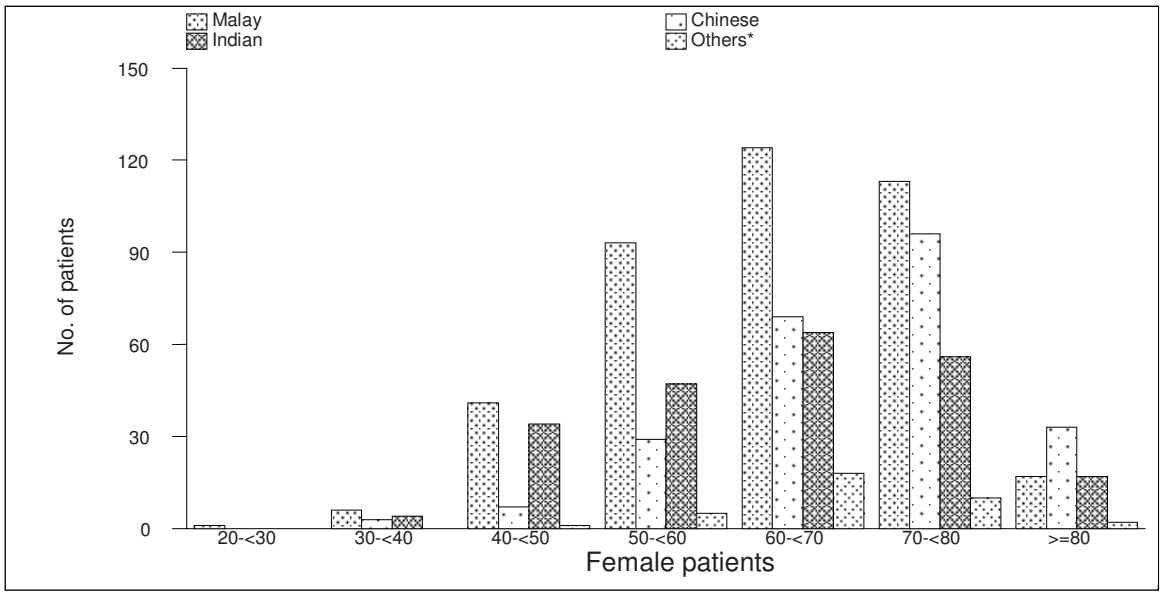


Table 2.3.2 Age-gender distribution for patients with ACS by pre-morbid diabetes, Malaysia 2006

Gender	Age group	Pre-morbid diabetes					
		Diabetic		Non-diabetic		Not known	
		No.	%	No.	%	No.	%
Male	20 - <30	1	0	15	2	6	1
	30 - <40	31	3	58	6	42	7
	40 - <50	194	19	212	22	135	23
	50 - <60	402	39	291	30	195	33
	60 - <70	262	26	224	23	130	22
	70 - <80	114	11	129	13	63	11
	≥80	18	2	32	3	15	3
	Total	**1022**	**100**	**961**	**100**	**586**	**100**
Female	20 - <30	0	0	0	0	1	1
	30 - <40	5	1	3	1	4	4
	40 - <50	44	9	23	9	13	12
	50 - <60	97	20	45	17	24	21
	60 - <70	149	31	83	31	33	29
	70 - <80	154	32	86	32	25	22
	≥80	26	5	25	9	13	12
	Total	**475**	**100**	**265**	**100**	**113**	**100**

Note: Percentage is to the nearest decimal point.

Figure 2.3.2a Age-gender distribution for male patients with ACS by pre-morbid diabetes, Malaysia 2006

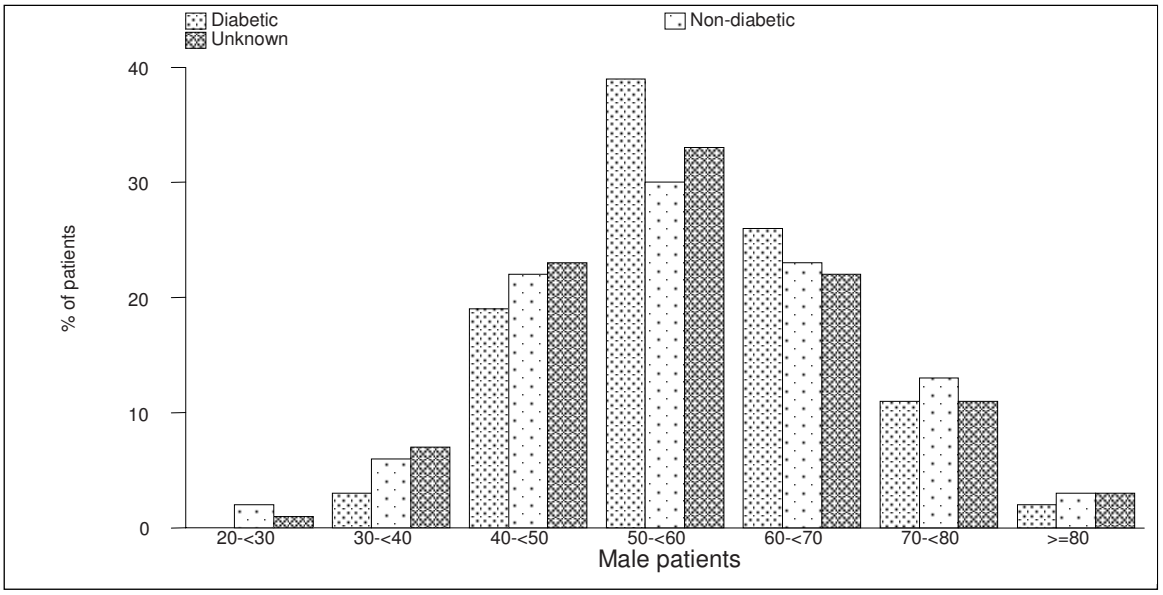


Figure 2.3.2b Age-gender distribution for female patients with ACS by pre-morbid diabetes, Malaysia 2006

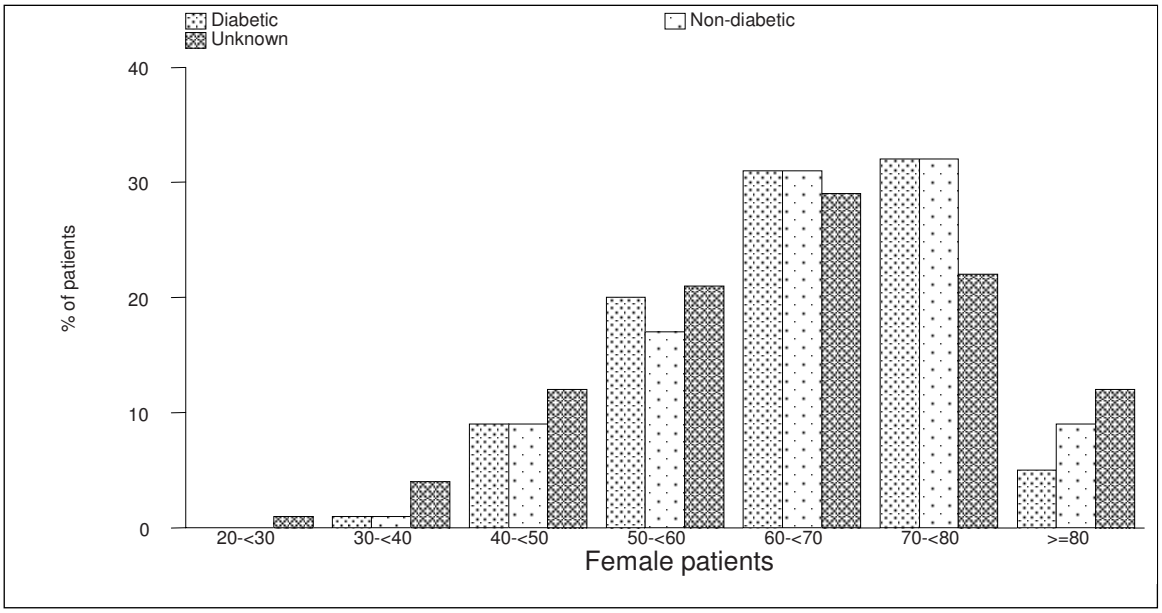


Table 2.3.3 Age-gender distribution for patients with ACS by pre-morbid hypertension, Malaysia 2006

Gender	Age group	Pre-morbid hypertension					
		Hypertensive		Non-hypertensive		Not known	
		No.	%	No.	%	No.	%
Male	20 - <30	2	0	15	2	5	1
	30 - <40	37	3	55	8	39	8
	40 - <50	235	17	178	26	128	27
	50 - <60	514	36	229	34	145	31
	60 - <70	394	28	125	18	97	21
	70 - <80	197	14	63	9	46	10
	≥80	39	3	16	2	10	2
	Total	**1418**	**100**	**681**	**100**	**470**	**100**
Female	20 - <30	0	0	0	0	1	1
	30 - <40	5	1	3	3	4	5
	40 - <50	52	8	14	13	14	17
	50 - <60	129	19	23	22	14	17
	60 - <70	214	32	32	30	19	23
	70 - <80	212	32	27	26	26	32
	≥80	54	8	6	6	4	5
	Total	**666**	**100**	**105**	**100**	**82**	**100**

Note: Percentage is to the nearest decimal point.

Figure 2.3.3a Age-gender distribution for male patients with ACS by pre-morbid hypertension, Malaysia 2006

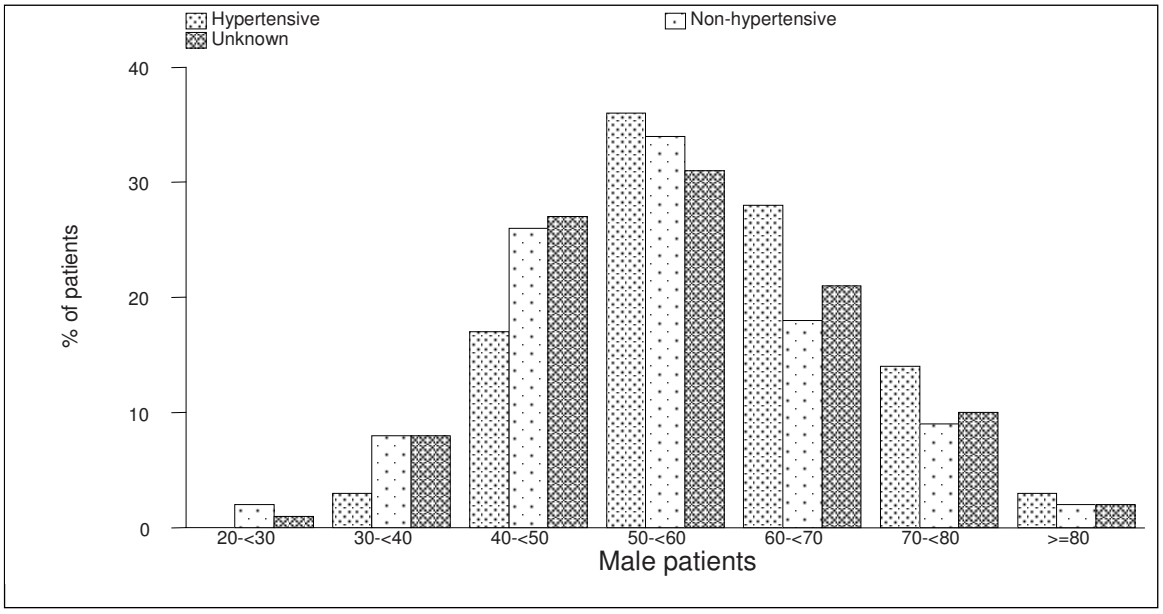


Figure 2.3.3b Age-gender distribution for female patients with ACS by pre-morbid hypertension, Malaysia 2006

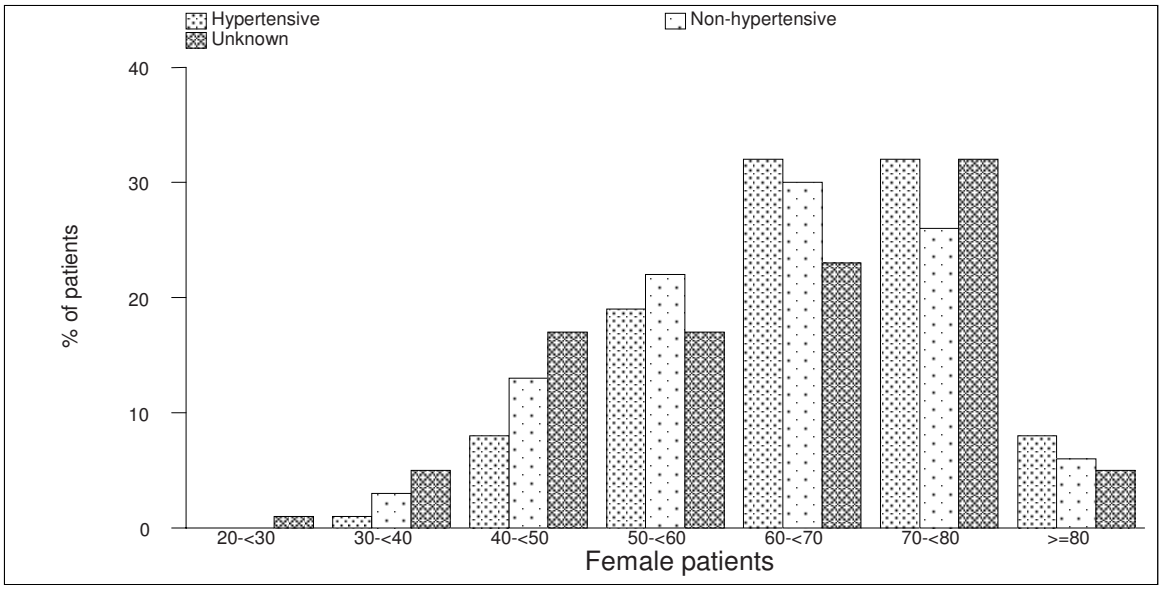


Table 2.3.4 Age-gender distribution for patients with ACS by pre-morbid dyslipidaemia, Malaysia 2006

Gender	Age group	Pre-morbid dyslipidaemia					
		Yes		No		Not known	
		No.	%	No.	%	No.	%
Male	20 - <30	2	0	11	2	9	1
	30 - <40	28	4	44	6	59	5
	40 - <50	145	18	152	22	244	23
	50 - <60	270	34	229	33	389	36
	60 - <70	239	30	140	20	237	22
	70 - <80	98	12	91	13	117	11
	≥80	15	2	22	3	28	3
	Total	**797**	**100**	**689**	**100**	**1083**	**100**
Female	20 - <30	0	0	0	0	1	0
	30 - <40	2	1	1	0	9	3
	40 - <50	27	8	24	11	29	9
	50 - <60	66	20	48	23	52	17
	60 - <70	108	32	64	30	93	30
	70 - <80	116	35	54	25	95	31
	≥80	15	4	22	10	27	9
	Total	**334**	**100**	**213**	**100**	**306**	**100**

Note: Percentage is to the nearest decimal point.

Figure 2.3.4a Age-gender distribution for male patients with ACS by pre-morbid dyslipidaemia, Malaysia 2006

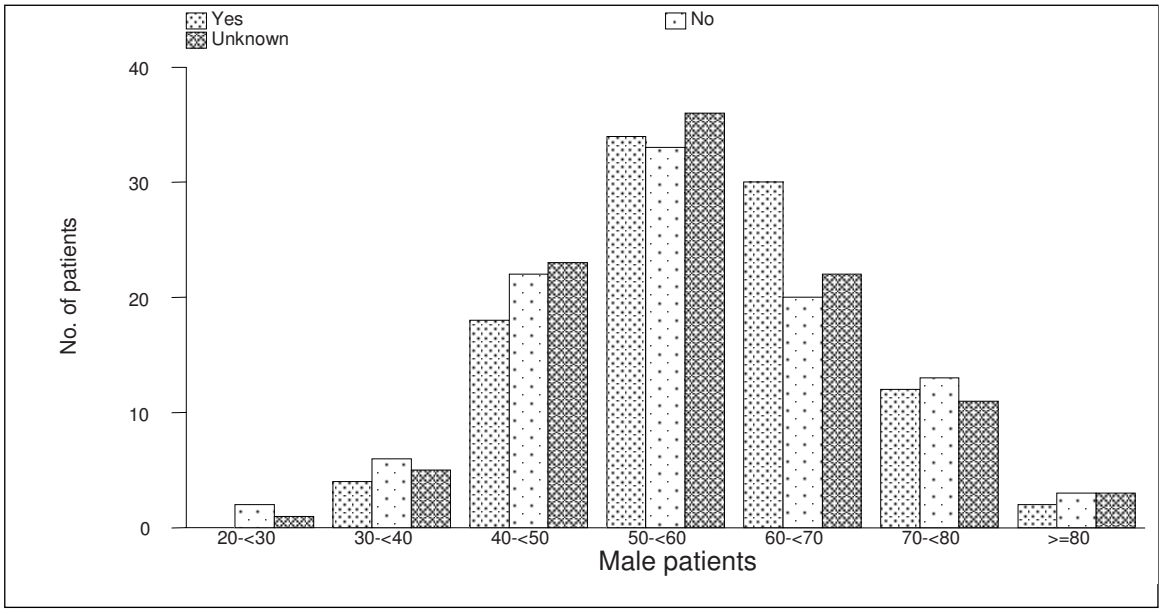


Figure 2.3.4b Age-gender distribution for female patients with ACS by pre-morbid dyslipidaemia, Malaysia 2006

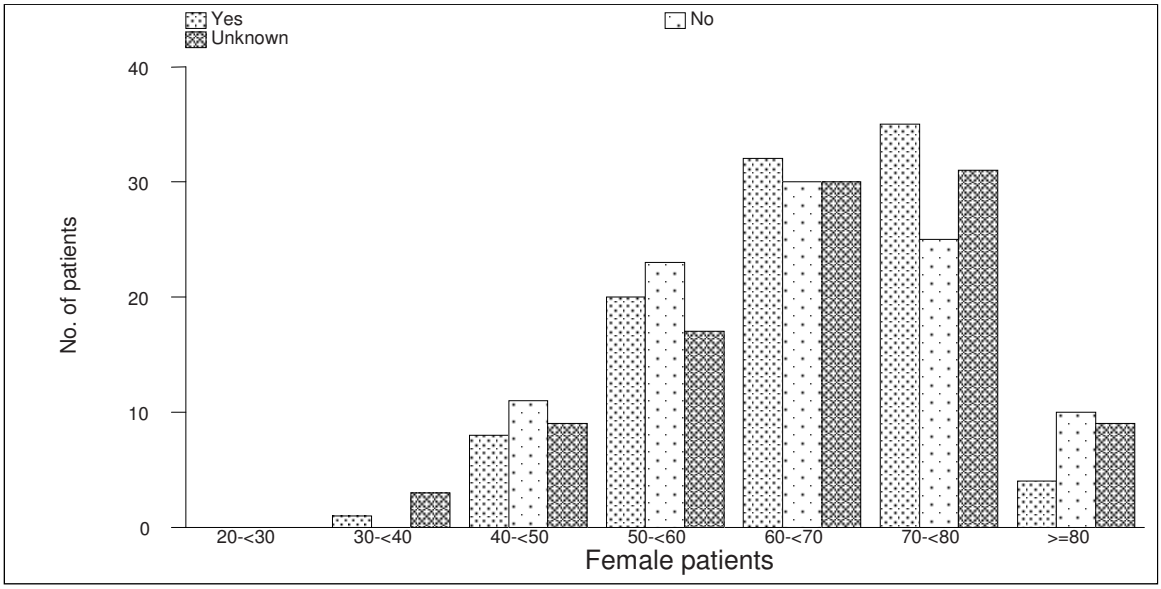


Table 2.3.5 Age-gender distribution for patients with ACS by family history, Malaysia 2006

Gender	Age group	Family history of premature cardiovascular disease					
		Yes		No		Not known	
		No.	%	No.	%	No.	%
Male	20 - <30	3	1	13	1	6	1
	30 - <40	36	11	55	4	40	4
	40 - <50	93	28	250	20	198	20
	50 - <60	130	39	394	32	364	36
	60 - <70	58	17	310	25	248	25
	70 - <80	14	4	176	14	116	12
	≥80	2	1	37	3	26	3
	Total	**336**	**100**	**1235**	**100**	**998**	**100**
Female	20 - <30	0	0	0	0	1	0
	30 - <40	2	3	2	0	8	2
	40 - <50	22	32	33	7	25	7
	50 - <60	14	21	86	19	66	20
	60 - <70	17	25	155	35	93	28
	70 - <80	12	18	138	31	115	34
	≥80	1	1	35	8	28	8
	Total	**68**	**100**	**449**	**100**	**336**	**100**

Note: Percentage is to the nearest decimal point.

Figure 2.3.5a Age-gender distribution for male patients with ACS by family history, Malaysia 2006

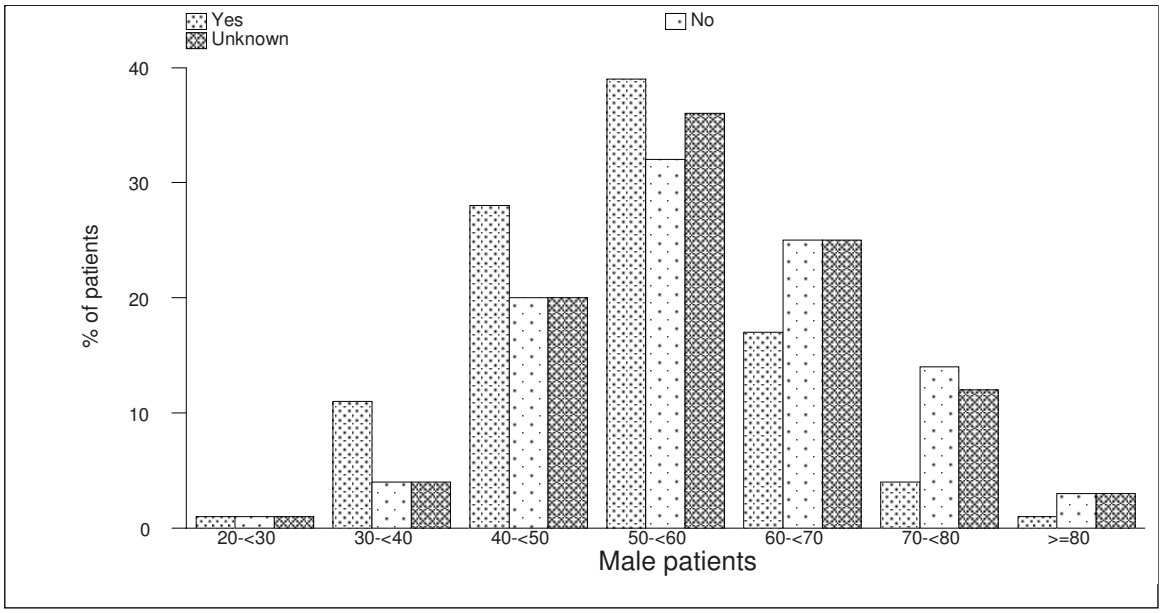


Figure 2.3.5b Age-gender distribution for female patients with ACS by family history, Malaysia 2006

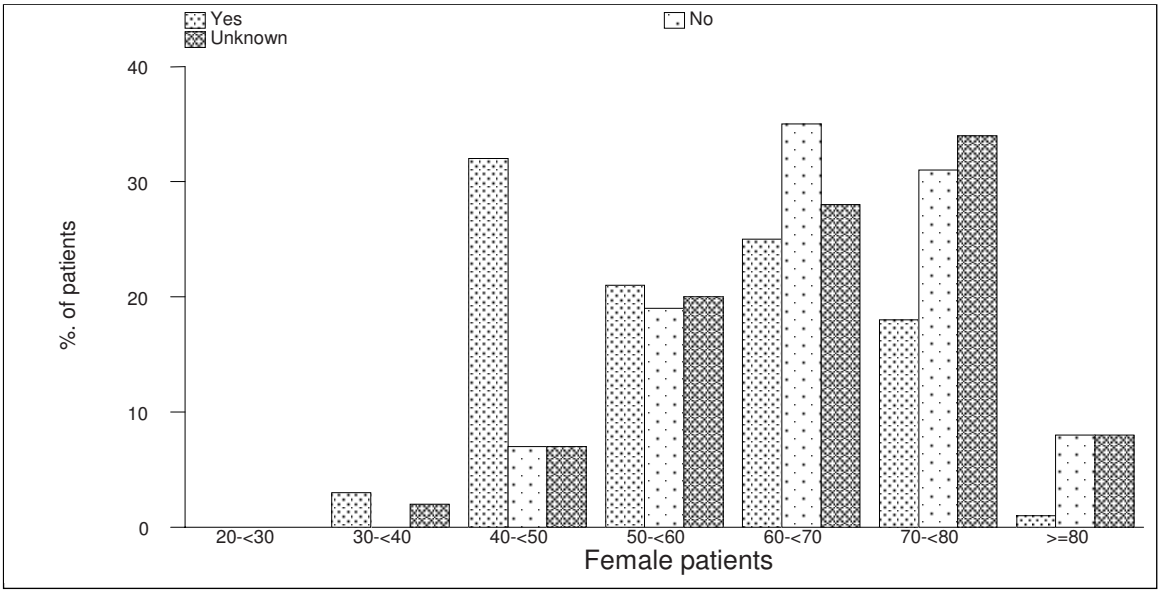


Table 2.3.6 Age-gender distribution for patients with ACS by smoking status, Malaysia 2006

Gender	Age group	Smoking status							
		Never		Former (quit more than 30 days)		Current (any tobacco use within last 30 days)		Unknown	
		No.	%	No.	%	No.	%	No.	%
Male	20 - <30	2	0	1	0	19	2	0	0
	30 - <40	12	2	19	3	97	9	3	3
	40 - <50	112	18	103	14	316	28	10	11
	50 - <60	205	33	249	33	397	36	37	43
	60 - <70	189	31	205	27	198	18	24	28
	70 - <80	82	13	138	18	75	7	11	13
	≥80	16	3	38	5	9	1	2	2
	Total	**618**	**100**	**753**	**100**	**1111**	**100**	**87**	**100**
Female	20 - <30	0	0	0	0	1	4	0	0
	30 - <40	12	2	0	0	0	0	0	0
	40 - <50	75	10	2	4	2	7	1	5
	50 - <60	148	20	6	12	5	19	7	32
	60 - <70	234	31	18	35	10	37	3	14
	70 - <80	229	30	17	33	8	30	11	50
	≥80	54	7	9	17	1	4	0	0
	Total	**752**	**100**	**52**	**100**	**27**	**100**	**22**	**100**

Note: Percentage is to the nearest decimal point.

Figure 2.3.6a Age-gender distribution for male patients with ACS by smoking status, Malaysia 2006

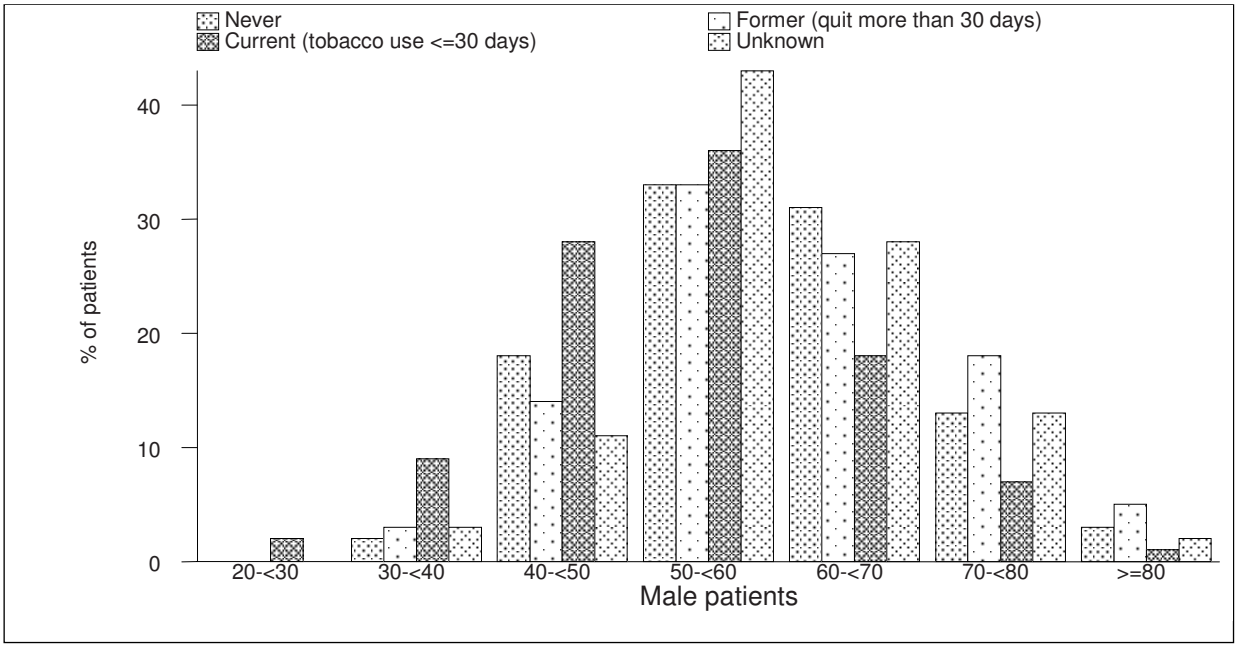


Figure 2.3.6b Age-gender distribution for female patients with ACS by smoking status, Malaysia 2006

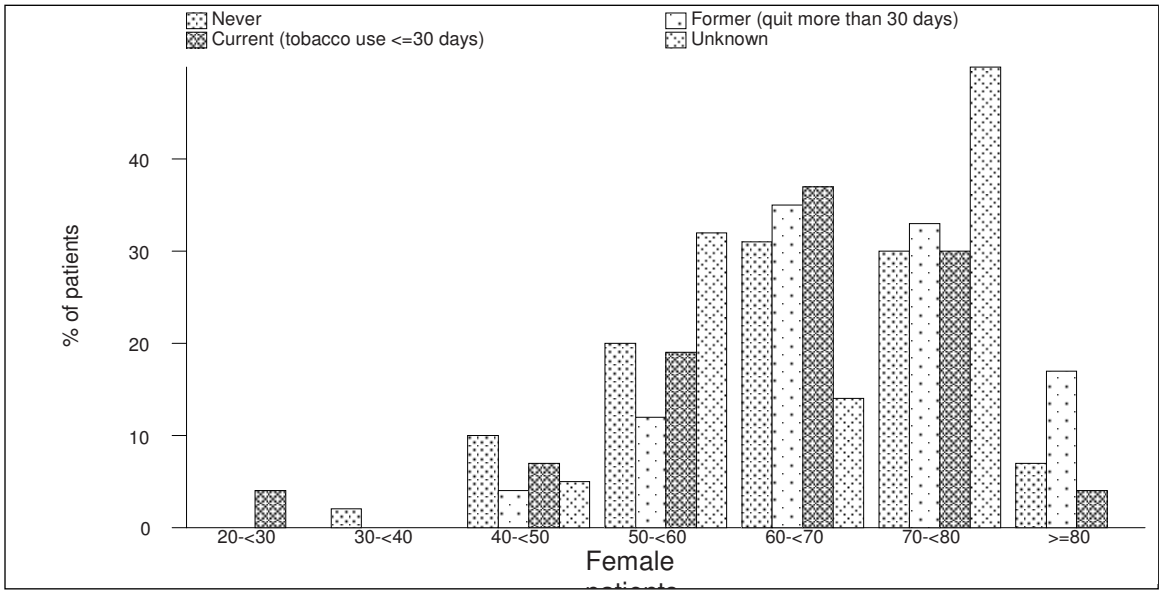


Table 2.4 Pre-morbid distribution for patients with ACS, Malaysia 2006

		Dyslipidaemia																	
		Yes						No						Not known					
		Hypertension						Hypertension						Hypertension					
		Yes		No		Unknown		Yes		No		Unknown		Yes		No		Unknown	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Diabetes	Yes	540	16	65	2	29	1	231	7	119	3	2	0	373	11	54	2	84	2
	No	280	8	104	3	1	0	241	7	296	9	0	0	163	5	121	4	20	1
	Unknown	73	2	2	0	37	1	8	0	3	0	2	0	175	5	22	1	377	11

*** The percentage is based on the grand total (N=3422)*

Note: Percentage is to the nearest decimal point.

Figure 2.4a Pre-morbid distribution for diabetic patients with ACS, Malaysia 2006

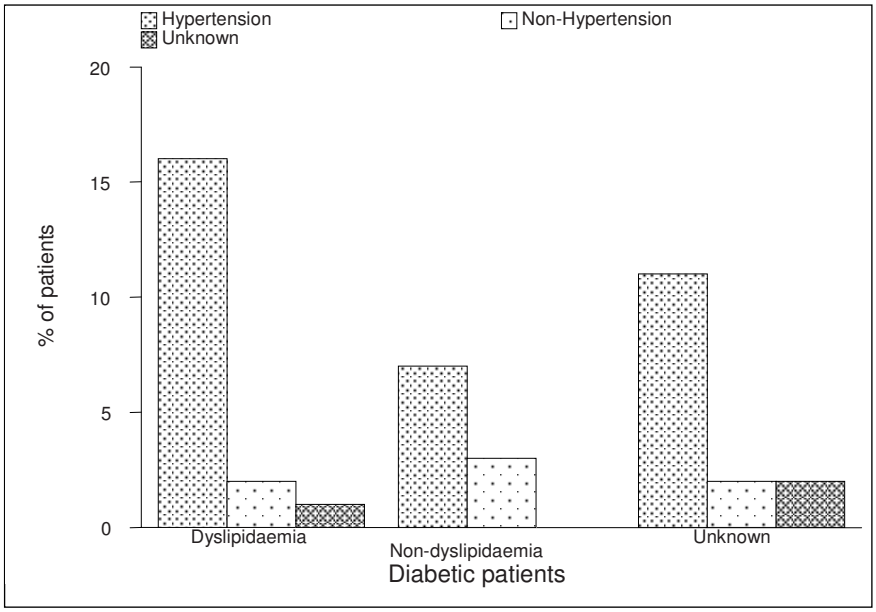


Figure 2.4b Pre-morbid distribution for non-diabetic patients with ACS, Malaysia 2006

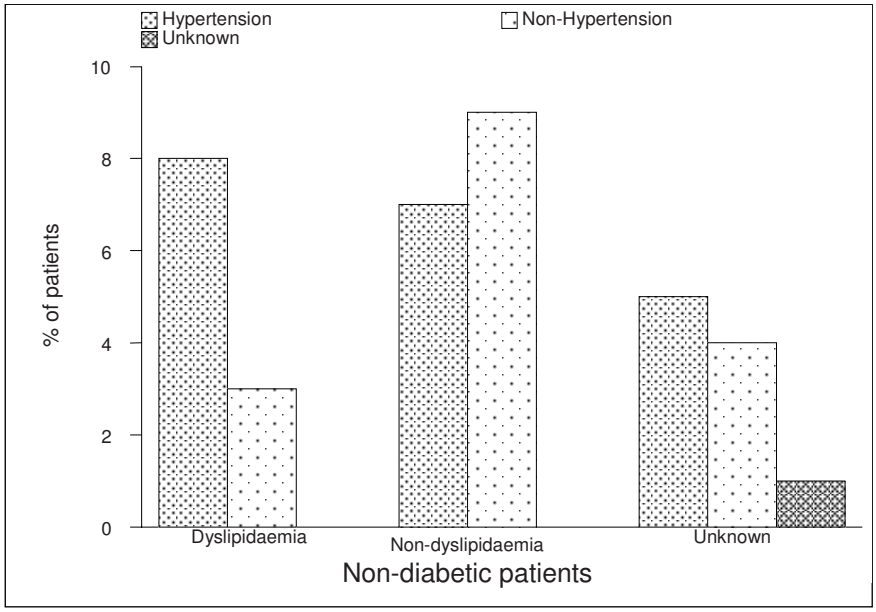


Table 2.5 Presence of cumulative risk factors

Presence of cumulative Risk factors *	**Total=3422**	
	No.	**%**
None	143	4
1 risk factor	634	19
2 risk factor	987	29
3 risk factor	938	27
> 3 risk factor	720	21

** Risk factors are defined as presence of dyslipidaemia, hypertension, diabetes, family history of premature cardiovascular disease, smoking, and obesity.*

Note: Percentage is to the nearest decimal point.

Figure 2.5 Distribution of presence of cumulative risk factors

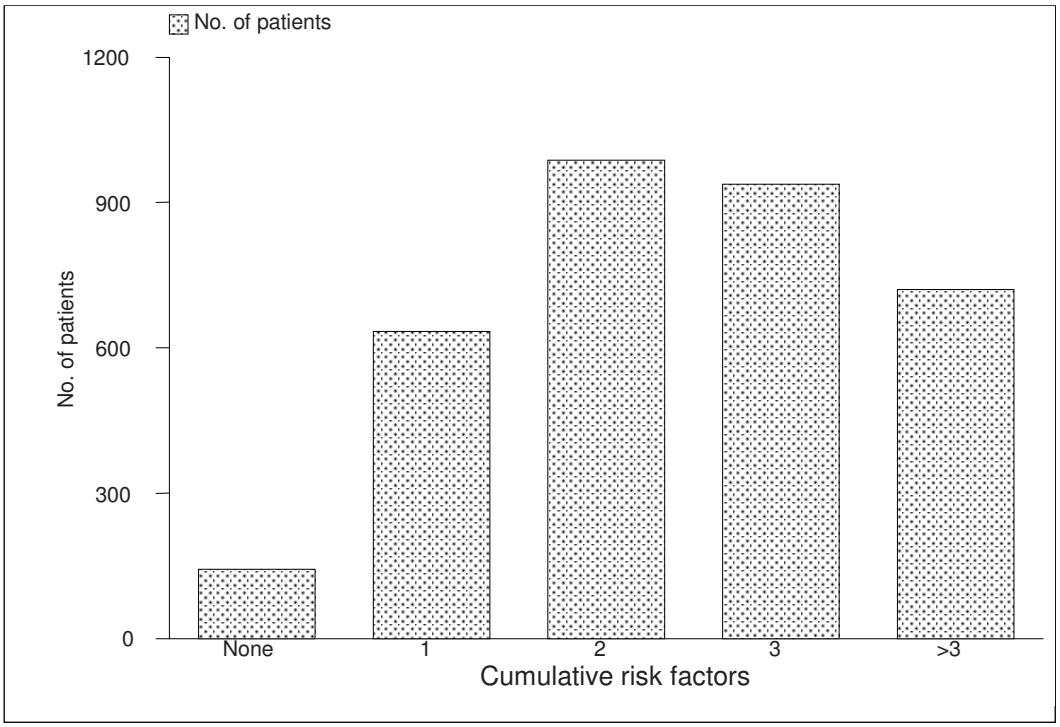


Table 2.6 Summary of type of cardiac presentation for patients with ACS, Malaysia 2006

	Total=3422
Acute coronary syndrome stratum, no. %	
• STEMI	1445 (42)
• NSTEMI	1132 (33)
• UA	845 (25)

Note: Percentage is to the nearest decimal point.

Figure 2.6 Stratum distribution for patients with ACS, Malaysia 2006

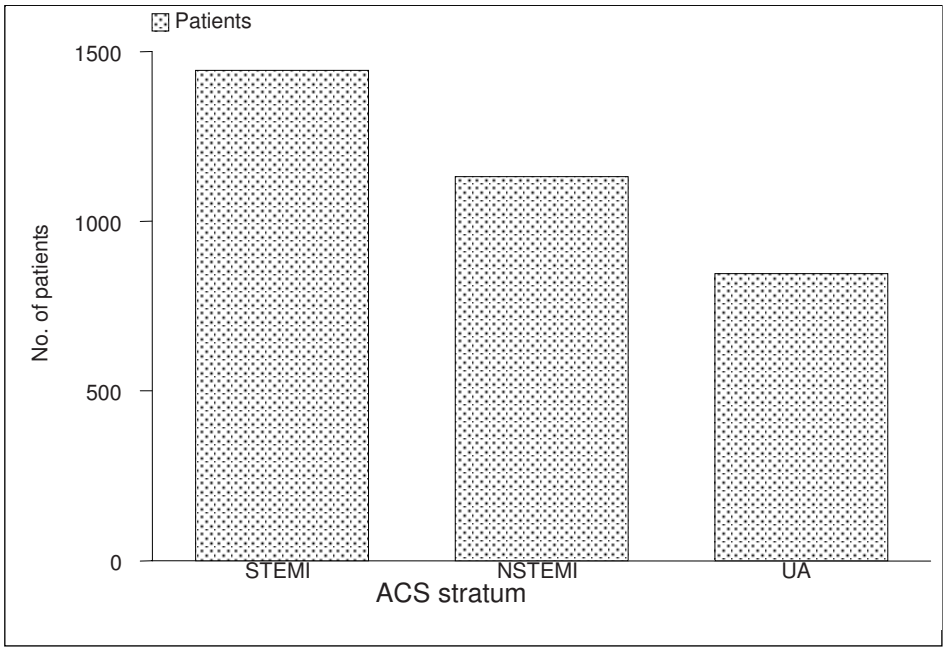


Table 2.7 Characteristics of patients with ACS by ACS stratum, Malaysia 2006

	STEMI N=1445	NSTEMI N=1132	UA N=845
1. DEMOGRAPHICS			
1.1 Age, years			
• Mean, SD	56 (12)	62 (11)	60 (11)
• Median (min, max)	56 (21, 93)	63 (23, 100)	60 (32, 92)
1.2 Age group, no. %			
• 20 - <30	22 (2)	1 (0)	0 (0)
• 30 - <40	91 (6)	27 (2)	25 (3)
• 40 - <50	343 (24)	139 (12)	139 (16)
• 50 - <60	460 (32)	330 (29)	264 (31)
• 60 - <70	318 (22)	334 (30)	229 (27)
• 70 - <80	180 (12)	244 (22)	147 (17)
• ≥80	31 (2)	57 (5)	41 (5)
1.3 Gender, no. %			
• Male	1230 (85)	779 (69)	560 (66)
• Female	215 (15)	353 (31)	285 (34)
1.4 Ethnic group, no. %			
• Malay	780 (54)	514 (45)	390 (46)
• Chinese	301 (21)	265 (23)	220 (26)
• Indian	286 (20)	303 (27)	210 (25)
• Orang Asli	0 (0)	0 (0)	0 (0)
• Kadazan	1 (0)	1 (0)	0 (0)
• Melanau	0 (0)	0 (0)	0 (0)
• Murut	0 (0)	0 (0)	0 (0)
• Bajau	1 (0)	0 (0)	0 (0)
• Bidayuh	16 (1)	9 (1)	3 (0)
• Iban	21 (1)	19 (2)	8 (1)
• Other Malaysian	12 (1)	14 (1)	11 (1)
• Foreigner	27 (2)	7 (1)	3 (0)
2. OTHER CORONARY RISK FACTORS			
2.1 Smoking, no. %			
• Never	417 (29)	551 (49)	402 (48)
• Former (quit >30 days)	272 (19)	295 (26)	238 (28)
• Current (any tobacco use within last 30 days)	723 (50)	259 (23)	156 (18)
• Unknown	33 (2)	27 (2)	49 (6)
2.2 Family history of premature cardiovascular disease, no. %			
• Yes	168 (12)	127 (11)	109 (13)
• No	742 (51)	550 (49)	392 (46)
• Not known	535 (37)	455 (40)	344 (41)

	STEMI N=1445	NSTEMI N=1132	UA N=845
2.3 Antropometric			
BMI			
• N	831	698	397
• Mean, SD	25.69 (4.27)	25.45 (4.37)	26.46 (4.81)
• Median, (min, max)	25.14 (13.15, 60.39)	25.05 (14.87, 59.94)	25.806 (14.872, 45.986)
BMI, kg/m^2, no. %			
• <18.5	21 (3)	24 (3)	13 (3)
• 18.5-23	181 (22)	174 (25)	71 (18)
• > 23	629 (76)	500 (72)	313 (79)
WHR			
• N	643	454	297
• Mean, SD	0.97 (0.08)	0.97 (0.09)	0.96 (0.10)
• Median, (min, max)	0.96 (0.54, 1.63)	0.96 (0.67, 1.61)	0.96 (0.46, 1.85)
WHR, no. %			
• Men	550	329	212
• ≤ 1.0	405 (74)	230 (70)	151 (71)
• >1.0	145 (26)	99 (30)	61 (29)
• Women	93	125	85
• ≤ 0.85	9 (10)	18 (14)	8 (9)
• >0.85	84 (90)	107 (86)	77 (91)
Waist circumference, cm			
• N	690	494	318
• Mean, SD	88.8 (14.1)	89.6 (14.9)	91.7 (14.1)
• Median, (min, max)	90.0 (36.0, 131.0)	90.0 (36.0, 160.0)	92.0 (37.5, 152.0)
Waist circumference, cm, no. %			
• Men	592	350	220
• ≤ 90	307 (52)	184 (53)	95 (43)
• > 90	285 (48)	166 (47)	125 (57)
• Women	98	144	98
• ≤ 80	20 (20)	30 (21)	18 (18)
• > 80	78 (80)	114 (79)	80 (82)
2.4 Co-morbidity			
Dyslipidaemia, no. %			
• Yes	278 (19)	464 (41)	389 (46)
• No	458 (32)	247 (22)	197 (23)
• Not known	709 (49)	421 (37)	259 (31)
Hypertension, no. %			
• Yes	681 (47)	789 (70)	614 (73)
• No	433 (30)	202 (18)	151 (18)
• Not known	331 (23)	141 (12)	80 (9)

	STEMI N=1445	NSTEMI N=1132	UA N=845
Diabetes, no. %			
• Yes	525 (36)	579 (51)	393 (47)
• No	538 (37)	364 (32)	324 (38)
• Not known	382 (26)	189 (17)	128 (15)
Fasting blood glucose, mmol/L			
• N	1149	812	600
• Mean (SD)	8.7 (4.0)	8.0 (4.0)	7.4 (3.7)
• Median (min, max)	7.1 (3.2, 29.8)	6.6 (3.0, 27.8)	6.1 (3.1, 29.9)
Myocardial infarction history, no. %			
• Yes	144 (10)	216 (19)	202 (24)
• No	876 (61)	579 (51)	392 (46)
• Not known	425 (29)	337 (30)	251 (30)
Documented CAD > 50% stenosis, no. %			
• Yes	74 (5)	230 (20)	204 (24)
• No	851 (59)	527 (47)	356 (42)
• Not known	520 (36)	375 (33)	285 (34)
Chronic angina (onset more than 2 weeks ago), no. %			
• Yes	103 (7)	189 (17)	210 (25)
• No	920 (64)	651 (58)	441 (52)
• Not known	422 (29)	292 (26)	194 (23)
New onset angina (less than 2 weeks), no. %			
• Yes	628 (43)	538 (48)	366 (43)
• No	479 (33)	378 (33)	303 (36)
• Not known	338 (23)	216 (19)	176 (21)
Heart failure, no. %			
• Yes	48 (3)	153 (14)	83 (10)
• No	1008 (70)	724 (64)	557 (66)
• Not known	389 (27)	255 (23)	205 (24)
Chronic lung disease, no. %			
• Yes	34 (2)	57 (5)	39 (5)
• No	1016 (70)	810 (72)	605 (72)
• Not known	395 (27)	265 (23)	201 (24)
Renal disease, no. %			
• Yes	58 (4)	142 (13)	53 (6)
• No	989 (68)	729 (64)	587 (69)
• Not known	398 (28)	261 (23)	205 (24)
Cerebrovascular disease, no. %			
• Yes	46 (3)	65 (6)	38 (4)
• No	1011 (70)	806 (71)	603 (71)
• Not known	388 (27)	261 (23)	204 (24)

	STEMI N=1445	NSTEMI N=1132	UA N=845
Peripheral vascular disease, no. %			
• Yes	4 (0)	25 (2)	8 (1)
• No	1040 (72)	830 (73)	622 (74)
• Not known	401 (28)	277 (24)	215 (25)
None of the above, no. %			
• Yes	125 (9)	36 (3)	18 (2)
• No	1320 (91)	1096 (97)	827 (98)
• Not known	0 (0)	0 (0)	0 (0)
Coronary artery disease*, no. %			
• Yes	779 (54)	787 (70)	633 (75)
• No	306 (21)	146 (13)	80 (9)
• Not known	360 (25)	199 (18)	132 (16)

**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.

Figure 2.7a Age group (years) distribution for patients with ACS by ACS stratum, Malaysia 2006

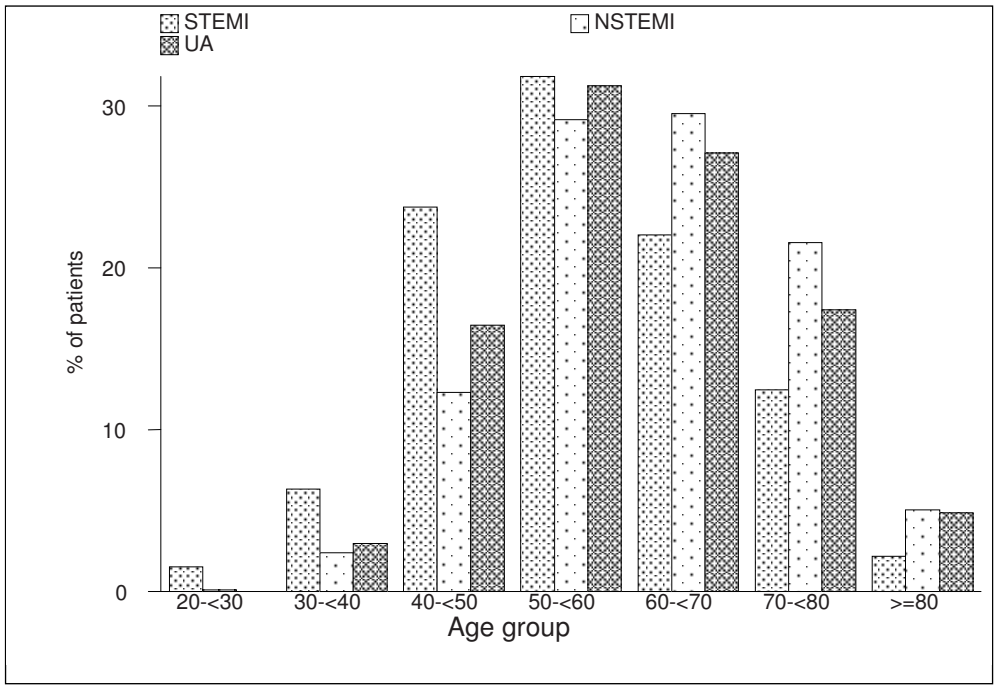


Figure 2.7b Gender distribution for patients with ACS by ACS stratum, Malaysia 2006

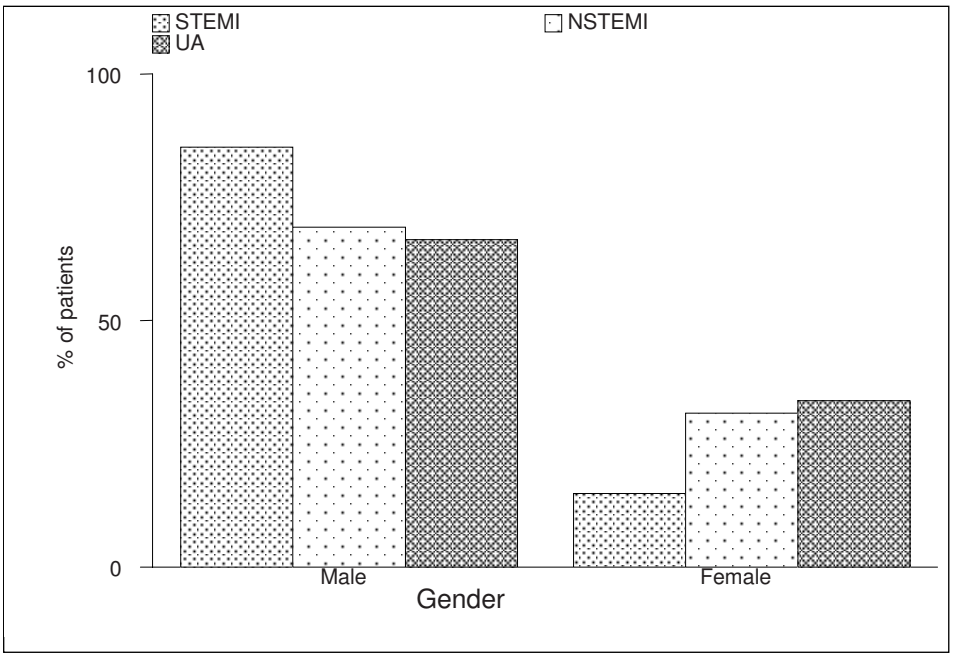


Figure 2.7c Ethnic group distribution for patients with ACS by ACS stratum, Malaysia 2006

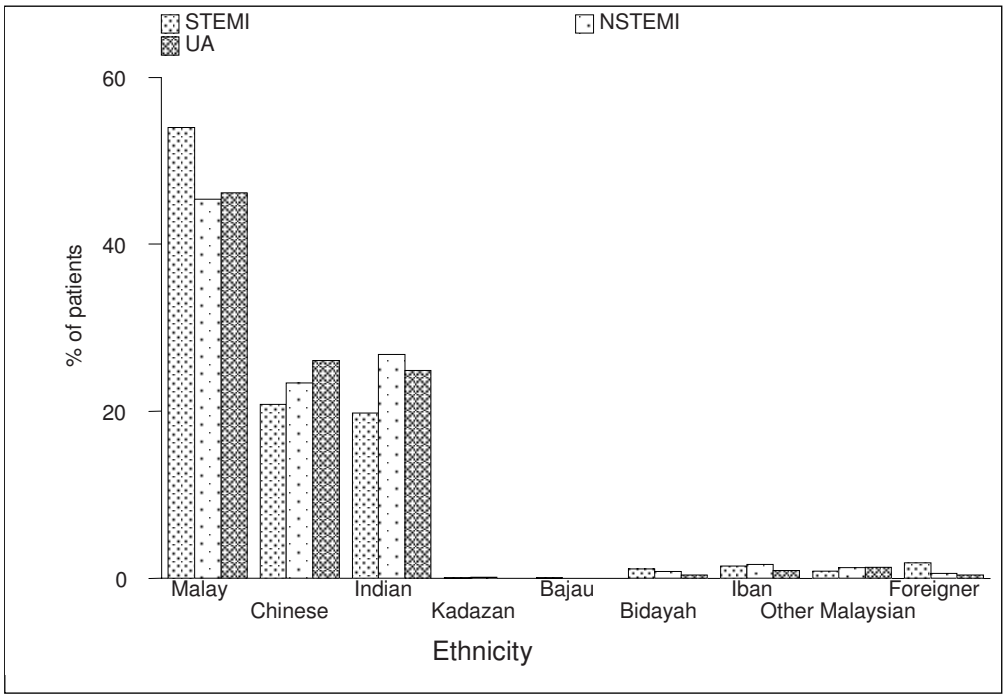


Figure 2.7d Smoking status for patients with ACS by ACS stratum, Malaysia 2006

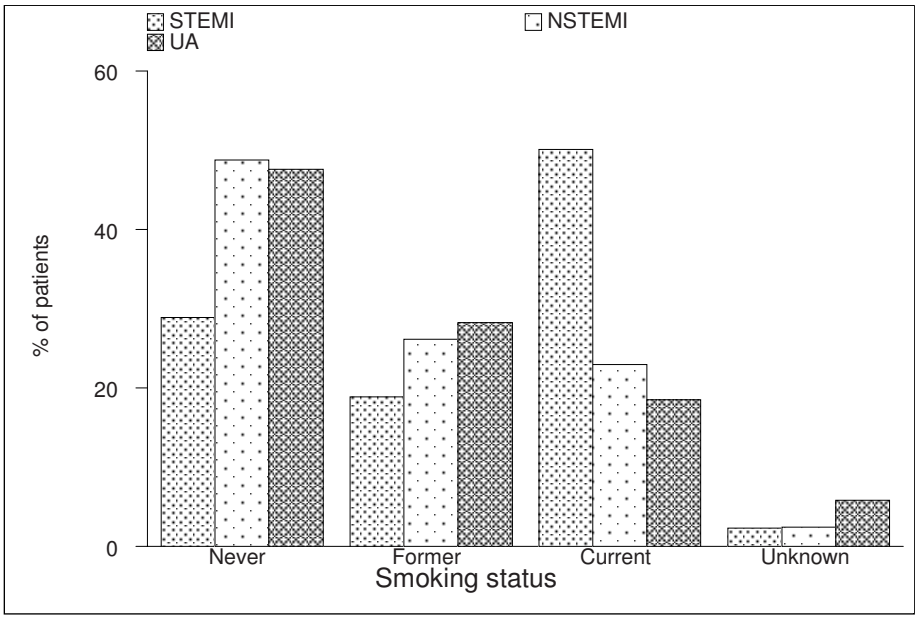


Figure 2.7e Family history of premature cardiovascular disease for patients with ACS by ACS stratum, Malaysia 2006

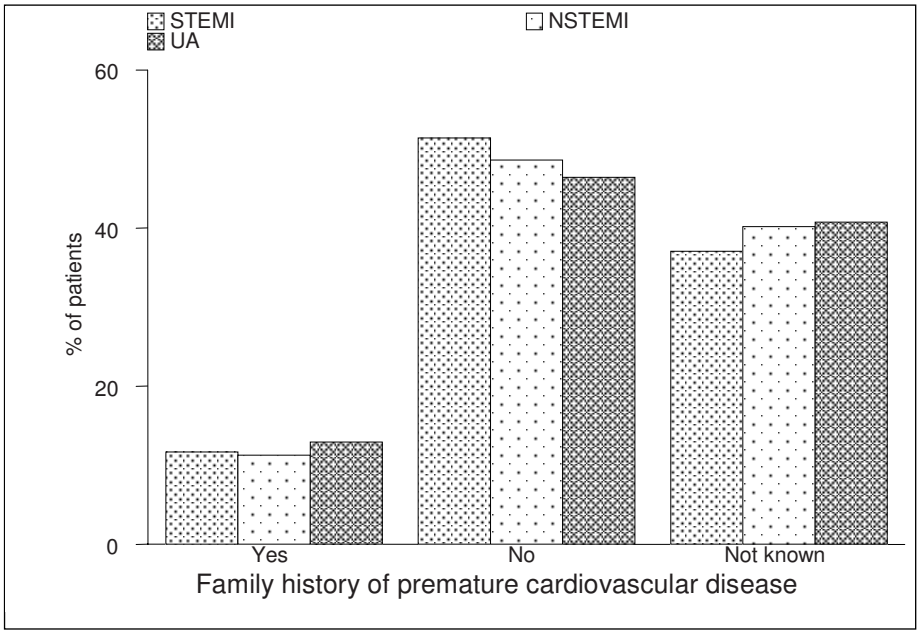


Figure 2.7f BMI for patients with ACS by ACS stratum, Malaysia 2006

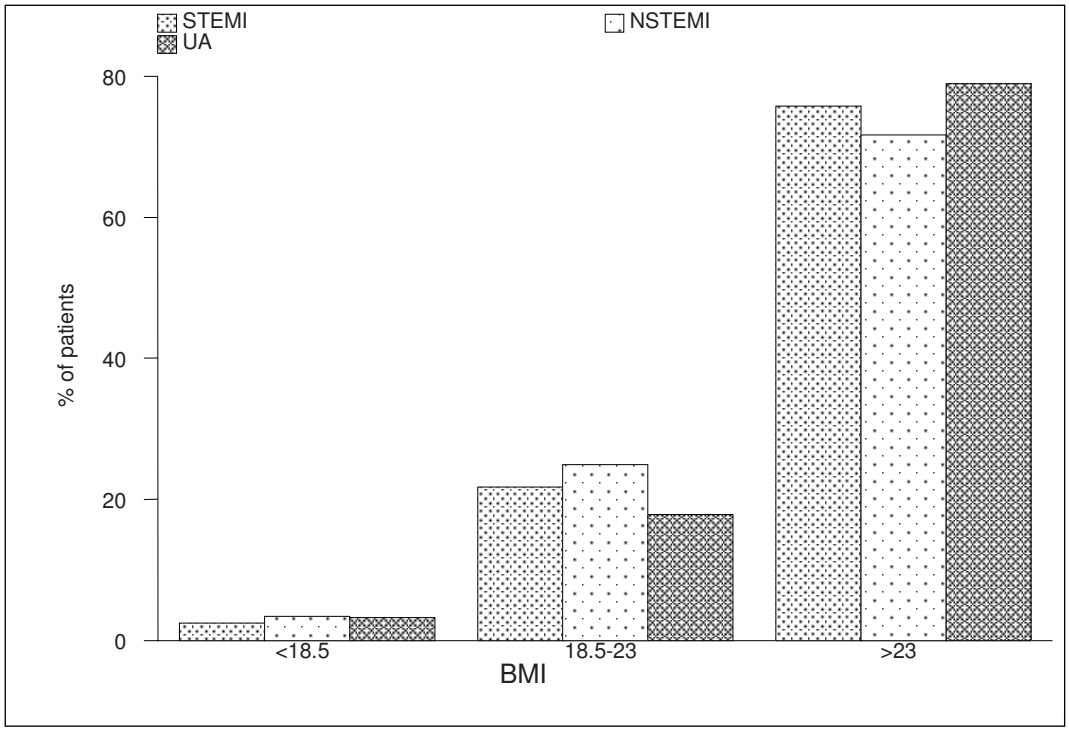


Figure 2.7g WHR for patients with ACS by ACS stratum, Malaysia 2006

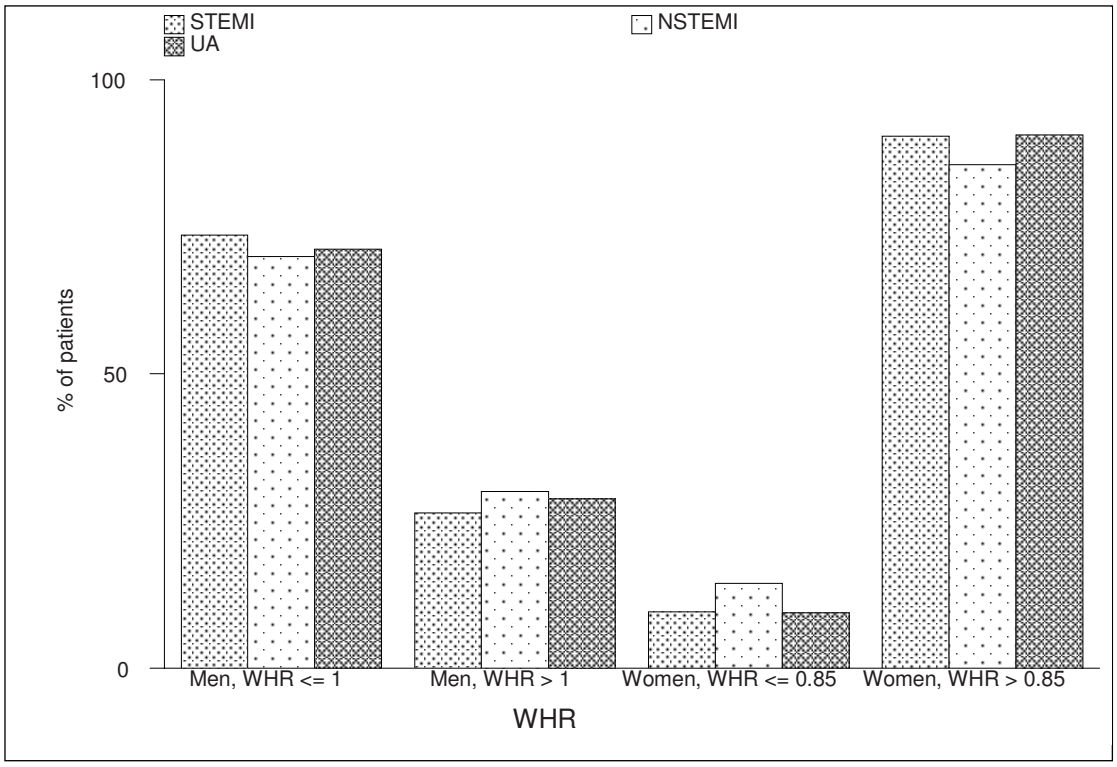


Figure 2.7h Waist circumference (cm) for patients with ACS by ACS stratum, Malaysia 2006

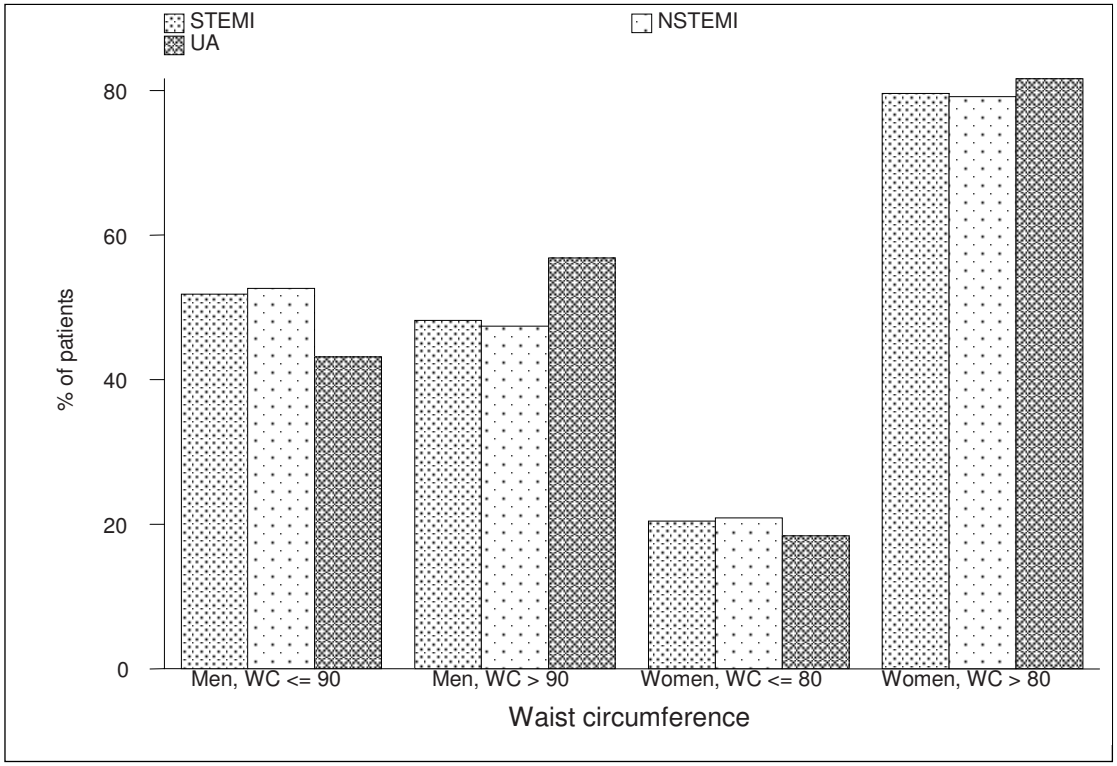
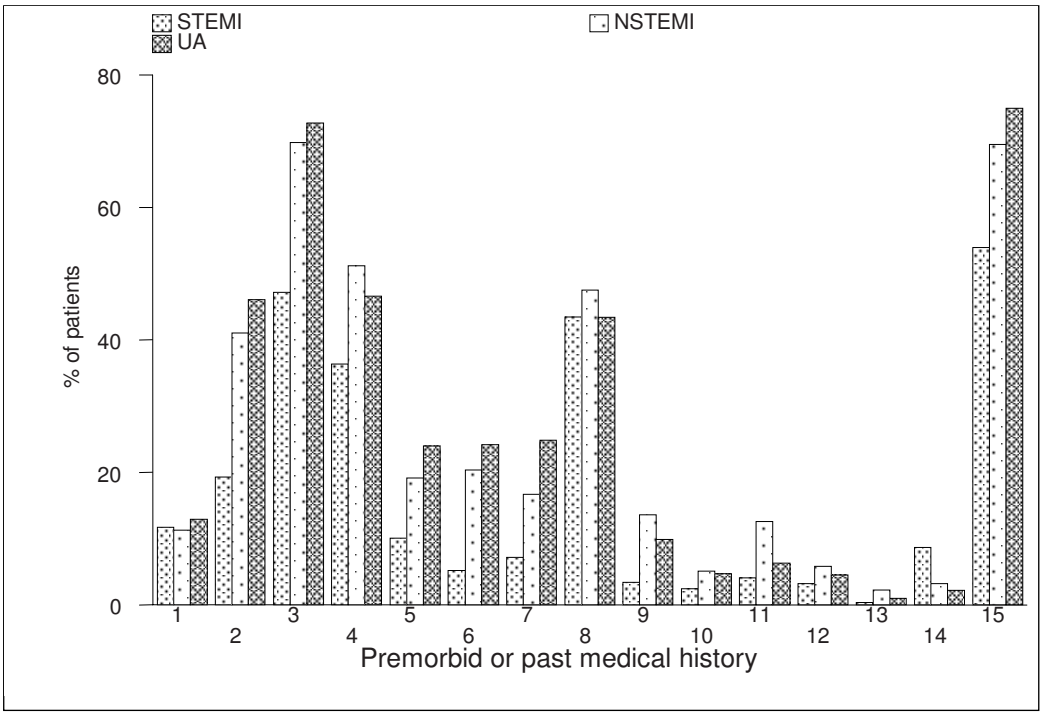


Figure 2.7i Co-morbidities for patients with ACS by ACS stratum, Malaysia 2006



	Pre-morbid or past medical history
1	Family history of premature cardiovascular disease
2	Dyslipidaemia
3	Hypertension
4	Diabetes
5	Myocardial infarction history
6	Documented CAD > 50% stenosis
7	Chronic angina (onset more than 2 weeks ago)
8	New onset angina (less than 2 weeks)
9	Heart failure
10	Chronic lung disease
11	Renal disease
12	Cerebrovascular disease
13	Peripheral vascular disease
14	None of the above
15	Coronary artery disease

Table 2.7.1 Age-gender distribution of patients with ACS by ACS stratum, Malaysia 2006

Gender	Age group	ACS stratum					
		STEMI		NSTEMI		UA	
		No.	%	No.	%	No.	%
Male	20 - <30	21	2	1	0	0	0
	30 - <40	87	7	23	3	21	4
	40 - <50	321	26	122	16	98	18
	50 - <60	414	34	274	35	200	36
	60 - <70	256	21	218	28	142	25
	70 - <80	113	9	112	14	81	14
	≥80	18	1	29	4	18	3
	Total	**1230**	**100**	**779**	**100**	**560**	**100**
Female	20 - <30	1	0	0	0	0	0
	30 - <40	4	2	4	1	4	1
	40 - <50	22	10	17	5	41	14
	50 - <60	46	21	56	16	64	22
	60 - <70	62	29	116	33	87	31
	70 - <80	67	31	132	37	66	23
	≥80	13	6	28	8	23	8
	Total	**215**	**100**	**353**	**100**	**285**	**100**

Note: Percentage is to the nearest decimal point.

Figure 2.7.1a Age-gender distribution for male patients with ACS by ACS stratum, Malaysia 2006

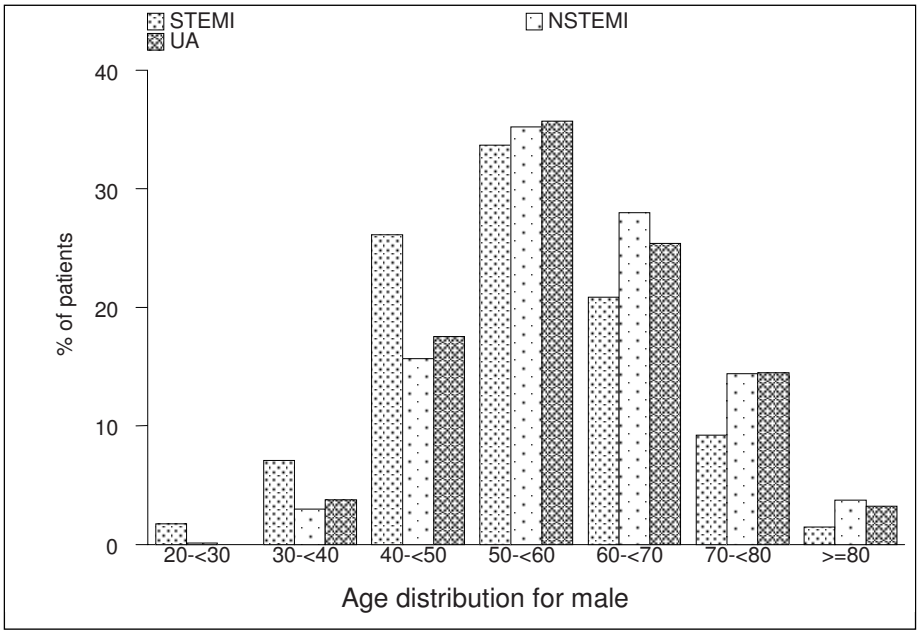


Figure 2.7.1b Age-gender distribution for female patients with ACS by ACS stratum, Malaysia 2006