MOH/S/CRC/11.10 (AR)

Annual Report of the NCVD-ACS Registry 2009 & 2010

Editors:
Wan Azman Wan Ahmad
Sim Kui-Hian

CRC
MINISTRY OF HEALTH MALAYSIA
Research that matters to patients

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NATIONAL CARDIOVASCULAR DISEASE DATABASE (NCVD)

Annual Report of the Acute Coronary Syndrome (ACS) Registry

2009 & 2010

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We would especially like to thank the following:

- Ministry of Health Malaysia
- National Heart Association of Malaysia (NHAM)
- Clinical Research Centre (CRC), Malaysia
- The members of various expert panels
- Our source data providers

PREFACE

NCVD-ACS Registry is the first registry of the National Cardiovascular Database (NCVD), established in 2006. The 2009-2010 NCVD-ACS Registry report is the 3rd report.

This report not only provides information on the ACS management in major hospital providing acute cardiac care services throughout Malaysia, but also provides information on the various trends in ACS. All these information are crucial fact rather than the usual guestimate for the practicing cardiac care staff (physicians, cardiologists, nurses), the hospital administrators be it private or public, the policy makers, the patients advocates, the pharmaceutical and insurance industries not just for academic interest but also for the improvement in the quality of care, for better delivery of service and planning.

There are enormous data collected and this is not possible without the countless hours of medical and nursing staff uploading the information online from individual sites throughout Malaysia. Thanks you very much for your effort, commitment, perseverance and enthusiasm for the last 9 years; it has been truly beyond the call of duty. Our sincere gratitude to the writing committee headed by Prof Dr Wan Azman Wan Ahmad, spending many weekends, pouring through the data, analyzing the figures and making the data into meaningful information. Thank you as your efforts and commitment exemplifies truly a passion for the cause. Our sincere thank you also to the NCVD secretariat staff in the Heart House for quietly working behind the scene, consistently following through and coordinating with the site investigators, the site coordinators, the writing committee, the statisticians, etc; without all of you, the registry and report would not have come together.

We strongly encourage everyone involved in the registry to fully utilize the enormous and rich data in the registry and to publish in medical journals so that the information can be shared worldwide. We have shown that Malaysia is truly able and can contribute to the practice of cardiology to the world.

Lastly, we would like to thanks the National Heart Association of Malaysia, Clinical Research Centre (CRC) and Health Informatics Centre, Ministry of Health Malaysia and the medical industries for the unrestricted grant to make this costly registry a reality.

Thank you.

Prof Dr Sim Kui-Hian
Chairman
NCVD Governance Board

Tan Sri Dato' Seri Dr Robaayah Zambahari
Co-chairman
NCVD Governance Board

FOREWORD

This report will present findings from data collected in the year 2009 and 2010, and we compared these with the findings from previous years. Over this period, the number of hospitals involved in the registry has increased and we now have 16 hospitals. However there is still no involvement yet from the private hospitals. The continuing challenge appears to be to sustain the number of data entries from each participating hospital. In some centers, the numbers have increased, whilst in others it has actually decreased. Part of the reason is due to lack of manpower in participating centers to key-in data. The number of follow-up is also decreasing.

It cannot be overstated that such a database is very important for any nation particularly that pertaining to coronary artery disease. As it is, the picture beginning to emerge appears rather alarming. Apart from the fact that is still the number one killer in our country, it appears to affect an even younger proportion of our population. More worrying is that the number of women having this disease is also on the rise. However, it may be just a presumption. Therefore, it is hoped that this registry will give us a better idea of the groups most at risk and also the pattern of disease. This will enable us to plan the necessary steps to mitigate its impact on our society. The National Heart Association of Malaysia (NHAM) is fully aware of this registry's importance and continues to fund the ACS registry.

The WHO and United Nations has already recognized this problem and has undertaken several initiatives for various countries to adopt in combating this disease. However, the cornerstone of any strategy is still data. For coronary artery disease, this (ACS registry) together with the PCI registry forms the backbone of our information.

Last year, we have improved on the data entry forms and have appointed study coordinators in various centres. We hope that this will improve the quality and amount of information submitted to the database. However commitment and participation are the two main ingredients of a successful registry.

On behalf of the NCVD-ACS committee, we are grateful to many people in making this registry a reality. Not least the Ministry of Health, the participating centers, the doctors, nurses and paramedics involved in data collection, entry and the writing committees for their tireless efforts. It is hoped that in future, more centres, and the number of individuals involved in this project including the writing committee members, will come forward. Our ambition is to one day submit our registry and be accepted in a peer reviewed journal.

We congratulate everyone involved for their excellent work and hope that we can continue to do this over the coming years.

Thank you.

Datuk Prof Dr Azhari Rosman
Chairman
NCVD-ACS Registry
President
National Heart Association of Malaysia

Datuk Dr Jeyaindran Tan Sri Sinnadurai
Co-Chairman
NCVD-ACS Registry

NOTE FROM THE WRITING COMMITTEE CHAIRMAN

Encouraged by the publication of the first NCVD-ACS annual report in 2006 and subsequently annual report of the NCVD-ACS registry 2007-2008 which unraveled a lot of new information, the writing committee continued its effort to come up with the report for year 2009 and 2010. Since the registry was started in 2006 and 2010, during this 5 year period, 16,872 patients with acute coronary syndrome (ACS) were admitted to 17 tertiary hospitals in Malaysia

From 2006 to 2008, data of 9,871 patients that were registered in our database were reported. In 2009 and 2010 another 3594 and 3401 of patients data were reported respectively. This establishes us as the biggest database for ACS in Malaysia; another milestone in the history of cardiovascular disease research in Malaysia. While going through the registry's data, we discovered more convincing results as the data from 2009 and 2010 strengthened most of the findings reported in the earlier annual report.

The report provides information of our current medical practices and compares our situation with that of other published registries. There are still a lot of rooms for improvement in terms of management and outcome. Particularly, we have to plan a strategy to improve symptom to needle time for thrombolytic therapy and symptom to balloon time for primary PCI. In addition, more facilities and resources should be made available so that patients can be treated according to guideline.

The data generated from this registry has provided numerous opportunities for publication. Among the publications include:

- Acute Coronary Syndrome (ACS) Registry - Leading the Charge for National Cardiovascular Disease (NCVD) Database (Medical Journal of Malaysia, 2008)
- Malaysian National Cardiovascular Disease Database (NCVD) – Acute Coronary Syndrome (ACS) Registry: How are we different? (CVD Prevention and Control, 2011)
- Acute Coronary Syndrome in women of reproductive age (International Journal of Women's Health, 2011)
- An Asian Validation of the TIMI risk score for ST-Segment Elevation Myocardial Infarction: Results and Implications for Cardiac Care in a Developing Country (PLOS One, 2012)
- Impact of Cardiac Care Variation on ST-Elevation Myocardial Infarction Outcomes in Malaysia (The American Journal of Cardiology, 2013)

Allow me to take this opportunity to humbly welcome the new centres that have registered to participate in this registry. I would also like to acknowledge all the members of the writing committee for sacrificing their precious Saturdays and being away from their loved ones to make this report possible.

We would like to express our deepest heartfelt gratitude to the many who were involved in making the registry go live. These efforts and contributions would definitely bring a great impact on the future management of cardiovascular disease in this nation.

We highly appreciate any comments and contribution from all NHAM members, friends and colleagues, policymakers, industry personnel and other healthcare providers for the betterment of this registry and report publication in the future.

Thank you.

Prof Dr Wan Azman Wan Ahmad
Chairman
NCVD Writing Committee

ABBREVIATIONS

ACE	Angiotensin Converting Enzyme
ACS	Acute Coronary Syndrome
BMI	Body Mass Index
CABG	Coronary Artery Bypass Graft
CAD	Coronary Artery Disease
CCU	Coronary Care Unit
CK	Creatinine Kinase
CK-MB	Creatinine Kinase, MB Isoenzyme
CRC	Clinical Research Centre
CRF	Case Report Form
CVD	Cardiovascular Disease
DBMS	Database Management System
EDC	Electronic Data Capture
GP	Glycoprotein
HDL	High Density Lipoprotein
HDU	High Dependency Unit
HIC	Health Informatics Centre
ICT	Information and Communication Technology
ICU	Intensive Care Unit
IJN	Institut Jantung Negara
IT/IS	Information Technology and Information System
JPN	Jabatan Pendaftaran Negara
LDL	Low Density Lipoprotein
LVEF	Left Ventricular Ejection Fraction
MOH	Ministry of Health
NCVD	National Cardiovascular Disease Database
NHAM	National Heart Association of Malaysia
NSTEMI	Non ST- Elevation Myocardial Infarction
PMP	Per Million Population
RCC	Registry Coordinating Centre
SAP	Statistical Analysis Plan
SD	Standard Deviation
SDP	Source Data Provider
STEMI	ST– Elevation Myocardial Infarction
TIMI	Thrombolysis In Myocardial Infarction
TnI	Troponin I
TnT	Troponin T
UA	Unstable Angina

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CONTENTS

LIST OF TABLES

CHAPTER 1 :
PROVISION OF CORONARY CARE SERVICE IN MALAYSIA

Omar Ismail [1] ● Chin Sze Piaw [2] ● Sim Kui Hian [3] ● Wan Azman Wan Ahmad [4] ●

1 Hospital Pulau Pinang
2 Mawar Renal Medical Centre
3 National Heart Association of Malaysia
4 Pusat Perubatan Universiti Malaya

CHAPTER 1: PROVISION OF CORONARY CARE SERVICES IN MALAYSIA

Omar Ismail[1], Chin Sze Piaw[2], Sim Kui Hian[3] and Wan Azman Wan Ahmad[4]
1 Hospital Pulau Pinang, 2 Mawar Renal Medical Centre, 3 National Heart Association of Malaysia, 4 Pusat Perubatan Universiti Malaya

Summary

1. There was an uneven distribution of cardiologist and cardiac services reported by state and sector.
2. The number of cardiologists per population ratio was far below that for other developed countries.
3. Kuala Lumpur has five times the national average cardiologist to population ratio.
4. There were considerably more cardiologists and catheterization laboratories in the private sector compared to the public sector.

We had reported previously in 2006 on the number of coronary care units (CCU) in the country. In this report, we highlighted the number and density of cardiologists and catheterization laboratories (cath labs) in Malaysia and by individual states as of December 2012. The information was sourced from the registry of the National Specialist Register (NSR) and the Radiation Health and Safety, Engineering Services division of the Ministry of Health Malaysia.

The National Heart Association of Malaysia (NHAM) is under the umbrella of the Cardiology Chapter of the Academy of Medicine of Malaysia. It is affiliated with the European Society of Cardiology (ESC) and American College of Cardiology (ACC). Every year, the NHAM credentialing committee recognizes and certifies qualified cardiologists in Malaysia. The cardiologists are conferred Fellows of the NHAM and also recommended for registration as cardiologists in the National Specialist Register (NSR).

Number and density of Cardiologists in Malaysia

There are currently one hundred and eighty-six cardiologists registered in the NSR in Malaysia with estimated population of nearly thirty million (exact census figures 29,336,800)[1]. This represents just six cardiologists for every one million Malaysian, or 0.06 per 10,000 population. As a comparison, in 2009 there were estimated to be 55.7 cardiologists per million population in the United States of America (USA) or 0.6 per 10,000 population[2]. This ratio in the USA was regarded as adequate for a developed country.

Thirty two cardiologists or seventeen percent (17%) are serving in the public sector under the Ministry of Health (MOH) hospitals and public universities. There are no cardiologists in the public sector for the states of Perlis, Negeri Sembilan and Melaka.

Wilayah Persekutuan Kuala Lumpur (WP KL) has the highest density of cardiologists to population with fifty five cardiologists serving 1.7 million population, making up to 0.32 per 10,000 population. This was followed by the state of Pulau Pinang with 0.19 per 10,000 population, and thirdly Melaka with 0.09 per 10,000 population.

At the other end of the scale the states of Kelantan, Terengganu and Sabah (with Labuan) have the lowest cardiologist ratio with 0.02 per 10,000 population. There are no cardiologists in the state of Perlis at the time of publication.

Selangor and Putrajaya with the highest population of 5.7 million residents are served by 32 cardiologists, making up 0.06 per 10,000 population.

Number and density of catheterization laboratories in Malaysia

There are currently fifty-five cardiac catheterization facilities (cath labs) in Malaysia. This represents just two cath labs for every one million Malaysian, or 0.02 per 10,000 population.

There are thirteen (13) cath labs or twenty four percent (24%) in the public sector. There are no cath labs in the public sector for the states of Negeri Sembilan, Melaka and Perlis, and no cath labs in the private sector for Terengganu and Sabah.

WP KL has the highest density ratio of cath lab to population, with 10 cath labs or 0.06 per 10,000 population. Again this was followed by Pulau Pinang with 0.05 per 10,000 population and Melaka with 0.04 per 10,000 population.

The east coast states of Pahang, Terengganu and Kelantan all have a ratio of 0.01 per 10,000 population while Sabah currently have just one cath lab to serve a population of nearly 3.5 million or density of 0.003 per 10,000 population. The state of Perlis which has the lowest population number has no cath lab at the time of publication.

Selangor and Putrajaya has the most number of cath labs, but also has the highest population, therefore giving a ratio of 0.02 per 10,000 population.

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Table 1.1 Number and Density of Cardiologist in Malaysia by State and Sector, 2012

State	Sector	Number	Population in Malaysia (2012)*	Per 10,000 population
Malaysia	Public	32		
Malaysia	Private	154		
Malaysia	**Total**	**186**	**29,336,800**	**0.06**
Perlis	Public	-		
Perlis	Private	-		
Perlis	**Total**	**0**	**239,400**	**0**
Kedah	Public	2		
Kedah	Private	5		
Kedah	**Total**	**7**	**1,996,800**	**0.04**
Pulau Pinang	Public	4		
Pulau Pinang	Private	26		
Pulau Pinang	**Total**	**30**	**1,611,100**	**0.19**
Perak	Public	-		
Perak	Private	12		
Perak	**Total**	**12**	**2,416,700**	**0.05**
Selangor & WP Putrajaya	Public	7		
Selangor & WP Putrajaya	Private	25		
Selangor & WP Putrajaya	**Total**	**32**	**5,730,200**	**0.06**
WP Kuala Lumpur	Public	6		
WP Kuala Lumpur	Private	49		
WP Kuala Lumpur	**Total**	**55**	**1,713,400**	**0.32**
Negeri Sembilan	Public	-		
Negeri Sembilan	Private	3		
Negeri Sembilan	**Total**	**3**	**1,056,300**	**0.03**
Melaka	Public	-		
Melaka	Private	8		
Melaka	**Total**	**8**	**842,500**	**0.09**
Johor	Public	2		
Johor	Private	7		
Johor	**Total**	**9**	**3,439,600**	**0.03**
Pahang	Public	3		
Pahang	Private	2		
Pahang	**Total**	**5**	**1,548,400**	**0.03**
Kelantan	Public	-		
Kelantan	Private	3		
Kelantan	**Total**	**3**	**1,640,400**	**0.02**
Terengganu	Public	1		
Terengganu	Private	1		
Terengganu	**Total**	**2**	**1,092,900**	**0.02**
Sabah & WP Labuan	Public	2		
Sabah & WP Labuan	Private	4		
Sabah & WP Labuan	**Total**	**6**	**3,463,300**	**0.02**
Sarawak	Public	5		
Sarawak	Private	9		
Sarawak	**Total**	**14**	**2,545,800**	**0.05**

** Indicator Demographics Malaysia 2012*

Table 1.2 Number and Density of Hospital with Catheterization Laboratory in Malaysia by State and Sector, 2012

State	Sector	Number[+]	Population in Malaysia (2012)*	Per 10,000 population
Malaysia	Public	13		
Malaysia	Private	42		
Malaysia	**Total**	**55**	**29,336,800**	**0.02**
Perlis	Public	-		
Perlis	Private	-		
Perlis	**Total**	**0**	**239,400**	**0**
Kedah	Public	1		
Kedah	Private	3		
Kedah	**Total**	**4**	**1,996,800**	**0.02**
Pulau Pinang	Public	1		
Pulau Pinang	Private	7		
Pulau Pinang	**Total**	**8**	**1,611,100**	**0.05**
Perak	Public	1		
Perak	Private	3		
Perak	**Total**	**4**	**2,416,700**	**0.02**
Selangor & WP Putrajaya	Public	2		
Selangor & WP Putrajaya	Private	9		
Selangor & WP Putrajaya	**Total**	**11**	**5,730,200**	**0.02**
WP Kuala Lumpur	Public	2		
WP Kuala Lumpur	Private	8		
WP Kuala Lumpur	**Total**	**10**	**1,713,400**	**0.06**
Negeri Sembilan	Public	-		
Negeri Sembilan	Private	2		
Negeri Sembilan	**Total**	**2**	**1,056,300**	**0.02**
Melaka	Public	-		
Melaka	Private	3		
Melaka	**Total**	**3**	**842,500**	**0.04**
Johor	Public	1		
Johor	Private	2		
Johor	**Total**	**3**	**3,439,600**	**0.01**
Pahang	Public	1		
Pahang	Private	1		
Pahang	**Total**	**2**	**1,548,400**	**0.01**
Kelantan	Public	1		
Kelantan	Private	1		
Kelantan	**Total**	**2**	**1,640,400**	**0.01**
Terengganu	Public	1		
Terengganu	Private	-		
Terengganu	**Total**	**1**	**1,092,900**	**0.01**
Sabah & WP Labuan	Public	1		
Sabah & WP Labuan	Private	-		
Sabah & WP Labuan	**Total**	**1**	**3,463,300**	**0**
Sarawak	Public	1		
Sarawak	Private	3		
Sarawak	**Total**	**4**	**2,545,800**	**0.02**

[+] *Radiation Health and Safety, Engineering Services division of the Ministry of Health Malaysia.*

* *Indicator Demographics Malaysia 2012*

CHAPTER 2 :
PATIENT CHARACTERISTICS

Alan Fong Yean Yip, Ong Tiong Kiam, Sim Kui Hian

Pusat Jantung Hospital Umum Sarawak

CHAPTER 2: PATIENT CHARACTERISTICS

Alan Fong Yean Yip, Ong Tiong Kiam, Sim Kui Hian
Pusat Jantung Hospital Umum Sarawak

Summary

1. The STEMI subgroup of ACS appears to be on the rise, with a corresponding drop in NSTEMI.
2. ACS patients are younger than non-Asian counterparts in the GRACE Registry, in particular among the STEMI subgroup.
3. The prevalence of coronary risk factors amongst patients presenting with ACS was similar between the years.

This chapter details the patient characteristics of patients admitted with acute coronary syndrome (ACS) between 2006 and 2010. During this five year period, 16,872 patients were admitted to 17 tertiary hospitals in Malaysia.

Patient demographics

We noted that amongst Malaysian patients with ACS, the mean age was 59 years (SD 12), with 24% under the age of 50 years. We noted 76% of patients were male. Amongst males, 28% were under the age of 50 years, while amongst females, 12% were under the age of 50 years. [Table 2.1]

The patients were distributed amongst these three major ethnic groups: 49% Malay, 22% Chinese and 23% Indian. We noted that 29% amongst the Malays, 19% amongst the Chinese, 31% amongst the Indians, were male patients under the age of 50 years. We also noted that 12% amongst the Malays, 4% amongst the Chinese, 15% amongst the Indians, were female patients under the age of 50 years. [Table 2.1]

Coronary risk factors

Of patients with ACS, we noted 33% were active smokers, 22% were former smokers, while 39% never smoked. We noted that 33% were previously diagnosed with dyslipidaemia, 61% with hypertension, 43% with diabetes and 11% had a family history of premature coronary artery disease. [Table 2.1]

We noted 19% had a prior myocardial infarction; 17% had documented coronary artery disease > 50% stenosis; 11% had chronic stable angina, while 55% had new onset angina; 7% had a prior history of heart failure, 7% had prior renal disease; 4% had prior cerebrovascular disease and 1% peripheral vascular disease. We noted 75% of patients had an elevated BMI of >23 kg/m^2. Of these patients, 95% had at least one coronary risk factor when admitted with an ACS event. [Table 2.1]

ACS stratum: STEMI, NSTEMI and unstable angina

Between 2006 and 2010, 48% of patients presented with STEMI, 29% with NSTEMI and 22% with unstable angina. [Table 2.7]

The mean age of presentation for the different ACS presentations were as follows: 56 years (SD 12) for STEMI; 62 years (SD 12) for NSTEMI and 61 years (SD 12) for unstable angina. About 31% of STEMI presentations, 15% of NSTEMI and 18% of unstable angina were aged less than 50 years at presentation with ACS. Male patients accounted for 85% of STEMI, 70% for NSTEMI and 65% for unstable angina. Malay patients accounted for 55% of STEMI, 46% for NSTEMI and 42% for unstable angina. [Table 2.7]

Current smokers made up 47% of patients with STEMI, 23% with NSTEMI and 16% with unstable angina. For a known history of dyslipidaemia, 25% were found to have this in the STEMI group, 29% in the NSTEMI, and

44% in the unstable angina groups. For a known history of hypertension, the prevalence was 49% in the STEMI; 71% in the NSTEMI and 75% in the unstable angina groups. For diabetes, the prevalence was 37% in the STEMI, 50% in the NSTEMI and 48% in the unstable angina groups. [Table 2.1]

Discussion

Compared with the large, multicenter GRACE Registry[1] and other Western registries, patients in Malaysia were younger (mean age in GRACE for STEMI: 65 years; NSTEMI: 68 years; unstable angina 66 years) and had more males (prevalence of males in GRACE for STEMI: 70%; NSTEMI: 66%; unstable angina: 64%). Malaysian patients with ACS had more risk factors than patients in the GRACE Registry (GRACE hypertension prevalence were 52% for STEMI, 62% for NSTEMI and 66% for unstable angina; GRACE dyslipidaemia prevalence was 38% in STEMI, 47% for NSTEMI and 54% for unstable angina; GRACE diabetes prevalence was 21% for STEMI, 28% for NSTEMI and 26% for unstable angina). However, for GRACE, prevalence of smoking was found to be higher compared to the Malaysian data: 62% for STEMI; 57% of NSTEMI and 55% for unstable angina. [Table 2.7]

A recent publication in the Southeast Asian region encompassing a similarly diverse ethic distribution demonstrated a similar pattern to ours: that these patients were younger and had relatively more of the male gender.[2]

The reasons for the above could be attributed to the fast rising prevalence of established coronary risk factors, such as hypertension, dyslipidaemia and diabetes.[3,4] In addition, other coronary risk factors such as psychosocial stress and change in dietary habits due to rural to urban environments could play a substantial contributory role to these phenomena.

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Table 2.1 Summary of characteristics for patients with ACS, NCVD-ACS Registry, 2006-2010

Year	2006-2008	2009	2010	2006-2010
Total	**9871**	**3594**	**3401**	**16866**
DEMOGRAPHICS				
Age, years				
N	9871	3594	3401	16866
Mean (SD)	59 (12)	59 (12)	59 (12)	59 (12)
Median (min, max)	59 (21, 100)	59 (22, 97)	58 (20, 97)	59 (20, 100)
IQR	17	18	17	17
Age group, No. (%)				
20 - <30	61 (1)	21 (1)	27 (1)	109 (1)
30 - <40	455 (5)	182 (5)	185 (5)	822 (5)
40 - <50	1783 (18)	628 (17)	603 (18)	3014 (18)
50 - <60	3010 (30)	1079 (30)	1088 (32)	5177 (31)
60 - <70	2594 (26)	933 (26)	811 (24)	4338 (26)
70 - <80	1628 (16)	596 (17)	540 (16)	2764 (16)
≥ 80	340 (3)	155 (4)	147 (4)	642 (4)
Gender, No. (%)				
Male	7476 (76)	2726 (76)	2621 (77)	12823 (76)
Female	2395 (24)	868 (24)	780 (23)	4043 (24)
Ethnic group, No. (%)				
Malay	4819 (49)	1787 (50)	1712 (50)	8318 (49)
Chinese	2295 (23)	764 (21)	697 (20)	3756 (22)
Indian	2241 (23)	866 (24)	780 (23)	3887 (23)
Orang Asli	2 (0)	1 (0)	4 (0)	7 (0)
Kadazan	36 (0)	22 (1)	35 (1)	93 (1)
Melanau	2 (0)	2 (0)	3 (0)	7 (0)
Murut	0 (0)	1 (0)	1 (0)	2 (0)
Bajau	53 (1)	15 (0)	36 (1)	104 (1)
Bidayuh	52 (1)	9 (0)	6 (0)	67 (0)
Iban	120 (1)	35 (1)	19 (1)	174 (1)
Sikh	22 (0)	13 (0)	10 (0)	45 (0)
Other Malaysian	100 (1)	30 (1)	46 (1)	176 (1)
Foreigner	129 (1)	49 (1)	52 (2)	230 (1)
OTHER CORONARY RISK FACTORS				
Smoking, No. (%)				
Never	3726 (38)	1477 (41)	1317 (39)	6520 (39)
Former (quit >30 days)	2165 (22)	916 (25)	702 (21)	3783 (22)
Current (any tobacco use within last 30 days)	3344 (34)	1102 (31)	1159 (34)	5605 (33)
Unknown	636 (6)	99 (3)	223 (7)	958 (6)

Year	2006-2008	2009	2010	2006-2010
Total	**9871**	**3594**	**3401**	**16866**
Family history of Premature CVD, No. (%)				
Yes	1135 (11)	337 (9)	430 (13)	1902 (11)
No	5557 (56)	2207 (61)	1947 (57)	9711 (58)
Unknown	3179 (32)	1050 (29)	1024 (30)	5253 (31)
Body Mass Index (BMI), kg/m^2				
N	5440	1850	1360	8650
Mean (SD)	25.6 (4.3)	25.8 (4.4)	26.0 (4.6)	25.7 (4.4)
Median (min, max)	25.1 (13.2, 60.4)	25.3 (14.5, 65.3)	25.5 (14.2, 64.5)	25.2 (13.2, 65.3)
IQR	4.9	4.7	5.3	4.9
BMI, kg/ m^2, No. (%)				
<18.5	147 (3)	38 (2)	32 (2)	217 (3)
18.5 - 23.0	1261 (23)	403 (22)	302 (22)	1966 (23)
>23.0	4032 (74)	1409 (76)	1026 (75)	6467 (75)
Waist Hip Ratio (WHR)				
N	4261	1283	753	6297
Mean (SD)	.96 (.08)	.96 (.08)	.96 (.09)	.96 (.08)
Median (min, max)	.96 (.36, 1.85)	.96 (.52, 2.02)	.96 (.36, 1.58)	.96 (.36, 2.02)
IQR	0.07	0.07	0.10	0.07
WHR, No. (%)				
Men	3360	1045	648	5053
≤1.0	2586 (77)	789 (76)	471 (73)	3846 (76)
>1.0	774 (23)	256 (24)	177 (27)	1207 (24)
Women	901	238	105	1244
≤0.85	109 (12)	26 (11)	18 (17)	153 (12)
>0.85	792 (88)	212 (89)	87 (83)	1091 (88)
Waist circumference, cm				
N	4525	1335	826	6686
Mean (SD)	88.6 (14.6)	89.2 (14.1)	89 (17.5)	88.7 (14.9)
Median (min, max)	89 (36, 162)	90 (36, 192)	90 (36, 181)	90 (36, 192)
IQR	15	15	15	15
Waist circumference, cm, No. (%)				
Men	3542	1088	710	5340
≤90	1915 (54)	578 (53)	350 (49)	2843 (53)
>90	1627 (46)	510 (47)	360 (51)	2497 (47)

Year	2006-2008	2009	2010	2006-2010
Total	**9871**	**3594**	**3401**	**16866**
Women	983	247	116	1346
≤80	235 (24)	63 (26)	36 (31)	334 (25)
>80	748 (76)	184 (74)	80 (69)	1012 (75)
CO-MORBIDITY				
Dyslipidaemia, No. (%)				
Yes	3279 (33)	1248 (35)	1090 (32)	5617 (33)
No	3078 (31)	1586 (44)	1429 (42)	6093 (36)
Unknown	3514 (36)	760 (21)	882 (26)	5156 (31)
Hypertension, No. (%)				
Yes	5933 (60)	2302 (64)	2081 (61)	10316 (61)
No	2479 (25)	954 (27)	962 (28)	4395 (26)
Unknown	1459 (15)	338 (9)	358 (11)	2155 (13)
Diabetes, No. (%)				
Yes	4173 (42)	1564 (44)	1508 (44)	7245 (43)
No	3945 (40)	1571 (44)	1434 (42)	6950 (41)
Unknown	1753 (18)	459 (13)	459 (13)	2671 (16)
Fasting blood glucose, mmol/L				
N	7143	2735	2337	12215
Mean (SD)	8.0 (3.8)	7.7 (3.4)	8.0 (3.6)	8.0 (3.7)
Median (min, max)	6.7 (3.0, 29.9)	6.6 (3.0, 29.9)	6.8 (3.0, 29.9)	6.7 (3.0, 29.9)
IQR	3.7	3.0	3.4	3.4
Myocardial infarction history, No. (%)				
Yes	1591 (16)	923 (26)	678 (20)	3192 (19)
No	6085 (62)	2095 (58)	2192 (64)	10372 (61)
Unknown	2195 (22)	576 (16)	531 (16)	3302 (20)
Documented CAD>50% stenosis, No. (%)				
Yes	1572 (16)	729 (20)	552 (16)	2853 (17)
No	5519 (56)	1920 (53)	2079 (61)	9518 (56)
Unknown	2780 (28)	945 (26)	770 (23)	4495 (27)
Chronic angina (onset more than 2 weeks ago), No. (%)				
Yes	1140 (12)	430 (12)	342 (10)	1912 (11)
No	6653 (67)	2558 (71)	2551 (75)	11762 (70)
Unknown	2078 (21)	606 (17)	508 (15)	3192 (19)

Year	2006-2008	2009	2010	2006-2010
Total	**9871**	**3594**	**3401**	**16866**
New onset angina (less than 2 weeks ago), No. (%)				
Yes	4820 (49)	2429 (68)	2051 (60)	9300 (55)
No	3391 (34)	912 (25)	976 (29)	5279 (31)
Unknown	1660 (17)	253 (7)	374 (11)	2287 (14)
Heart failure, No. (%)				
Yes	670 (7)	271 (8)	291 (9)	1232 (7)
No	7260 (74)	2943 (82)	2678 (79)	12881 (76)
Unknown	1941 (20)	380 (11)	432 (13)	2753 (16)
Chronic lung disease, No. (%)				
Yes	322 (3)	134 (4)	147 (4)	603 (4)
No	7580 (77)	3050 (85)	2814 (83)	13444 (80)
Unknown	1969 (20)	410 (11)	440 (13)	2819 (17)
Renal disease, No. (%)				
Yes	643 (7)	253 (7)	258 (8)	1154 (7)
No	7255 (73)	2697 (75)	2648 (78)	12600 (75)
Unknown	1973 (20)	644 (18)	495 (15)	3112 (18)
Cerebrovascular disease, No. (%)				
Yes	355 (4)	116 (3)	128 (4)	599 (4)
No	7557 (77)	2817 (78)	2776 (82)	13150 (78)
Unknown	1959 (20)	661 (18)	497 (15)	3117 (18)
Peripheral vascular disease, No. (%)				
Yes	80 (1)	20 (1)	21 (1)	121 (1)
No	7725 (78)	2851 (79)	2834 (83)	13410 (80)
Unknown	2066 (21)	723 (20)	546 (16)	3335 (20)
None of the above, No. (%)				
Yes	235 (2)	70 (2)	77 (2)	382 (2)
No	8700 (88)	3355 (93)	3093 (91)	15148 (90)
Unknown	936 (9)	169 (5)	231 (7)	1336 (8)
Coronary artery disease, No. (%)				
Yes	6345 (64)	2868 (80)	2437 (72)	11650 (69)
No	1839 (19)	415 (12)	555 (16)	2809 (17)
Unknown	1687 (17)	311 (9)	409 (12)	2407 (14)

***** *'Unknown' includes patients who do not know their co-morbidities and missing data*

****** *Coronary artery disease is defined as "Yes" to 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)*

Table 2.2 Distribution of patients with ACS by Source Data Providers, NCVD-ACS Registry, 2006-2010

Year	2006		2007		2008		2009		2010		Total	
Source Data Provider	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
Pusat Perubatan Universiti Malaya	801	24	623	17	339	12	941	26	623	18	3327	20
Hospital Pulau Pinang	464	14	593	16	471	17	395	11	325	10	2248	13
Institut Jantung Negara	456	13	401	11	264	9	478	13	365	11	1964	12
Hospital Kuala Lumpur	412	12	379	10	334	12	230	6	424	12	1779	11
Hospital Tengku Ampuan Afzan	152	4	370	10	278	10	339	9	288	8	1427	8
Hospital Umum Sarawak	362	11	286	8	274	10	222	6	151	4	1295	8
Hospital Sultanah Aminah	242	7	231	6	261	9	303	8	191	6	1228	7
Hospital Tuanku Ja'afar	152	4	246	7	193	7	74	2	128	4	793	5
Hospital Tuanku Fauziah	53	2	71	2	101	4	20	1	60	2	305	2
Hospital Raja Perempuan Zainab II	141	4	134	4	82	3	134	4	70	2	561	3
Hospital Sultanah Bahiyah	157	5	48	1	4	0	97	3	66	2	372	2
Hospital Queen Elizabeth			92	3	82	3	77	2	201	6	452	3
Hospital Raja Permaisuri Bainun			53	1	0	0	93	3	173	5	319	2
Hospital Melaka			113	3	146	5	131	4	186	5	576	3
Hospital Tengku Ampuan Rahimah					10	0	60	2	117	3	187	1
Hospital Serdang									33	1	33	0
TOTAL	**3392**	**100**	**3640**	**100**	**2839**	**100**	**3594**	**100**	**3401**	**100**	**16866**	**100**

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

Table 2.3 Age-gender distribution of patients with ACS, NCVD-ACS Registry, 2006-2010

	Age	Gender					
		Male		Female		Total	
		No.	%	No.	%	No.	%
2006-2008	20 - <30	58	1	3	0	61	1
	30 - <40	416	6	39	2	455	5
	40 - <50	1552	21	231	10	1783	18
	50 - <60	2509	34	501	21	3010	30
	60 - <70	1853	25	741	31	2594	26
	70 - <80	911	12	717	30	1628	16
	>=80	177	2	163	7	340	3
	Total	**7476**	**100**	**2395**	**100**	**9871**	**100**
2009	20 - <30	21	1	0	0	21	1
	30 - <40	170	6	12	1	182	5
	40 - <50	560	21	68	8	628	17
	50 - <60	879	32	200	23	1079	30
	60 - <70	685	25	248	29	933	26
	70 - <80	341	13	255	29	596	17
	>=80	70	3	85	10	155	4
	Total	**2726**	**100**	**868**	**100**	**3594**	**100**
2010	20 - <30	27	1	0	0	27	1
	30 - <40	170	6	15	2	185	5
	40 - <50	546	21	57	7	603	18
	50 - <60	895	34	193	25	1088	32
	60 - <70	602	23	209	27	811	24
	70 - <80	312	12	228	29	540	16
	>=80	69	3	78	10	147	4
	Total	**2621**	**100**	**780**	**100**	**3401**	**100**
2006 - 2010	20 - <30	106	1	3	0	109	1
	30 - <40	756	6	66	2	822	5
	40 - <50	2658	21	356	9	3014	18
	50 - <60	4283	33	894	22	5177	31
	60 - <70	3140	24	1198	30	4338	26
	70 - <80	1564	12	1200	30	2764	16
	>=80	316	2	326	8	642	4
	Total	**12823**	**100**	**4043**	**100**	**16866**	**100**

Note: *Percentage is to the nearest decimal point*

Table 2.4.1 Age-gender distribution of patients with ACS by ethnic group, NCVD-ACS Registry, 2006-2010

Year	Gender	Age group	Ethnic group							
			Malay		Chinese		Indian		Others	
			No.	%	No.	%	No.	%	No.	%
2006 - 2008	Male	20 - <30	29	1	10	1	13	1	6	1
		30 - <40	200	5	63	4	110	7	43	10
		40 - <50	817	22	241	14	389	24	105	25
		50 - <60	1297	34	495	30	587	37	130	31
		60 - <70	950	25	503	30	310	19	90	21
		70 - <80	430	11	293	18	147	9	41	10
		>=80	71	2	58	3	41	3	7	2
		Total	**3794**	**100**	**1663**	**100**	**1597**	**100**	**422**	**100**
	Female	20 - <30	2	0	0	0	1	0	0	0
		30 - <40	13	1	10	2	13	2	3	3
		40 - <50	112	11	20	3	92	14	7	7
		50 - <60	233	23	89	14	160	25	19	20
		60 - <70	332	32	192	30	188	29	29	31
		70 - <80	287	28	244	39	155	24	31	33
		>=80	46	4	77	12	35	5	5	5
		Total	**1025**	**100**	**632**	**100**	**644**	**100**	**94**	**100**
2009	Male	20 - <30	10	1	1	0	7	1	3	2
		30 - <40	85	6	21	4	44	7	20	14
		40 - <50	309	22	78	14	142	22	31	22
		50 - <60	483	35	136	25	232	36	28	20
		60 - <70	344	25	168	30	140	22	33	24
		70 - <80	141	10	123	22	61	10	16	11
		>=80	24	2	25	5	12	2	9	6
		Total	**1396**	**100**	**552**	**100**	**638**	**100**	**140**	**100**
	Female	20 - <30	0	0	0	0	0	0	0	0
		30 - <40	7	2	0	0	3	1	2	5
		40 - <50	30	8	5	2	31	14	2	5
		50 - <60	106	27	30	14	54	24	10	27
		60 - <70	127	32	50	24	60	26	11	30
		70 - <80	101	26	84	40	59	26	11	30
		>=80	20	5	43	20	21	9	1	3
		Total	**391**	**100**	**212**	**100**	**228**	**100**	**37**	**100**

Year	Gender	Age group	Ethnic group							
			Malay		Chinese		Indian		Others	
			No.	%	No.	%	No.	%	No.	%
2010	Male	20 - <30	14	1	1	0	4	1	8	5
		30 - <40	89	6	18	3	38	7	25	15
		40 - <50	301	22	93	18	115	21	36	22
		50 - <60	480	35	159	31	204	37	53	32
		60 - <70	313	23	140	27	123	22	26	16
		70 - <80	155	11	89	17	54	10	14	8
		>=80	30	2	21	4	13	2	5	3
		Total	1382	100	521	100	551	100	167	100
	Female	20 - <30	0	0	0	0	0	0	0	0
		30 - <40	8	2	1	1	2	1	4	9
		40 - <50	32	10	5	3	14	6	6	13
		50 - <60	81	25	26	15	77	34	9	20
		60 - <70	91	28	46	26	61	27	11	24
		70 - <80	97	29	62	35	55	24	14	31
		>=80	21	6	36	20	20	9	1	2
		Total	330	100	176	100	229	100	45	100
2006 - 2010	Male	20 - <30	53	1	12	0	24	1	17	2
		30 - <40	374	6	102	4	192	7	88	12
		40 - <50	1429	22	412	15	646	23	173	24
		50 - <60	2259	34	790	29	1023	37	211	29
		60 - <70	1607	24	811	30	573	21	149	20
		70 - <80	725	11	505	18	262	9	70	10
		>=80	125	2	104	4	66	2	21	3
		Total	**6572**	**100**	**2736**	**100**	**2786**	**100**	**729**	**100**
	Female	20 - <30	2	0	0	0	1	0	0	0
		30 - <40	28	2	11	1	18	2	9	5
		40 - <50	174	10	30	3	137	12	15	9
		50 - <60	420	24	145	14	291	26	38	22
		60 - <70	550	32	288	28	309	28	51	29
		70 - <80	485	28	390	38	269	24	56	32
		>=80	87	5	156	15	76	7	7	4
		Total	**1746**	**100**	**1020**	**100**	**1101**	**100**	**176**	**100**

***'Others' includes Orang asli, Kadazan, Melanau, Murut, Bajau, Bidayuh, Iban, other Malaysian and Foreigner*
***Note:** Percentage is to the nearest decimal point*

Table 2.4.2 Age-gender distribution of patients with ACS by pre-morbid diabetes, NCVD-ACS Registry, 2006-2010

Year	Gender	Age group	Pre-morbid diabetes					
			Diabetic		Non-diabetic		Unknown	
			No.	%	No.	%	No.	%
2006-2008	Male	20 - <30	7	0	31	1	20	1
		30 - <40	96	3	211	7	109	8
		40 - <50	500	18	712	22	340	24
		50 - <60	1031	37	1005	31	473	33
		60 - <70	779	28	772	24	302	21
		70 - <80	360	13	403	13	148	10
		>=80	47	2	86	3	44	3
		Total	**2820**	**100**	**3220**	**100**	**1436**	**100**
	Female	20 - <30	1	0	1	0	1	0
		30 - <40	14	1	19	3	6	2
		40 - <50	137	10	65	9	29	9
		50 - <60	303	22	138	19	60	19
		60 - <70	439	32	210	29	92	29
		70 - <80	394	29	229	32	94	30
		>=80	65	5	63	9	35	11
		Total	**1353**	**100**	**725**	**100**	**317**	**100**
2009	Male	20 - <30	2	0	17	1	2	1
		30 - <40	41	4	94	7	35	9
		40 - <50	188	17	284	22	88	23
		50 - <60	382	35	388	31	109	29
		60 - <70	308	28	294	23	83	22
		70 - <80	136	13	156	12	49	13
		>=80	26	2	34	3	10	3
		Total	**1083**	**100**	**1267**	**100**	**376**	**100**
	Female	20 - <30	0	0	0	0	0	0
		30 - <40	5	1	6	2	1	1
		40 - <50	34	7	23	8	11	13
		50 - <60	144	30	42	14	14	17
		60 - <70	146	30	79	26	23	28
		70 - <80	117	24	114	38	24	29
		>=80	35	7	40	13	10	12
		Total	**481**	**100**	**304**	**100**	**83**	**100**

Year	Gender	Age group	Pre-morbid diabetes					
			Diabetic		Non-diabetic		Unknown	
			No.	%	No.	%	No.	%
2010	Male	20 - <30	1	0	21	2	5	1
		30 - <40	42	4	94	8	34	9
		40 - <50	198	18	243	21	105	27
		50 - <60	395	36	377	33	123	32
		60 - <70	276	25	257	22	69	18
		70 - <80	145	13	128	11	39	10
		>=80	32	3	27	2	10	3
		Total	**1089**	**100**	**1147**	**100**	**385**	**100**
	Female	20 - <30	0	0	0	0	0	0
		30 - <40	7	2	7	2	1	1
		40 - <50	26	6	24	8	7	9
		50 - <60	120	29	57	20	16	22
		60 - <70	131	31	65	23	13	18
		70 - <80	101	24	102	36	25	34
		>=80	34	8	32	11	12	16
		Total	**419**	**100**	**287**	**100**	**74**	**100**
2006-2010	Male	20 - <30	10	0	69	1	27	1
		30 - <40	179	4	399	7	178	8
		40 - <50	886	18	1239	22	533	24
		50 - <60	1808	36	1770	31	705	32
		60 - <70	1363	27	1323	23	454	21
		70 - <80	641	13	687	12	236	11
		>=80	105	2	147	3	64	3
		Total	**4992**	**100**	**5634**	**100**	**2197**	**100**
	Female	20 - <30	1	0	1	0	1	0
		30 - <40	26	1	32	2	8	2
		40 - <50	197	9	112	9	47	10
		50 - <60	567	25	237	18	90	19
		60 - <70	716	32	354	27	128	27
		70 - <80	612	27	445	34	143	30
		>=80	134	6	135	10	57	12
		Total	**2253**	**100**	**1316**	**100**	**474**	**100**

Note: *Percentage is to the nearest decimal point*

Table 2.4.3 Age-gender distribution of patients with ACS by pre-morbid hypertension, NCVD-ACS Registry, 2006-2010

Year	Gender	Age group	Pre-morbid hypertension					
			Hypertensive		Non-Hypertensive		Unknown	
			No.	%	No.	%	No.	%
2006-2008	Male	20 - <30	13	0	27	1	18	1
		30 - <40	135	3	180	8	101	8
		40 - <50	651	16	587	27	314	26
		50 - <60	1410	34	701	32	398	33
		60 - <70	1183	29	428	20	242	20
		70 - <80	601	15	196	9	114	9
		>=80	99	2	43	2	35	3
		Total	**4092**	**100**	**2162**	**100**	**1222**	**100**
	Female	20 - <30	1	0	1	0	1	0
		30 - <40	15	1	17	5	7	3
		40 - <50	153	8	47	15	31	13
		50 - <60	379	21	79	25	43	18
		60 - <70	603	33	75	24	63	27
		70 - <80	567	31	78	25	72	30
		>=80	123	7	20	6	20	8
		Total	**1841**	**100**	**317**	**100**	**237**	**100**
2009	Male	20 - <30	3	0	15	2	3	1
		30 - <40	58	4	79	10	33	11
		40 - <50	253	16	233	29	74	25
		50 - <60	530	33	268	33	81	27
		60 - <70	478	30	146	18	61	21
		70 - <80	239	15	64	8	38	13
		>=80	52	3	12	1	6	2
		Total	**1613**	**100**	**817**	**100**	**296**	**100**
	Female	20 - <30	0	0	0	0	0	0
		30 - <40	8	1	3	2	1	2
		40 - <50	48	7	15	11	5	12
		50 - <60	160	23	29	21	11	26
		60 - <70	198	29	40	29	10	24
		70 - <80	208	30	36	26	11	26
		>=80	67	10	14	10	4	10
		Total	**689**	**100**	**137**	**100**	**42**	**100**

Year	Gender	Age group	Pre-morbid hypertension					
			Hypertensive		Non-Hypertensive		Unknown	
			No.	%	No.	%	No.	%
2010	Male	20 - <30	2	0	20	2	5	2
		30 - <40	56	4	81	10	33	11
		40 - <50	226	15	222	27	98	31
		50 - <60	519	35	280	34	96	31
		60 - <70	401	27	150	18	51	16
		70 - <80	221	15	68	8	23	7
		>=80	49	3	14	2	6	2
		Total	**1474**	**100**	**835**	**100**	**312**	**100**
	Female	20 - <30	0	0	0	0	0	0
		30 - <40	7	1	7	6	1	2
		40 - <50	41	7	12	9	4	9
		50 - <60	148	24	33	26	12	26
		60 - <70	163	27	35	28	11	24
		70 - <80	183	30	32	25	13	28
		>=80	65	11	8	6	5	11
		Total	**607**	**100**	**127**	**100**	**46**	**100**
2006-2010	Male	20 - <30	18	0	62	2	26	1
		30 - <40	249	3	340	9	167	9
		40 - <50	1130	16	1042	27	486	27
		50 - <60	2459	34	1249	33	575	31
		60 - <70	2062	29	724	19	354	19
		70 - <80	1061	15	328	9	175	10
		>=80	200	3	69	2	47	3
		Total	**7179**	**100**	**3814**	**100**	**1830**	**100**
	Female	20 - <30	1	0	1	0	1	0
		30 - <40	30	1	27	5	9	3
		40 - <50	242	8	74	13	40	12
		50 - <60	687	22	141	24	66	20
		60 - <70	964	31	150	26	84	26
		70 - <80	958	31	146	25	96	30
		>=80	255	8	42	7	29	9
		Total	**3137**	**100**	**581**	**100**	**325**	**100**

Note: *Percentage is to the nearest decimal point*

Table 2.4.4 Age-gender distribution of patients with ACS by pre-morbid dyslipidaemia, NCVD-ACS Registry, 2006-2010

Year	Gender	Age group	Pre-morbid dyslipidaemia					
			Dyslipidaemia		Non-Dyslipidaemia		Unknown	
			No.	%	No.	%	No.	%
2006-2008	Male	20 - <30	10	0	22	1	26	1
		30 - <40	93	4	157	7	166	6
		40 - <50	439	19	489	20	624	23
		50 - <60	802	34	801	33	906	34
		60 - <70	672	28	579	24	602	22
		70 - <80	311	13	293	12	307	11
		>=80	44	2	67	3	66	2
		Total	**2371**	**100**	**2408**	**100**	**2697**	**100**
	Female	20 - <30	1	0	1	0	1	0
		30 - <40	10	1	10	1	19	2
		40 - <50	77	8	81	12	73	9
		50 - <60	173	19	160	24	168	21
		60 - <70	310	34	193	29	238	29
		70 - <80	292	32	177	26	248	30
		>=80	45	5	48	7	70	9
		Total	**908**	**100**	**670**	**100**	**817**	**100**
2009	Male	20 - <30	5	1	10	1	6	1
		30 - <40	43	5	74	6	53	9
		40 - <50	180	20	249	21	131	21
		50 - <60	308	34	389	32	182	30
		60 - <70	243	27	294	25	148	24
		70 - <80	117	13	148	12	76	12
		>=80	18	2	35	3	17	3
		Total	**914**	**100**	**1199**	**100**	**613**	**100**
	Female	20 - <30	0	0	0	0	0	0
		30 - <40	4	1	6	2	2	1
		40 - <50	23	7	37	10	8	5
		50 - <60	77	23	87	22	36	24
		60 - <70	106	32	104	27	38	26
		70 - <80	97	29	109	28	49	33
		>=80	27	8	44	11	14	10
		Total	**334**	**100**	**387**	**100**	**147**	**100**

Year	Gender	Age group	Pre-morbid dyslipidaemia					
			Dyslipidaemia		Non-Dyslipidaemia		Unknown	
			No.	%	No.	%	No.	%
2010	Male	20 - <30	5	1	14	1	8	1
		30 - <40	41	5	69	6	60	8
		40 - <50	157	19	213	20	176	25
		50 - <60	302	36	352	33	241	34
		60 - <70	195	23	269	25	138	19
		70 - <80	109	13	129	12	74	10
		>=80	23	3	31	3	15	2
		Total	**832**	**100**	**1077**	**100**	**712**	**100**
	Female	20 - <30	0	0	0	0	0	0
		30 - <40	3	1	9	3	3	2
		40 - <50	12	5	34	10	11	6
		50 - <60	71	28	75	21	47	28
		60 - <70	79	31	85	24	45	26
		70 - <80	72	28	111	32	45	26
		>=80	21	8	38	11	19	11
		Total	**258**	**100**	**352**	**100**	**170**	**100**
2006-2010	Male	20 - <30	20	0	46	1	40	1
		30 - <40	177	4	300	6	279	7
		40 - <50	776	19	951	20	931	23
		50 - <60	1412	34	1542	33	1329	33
		60 - <70	1110	27	1142	24	888	22
		70 - <80	537	13	570	12	457	11
		>=80	85	2	133	3	98	2
		Total	**4117**	**100**	**4684**	**100**	**4022**	**100**
	Female	20 - <30	1	0	1	0	1	0
		30 - <40	17	1	25	2	24	2
		40 - <50	112	7	152	11	92	8
		50 - <60	321	21	322	23	251	22
		60 - <70	495	33	382	27	321	28
		70 - <80	461	31	397	28	342	30
		>=80	93	6	130	9	103	9
		Total	**1500**	**100**	**1409**	**100**	**1134**	**100**

Note: *Percentage is to the nearest decimal point*

Table 2.4.5 Age-gender distribution of patients with ACS by family history of premature cardiovascular disease, NCVD-ACS Registry, 2006-2010

Year	Gender	Age group	Family history of premature cardiovascular disease					
			Yes		No		Unknown	
			No.	%	No.	%	No.	%
2006-2008	Male	20 - <30	9	1	33	1	16	1
		30 - <40	93	10	204	5	119	5
		40 - <50	278	30	808	19	466	20
		50 - <60	326	35	1374	33	809	35
		60 - <70	168	18	1113	26	572	24
		70 - <80	49	5	566	13	296	13
		>=80	12	1	104	2	61	3
		Total	**935**	**100**	**4202**	**100**	**2339**	**100**
	Female	20 - <30	0	0	2	0	1	0
		30 - <40	7	4	22	2	10	1
		40 - <50	51	26	121	9	59	7
		50 - <60	54	27	280	21	167	20
		60 - <70	51	26	432	32	258	31
		70 - <80	33	17	406	30	278	33
		>=80	4	2	92	7	67	8
		Total	**200**	**100**	**1355**	**100**	**840**	**100**
2009	Male	20 - <30	1	0	15	1	5	1
		30 - <40	26	10	97	6	47	6
		40 - <50	89	34	334	20	137	17
		50 - <60	84	32	568	34	227	29
		60 - <70	45	17	408	24	232	30
		70 - <80	16	6	207	12	118	15
		>=80	4	2	46	3	20	3
		Total	**265**	**100**	**1675**	**100**	**786**	**100**
	Female	20 - <30	0	0	0	0	0	0
		30 - <40	2	3	7	1	3	1
		40 - <50	7	10	39	7	22	8
		50 - <60	17	24	122	23	61	23
		60 - <70	20	28	158	30	70	27
		70 - <80	17	24	154	29	84	32
		>=80	9	13	52	10	24	9
		Total	**72**	**100**	**532**	**100**	**264**	**100**

Year	Gender	Age group	Family history of premature cardiovascular disease					
			Yes		No		Unknown	
			No.	%	No.	%	No.	%
2010	Male	20 - <30	5	1	14	1	8	1
		30 - <40	48	14	71	5	51	7
		40 - <50	95	27	307	20	144	19
		50 - <60	129	37	530	35	236	31
		60 - <70	51	15	377	25	174	23
		70 - <80	18	5	183	12	111	15
		>=80	2	1	38	3	29	4
		Total	**348**	**100**	**1520**	**100**	**753**	**100**
	Female	20 - <30	0	0	0	0	0	0
		30 - <40	2	2	10	2	3	1
		40 - <50	13	16	31	7	13	5
		50 - <60	29	35	100	23	64	24
		60 - <70	14	17	120	28	75	28
		70 - <80	18	22	133	31	77	28
		>=80	6	7	33	8	39	14
		Total	**82**	**100**	**427**	**100**	**271**	**100**
2006-2010	Male	20 - <30	15	1	62	1	29	1
		30 - <40	167	11	372	5	217	6
		40 - <50	462	30	1449	20	747	19
		50 - <60	539	35	2472	33	1272	33
		60 - <70	264	17	1898	26	978	25
		70 - <80	83	5	956	13	525	14
		>=80	18	1	188	3	110	3
		Total	**1548**	**100**	**7397**	**100**	**3878**	**100**
	Female	20 - <30	0	0	2	0	1	0
		30 - <40	11	3	39	2	16	1
		40 - <50	71	20	191	8	94	7
		50 - <60	100	28	502	22	292	21
		60 - <70	85	24	710	31	403	29
		70 - <80	68	19	693	30	439	32
		>=80	19	5	177	8	130	9
		Total	**354**	**100**	**2314**	**100**	**1375**	**100**

Note: *Percentage is to the nearest decimal point*

Table 2.4.6 Age-gender distribution of patients with ACS by smoking status, NCVD-ACS Registry, 2006-2010

Year	Gender	Age group	Smoking status							
			Never		Former (quit more than 30 days)		Current (any tobacco used within 30 days)		Unknown	
			No.	%	No.	%	No.	%	No.	%
2006-2008	Male	20 - <30	8	0	3	0	45	1	2	0
		30 - <40	45	3	63	3	277	8	31	7
		40 - <50	292	17	272	13	932	29	56	12
		50 - <60	561	33	644	32	1145	35	159	34
		60 - <70	502	29	623	31	606	19	122	26
		70 - <80	252	15	350	17	231	7	78	17
		>=80	50	3	79	4	31	1	17	4
		Total	**1710**	**100**	**2034**	**100**	**3267**	**100**	**465**	**100**
	Female	20 - <30	2	0	0	0	1	1	0	0
		30 - <40	36	2	0	0	2	3	1	1
		40 - <50	208	10	5	4	7	9	11	6
		50 - <60	430	21	24	18	13	17	34	20
		60 - <70	628	31	35	27	25	32	53	31
		70 - <80	578	29	54	41	25	32	60	35
		>=80	134	7	13	10	4	5	12	7
		Total	**2016**	**100**	**131**	**100**	**77**	**100**	**171**	**100**
2009	Male	20 - <30	3	0	2	0	15	1	1	1
		30 - <40	28	4	42	5	96	9	4	6
		40 - <50	119	16	139	16	291	27	11	16
		50 - <60	227	31	267	31	363	34	22	32
		60 - <70	204	28	230	27	228	21	23	33
		70 - <80	125	17	140	16	69	6	7	10
		>=80	34	5	30	4	5	0	1	1
		Total	**740**	**100**	**850**	**100**	**1067**	**100**	**69**	**100**
	Female	20 - <30	0	0	0	0	0	0	0	0
		30 - <40	10	1	1	2	1	3	0	0
		40 - <50	58	8	6	9	2	6	2	7
		50 - <60	175	24	8	12	9	26	8	27
		60 - <70	213	29	17	26	7	20	11	37
		70 - <80	213	29	23	35	11	31	8	27
		>=80	68	9	11	17	5	14	1	3
		Total	**737**	**100**	**66**	**100**	**35**	**100**	**30**	**100**

Year	Gender	Age group	Smoking status							
			Never		Former (quit more than 30 days)		Current (any tobacco used within 30 days)		Unknown	
			No.	%	No.	%	No.	%	No.	%
2010	Male	20 - <30	7	1	2	0	16	1	2	1
		30 - <40	30	4	23	3	112	10	5	3
		40 - <50	102	15	90	13	331	29	23	15
		50 - <60	238	35	224	34	383	34	50	34
		60 - <70	186	27	190	28	196	17	30	20
		70 - <80	93	14	115	17	73	6	31	21
		>=80	24	4	23	3	14	1	8	5
		Total	**680**	**100**	**667**	**100**	**1125**	**100**	**149**	**100**
	Female	20 - <30	0	0	0	0	0	0	0	0
		30 - <40	13	2	0	0	2	6	0	0
		40 - <50	50	8	3	9	1	3	3	4
		50 - <60	164	26	4	11	9	26	16	22
		60 - <70	170	27	12	34	10	29	17	23
		70 - <80	184	29	8	23	10	29	26	35
		>=80	56	9	8	23	2	6	12	16
		Total	**637**	**100**	**35**	**100**	**34**	**100**	**74**	**100**
2006-2010	Male	20 - <30	18	1	7	0	76	1	5	1
		30 - <40	103	3	128	4	485	9	40	6
		40 - <50	513	16	501	14	1554	28	90	13
		50 - <60	1026	33	1135	32	1891	35	231	34
		60 - <70	892	28	1043	29	1030	19	175	26
		70 - <80	470	15	605	17	373	7	116	17
		>=80	108	3	132	4	50	1	26	4
		Total	**3130**	**100**	**3551**	**100**	**5459**	**100**	**683**	**100**
	Female	20 - <30	2	0	0	0	1	1	0	0
		30 - <40	59	2	1	0	5	3	1	0
		40 - <50	316	9	14	6	10	7	16	6
		50 - <60	769	23	36	16	31	21	58	21
		60 - <70	1011	30	64	28	42	29	81	29
		70 - <80	975	29	85	37	46	32	94	34
		>=80	258	8	32	14	11	8	25	9
		Total	**3390**	**100**	**232**	**100**	**146**	**100**	**275**	**100**

Note: *Percentage is to the nearest decimal point*

Table 2.5 Presence of cumulative risk factors, NCVD-ACS Registry, 2006-2010

Year	2006		2007		2008		2009		2010		Total	
Total	**3392**		**3640**		**2839**		**3594**		**3401**		**16866**	
Presence of cumulative risk factors*	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
None	141	4	156	4	184	6	159	4	171	5	811	5
1 risk factor	625	18	642	18	643	23	672	19	691	20	3273	19
2 risk factors	979	29	1067	29	807	28	1024	28	1048	31	4925	29
3 risk factors	933	28	976	27	706	25	992	28	892	26	4499	27
>3 risk factors	714	21	799	22	499	18	747	21	599	18	3358	20

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

Table 2.6 Summary of type of cardiac presentation for patients with ACS, NCVD-ACS Registry, 2006-2010

Year	2006		2007		2008		2009		2010		Total	
Total	**3392**		**3640**		**2839**		**3594**		**3401**		**16866**	
Acute coronary syndrome stratum	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**	**No**	**%**
STEMI	1427	42	1687	46	1533	54	1681	47	1802	53	8130	48
NSTEMI	1152	34	1063	29	689	24	1046	29	1008	30	4958	29
Unstable Angina (UA)	813	24	890	24	617	22	867	24	591	17	3778	22

Note: *Percentage is to the nearest decimal point*

Table 2.7 Characteristics of patients with ACS by ACS stratum, NCVD-ACS Registry, 2006-2010

Year	2006-2008			2009			2010			2006-2010		
ACS Stratum	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**
Total	**4647**	**2904**	**2320**	**1681**	**1046**	**867**	**1802**	**1008**	**591**	**8130**	**4958**	**3778**
DEMOGRAPHICS												
Age, years												
N	4647	2904	2320	1681	1046	867	1802	1008	591	8130	4958	3778
Mean (SD)	57 (12)	62 (12)	61 (12)	56 (12)	62 (12)	61 (12)	56 (12)	62 (12)	60 (12)	56 (12)	62 (12)	61 (12)
Median (min, max)	56 (21, 95)	62 (22, 100)	61 (24, 92)	56 (22, 92)	62 (27, 97)	61 (29, 94)	56 (20, 90)	62 (21, 97)	59 (31, 91)	56 (20, 95)	62 (21, 100)	61 (24, 94)
IQR	17	17	17	17	17	17	15	18	17	16	17	17
Age group, No. (%)												
20 - <30	46 (1)	9 (0)	6 (0)	17 (1)	3 (0)	1 (0)	22 (1)	5 (0)	0 (0)	85 (1)	17 (0)	7 (0)
30 - <40	298 (6)	78 (3)	79 (3)	128 (8)	28 (3)	26 (3)	124 (7)	38 (4)	23 (4)	550 (7)	144 (3)	128 (3)
40 - <50	1074 (23)	360 (12)	349 (15)	380 (23)	124 (12)	124 (14)	396 (22)	119 (12)	88 (15)	1850 (23)	603 (12)	561 (15)
50 - <60	1482 (32)	840 (29)	688 (30)	529 (31)	296 (28)	254 (29)	611 (34)	275 (27)	202 (34)	2622 (32)	1411 (28)	1144 (30)
60 - <70	1079 (23)	853 (29)	662 (29)	379 (23)	317 (30)	237 (27)	394 (22)	276 (27)	141 (24)	1852 (23)	1446 (29)	1040 (28)
70 - <80	557 (12)	626 (22)	445 (19)	208 (12)	209 (20)	179 (21)	210 (12)	220 (22)	110 (19)	975 (12)	1055 (21)	734 (19)
≥ 80	111 (2)	138 (5)	91 (4)	40 (2)	69 (7)	46 (5)	45 (2)	75 (7)	27 (5)	196 (2)	282 (6)	164 (4)
Gender, No. (%)												
Male	3943 (85)	2011 (69)	1522 (66)	1452 (86)	740 (71)	534 (62)	1546 (86)	700 (69)	375 (63)	6941 (85)	3451 (70)	2431 (64)
Female	704 (15)	893 (31)	798 (34)	229 (14)	306 (29)	333 (38)	256 (14)	308 (31)	216 (37)	1189 (15)	1507 (30)	1347 (36)

Year	2006-2008			2009			2010			2006-2010		
ACS Stratum	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**
Total	**4647**	**2904**	**2320**	**1681**	**1046**	**867**	**1802**	**1008**	**591**	**8130**	**4958**	**3778**
Ethnic group, No. (%)												
Malay	2515 (54)	1323 (46)	981 (42)	932 (55)	483 (46)	372 (43)	1019 (57)	455 (45)	238 (40)	4466 (55)	2261 (46)	1591 (42)
Chinese	958 (21)	710 (24)	627 (27)	318 (19)	230 (22)	216 (25)	338 (19)	221 (22)	138 (23)	1614 (20)	1161 (23)	981 (26)
Indian	874 (19)	726 (25)	641 (28)	331 (20)	277 (26)	258 (30)	297 (16)	289 (29)	194 (33)	1502 (18)	1292 (26)	1093 (29)
Orang Asli	1 (0)	1 (0)	0 (0)	1 (0)	0 (0)	0 (0)	3 (0)	1 (0)	0 (0)	5 (0)	2 (0)	0 (0)
Kadazan	27 (1)	8 (0)	1 (0)	14 (1)	7 (1)	1 (0)	22 (1)	11 (1)	2 (0)	63 (1)	26 (1)	4 (0)
Melanau	1 (0)	0 (0)	1 (0)	2 (0)	0 (0)	0 (0)	3 (0)	0 (0)	0 (0)	6 (0)	0 (0)	1 (0)
Murut	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	1 (0)	0 (0)	1 (0)	1 (0)	0 (0)
Bajau	40 (1)	11 (0)	2 (0)	10 (1)	3 (0)	2 (0)	28 (2)	7 (1)	1 (0)	78 (1)	21 (0)	5 (0)
Bidayuh	27 (1)	21 (1)	4 (0)	7 (0)	2 (0)	0 (0)	6 (0)	0 (0)	0 (0)	40 (0)	23 (0)	4 (0)
Iban	54 (1)	47 (2)	19 (1)	16 (1)	16 (2)	3 (0)	14 (1)	3 (0)	2 (0)	84 (1)	66 (1)	24 (1)
Sikh	8 (0)	6 (0)	8 (0)	4 (0)	4 (0)	5 (1)	2 (0)	3 (0)	5 (1)	14 (0)	13 (0)	18 (0)
Other Malaysian	48 (1)	27 (1)	25 (1)	12 (1)	12 (1)	6 (1)	33 (2)	9 (1)	4 (1)	93 (1)	48 (1)	35 (1)
Foreigner	94 (2)	24 (1)	11 (0)	33 (2)	12 (1)	4 (0)	37 (2)	8 (1)	7 (1)	164 (2)	44 (1)	22 (1)
OTHER CORONARY RISK FACTORS												
Smoking Status, No. (%)												
Never	1330 (29)	1322 (46)	1074 (46)	517 (31)	485 (46)	475 (55)	546 (30)	463 (46)	308 (52)	2393 (29)	2270 (46)	1857 (49)
Former (quit >30 days)	838 (18)	707 (24)	620 (27)	359 (21)	300 (29)	257 (30)	325 (18)	231 (23)	146 (25)	1522 (19)	1238 (25)	1023 (27)
Current (any tobacco use within last 30 days)	2252 (48)	690 (24)	402 (17)	750 (45)	238 (23)	114 (13)	843 (47)	221 (22)	95 (16)	3845 (47)	1149 (23)	611 (16)
Unknown	227 (5)	185 (6)	224 (10)	55 (3)	23 (2)	21 (2)	88 (5)	93 (9)	42 (7)	370 (5)	301 (6)	287 (8)

Year	**2006-2008**			**2009**			**2010**			**2006-2010**		
ACS Stratum	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**
Total	**4647**	**2904**	**2320**	**1681**	**1046**	**867**	**1802**	**1008**	**591**	**8130**	**4958**	**3778**
Family history of Premature Cardiovascular Disease, No. (%)												
Yes	531 (11)	332 (11)	272 (12)	186 (11)	79 (8)	72 (8)	221 (12)	108 (11)	101 (17)	938 (12)	519 (10)	445 (12)
No	2669 (57)	1577 (54)	1311 (57)	1049 (62)	586 (56)	572 (66)	1086 (60)	558 (55)	303 (51)	4804 (59)	2721 (55)	2186 (58)
Unknown	1447 (31)	995 (34)	737 (32)	446 (27)	381 (36)	223 (26)	495 (27)	342 (34)	187 (32)	2388 (29)	1718 (35)	1147 (30)
Anthropometric												
Body Mass Index (BMI), kg/m^2												
N	2610	1692	1138	941	490	419	861	333	166	4412	2515	1723
Mean (SD)	25.59 (4.15)	25.43 (4.20)	25.94 (4.60)	25.59 (4.01)	26.5 (5.08)	25.48 (4.46)	25.92 (4.64)	26.09 (4.32)	25.96 (4.92)	25.65 (4.22)	25.72 (4.42)	25.83 (4.60)
Median (min, max)	25.10 (13.15, 60.39)	24.97 (13.85, 59.93)	25.30 (13.28, 51.92)	25.39 (14.52, 48.98)	25.61 (14.73, 59.17)	24.77 (15.43, 65.32)	25.44 (14.24, 64.45)	25.95 (14.46, 46.88)	25.10 (17.48, 47.77)	25.28 (13.15, 64.45)	25.16 (13.85, 59.93)	25.10 (13.28, 65.32)
IQR	4.72	5.01	5.19	5.08	4.91	4.19	5.10	5.35	5.47	4.85	5.06	4.91
BMI, kg/ m^2, No (%)												
<18.5	65 (2)	52 (3)	30 (3)	24 (3)	6 (1)	8 (2)	20 (2)	9 (3)	3 (2)	109 (2)	67 (3)	41 (2)
18.5 – 23.0	588 (23)	430 (25)	243 (21)	218 (23)	83 (17)	102 (24)	194 (23)	68 (20)	40 (24)	1000 (23)	581 (23)	385 (22)
>23.0	1957 (75)	1210 (72)	865 (76)	699 (74)	401 (82)	309 (74)	647 (75)	256 (77)	123 (74)	3303 (75)	1867 (74)	1297 (75)
Waist-Hip Ratio												
N	2205	1207	849	751	246	286	548	150	55	3504	1603	1190
Mean (SD)	.96 (.07)	.96 (.08)	.96 (.09)	.96 (.08)	.96 (.10)	.96 (.08)	.96 (.10)	.97 (.08)	.97 (.07)	.96 (.08)	.96 (.08)	.96 (.09)
Median (min, max)	.96 (.38, 1.63)	.96 (.36, 1.61)	.96 (.46, 1.85)	.96 (.68, 2.02)	.96 (.52, 1.84)	.96 (.52, 1.15)	.95 (.36, 1.58)	.97 (.71, 1.18)	.96 (.83, 1.14)	.96 (.36, 2.02)	.96 (.36, 1.84)	.96 (.46, 1.85)
IQR	0.07	0.07	0.09	0.07	0.09	0.08	0.10	0.10	0.08	0.07	0.07	0.09

Year	2006-2008			2009			2010			2006-2010		
ACS Stratum	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**
Total	**4647**	**2904**	**2320**	**1681**	**1046**	**867**	**1802**	**1008**	**591**	**8130**	**4958**	**3778**
WHR, No. (%)												
Men	1906	876	578	664	185	196	484	127	37	3054	1188	811
≤1.0	1506 (79)	660 (75)	420 (73)	525 (79)	128 (69)	136 (69)	359 (74)	87 (69)	25 (68)	2390 (78)	875 (74)	581 (72)
> 1.0	400 (21)	216 (25)	158 (27)	139 (21)	57 (31)	60 (31)	125 (26)	40 (31)	12 (32)	664 (22)	313 (26)	230 (28)
Women	299	331	271	87	61	90	64	23	18	450	415	379
≤ 0.85	30 (10)	46 (14)	33 (12)	7 (8)	9 (15)	10 (11)	12 (19)	4 (17)	2 (11)	49 (11)	59 (14)	45 (12)
> 0.85	269 (90)	285 (86)	238 (88)	80 (92)	52 (85)	80 (89)	52 (81)	19 (83)	16 (89)	401 (89)	356 (86)	334 (88)
Waist circumference, cm												
N	2322	1286	917	777	259	299	594	168	64	3693	1713	1280
Mean (SD)	88.4 (14.1)	88.4 (14.2)	89.2 (16.1)	88.7 (13.2)	89 (16.1)	90.7 (14.6)	88.4 (17.6)	91.3 (17.5)	89.4 (16.1)	88.4 (14.6)	88.8 (14.9)	89.5 (15.8)
Median (min, max)	89 (36, 153)	89 (36, 162)	91 (36, 152)	89 (36, 192)	90 (36, 162)	90 (39, 170)	90 (36, 181)	93 (36, 162)	92 40, 115)	89 (36, 192)	89 (36, 162)	91 (36, 170)
IQR	15	14	15	14	17.5	16	16	16	16	15	15	16
Waist circumference, cm, No. (%)												
Men	2004	923	615	687	195	206	526	142	42	3217	1260	863
≤ 90	1087 (54)	526 (57)	302 (49)	386 (56)	99 (51)	93 (45)	272 (52)	62 (44)	16 (38)	1745 (54)	687 (55)	411 (48)
>90	917 (46)	397 (43)	313 (51)	301 (44)	96 (49)	113 (55)	254 (48)	80 (56)	26 (62)	1472 (46)	573 (45)	452 (52)
Women	318	363	302	90	64	93	68	26	22	476	453	417
≤ 80	80 (25)	91 (25)	64 (21)	25 (28)	16 (25)	22 (24)	22 (32)	8 (31)	6 (27)	127 (27)	115 (25)	92 (22)
>80	238 (75)	272 (75)	238 (79)	65 (72)	48 (75)	71 (76)	46 (68)	18 (69)	16 (73)	349 (73)	338 (75)	325 (78)

Year	2006-2008			2009			2010			2006-2010		
ACS Stratum	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**
Total	**4647**	**2904**	**2320**	**1681**	**1046**	**867**	**1802**	**1008**	**591**	**8130**	**4958**	**3778**
CO-MORBIDITY												
Dyslipidaemia, No. (%)												
Yes	1005 (22)	1189 (41)	1085 (47)	502 (30)	398 (38)	348 (40)	499 (28)	356 (35)	235 (40)	2006 (25)	1943 (39)	1668 (44)
No	1630 (35)	844 (29)	604 (26)	723 (43)	469 (45)	394 (45)	731 (41)	446 (44)	252 (43)	3084 (38)	1759 (35)	1250 (33)
Unknown	2012 (43)	871 (30)	631 (27)	456 (27)	179 (17)	125 (14)	572 (32)	206 (20)	104 (18)	3040 (37)	1256 (25)	860 (23)
Hypertension, No. (%)												
Yes	2247 (48)	1994 (69)	1692 (73)	854 (51)	761 (73)	687 (79)	881 (49)	751 (75)	449 (76)	3982 (49)	3506 (71)	2828 (75)
No	1504 (32)	588 (20)	387 (17)	606 (36)	212 (20)	136 (16)	659 (37)	189 (19)	114 (19)	2769 (34)	989 (20)	637 (17)
Unknown	896 (19)	322 (11)	241 (10)	221 (13)	73 (7)	44 (5)	262 (15)	68 (7)	28 (5)	1379 (17)	463 (9)	313 (8)
Diabetes, No. (%)												
Yes	1646 (35)	1427 (49)	1100 (47)	623 (37)	517 (49)	424 (49)	700 (39)	519 (51)	289 (49)	2969 (37)	2463 (50)	1813 (48)
No	1975 (43)	1071 (37)	899 (39)	804 (48)	412 (39)	355 (41)	795 (44)	390 (39)	249 (42)	3574 (44)	1873 (38)	1503 (40)
Unknown	1026 (22)	406 (14)	321 (14)	254 (15)	117 (11)	88 (10)	307 (17)	99 (10)	53 (9)	1587 (20)	622 (13)	462 (12)
Fasting blood glucose, mmol/L												
N	3627	1958	1558	1338	683	714	1320	632	385	6285	3273	2657
Mean (SD)	8.3 (3.8)	7.9 (3.8)	7.5 (3.6)	8.1 (3.6)	7.7 (3.4)	7.2 (3.0)	8.4 (3.8)	7.7 (3.6)	7.1 (2.8)	8.3 (3.8)	7.8 (3.7)	7.3 (3.3)
Median (min, max)	7.0 (3.0, 29.8)	6.6 (3.0, 28.5)	6.0 (3.0, 29.9)	6.9 (3.0, 29.7)	6.5 (3.2, 29.9)	6.2 (3.1, 23.8)	7.2 (3.4, 29.8)	6.6 (3.1, 29.9)	6.1 (3.0, 24.1)	7.0 (3.0, 29.8)	6.5 (3.0, 29.9)	6.1 (3.0, 29.9)
IQR	3.8	3.7	3.5	3.2	3.0	2.2	3.6	3.4	3.0	3.7	3.4	3.0
Myocardial infarction history, No. (%)												
Yes	447 (10)	616 (21)	528 (23)	259 (15)	382 (37)	282 (33)	177 (10)	299 (30)	202 (34)	883 (11)	1297 (26)	1012 (27)
No	3153 (68)	1647 (57)	1285 (55)	1137 (68)	527 (50)	431 (50)	1298 (72)	582 (58)	312 (53)	5588 (69)	2756 (56)	2028 (54)
Unknown	1047 (23)	641 (22)	507 (22)	285 (17)	137 (13)	154 (18)	327 (18)	127 (13)	77 (13)	1659 (20)	905 (18)	738 (20)

Year	2006-2008			2009			2010			2006-2010		
ACS Stratum	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**
Total	**4647**	**2904**	**2320**	**1681**	**1046**	**867**	**1802**	**1008**	**591**	**8130**	**4958**	**3778**
Documented CAD>50% stenosis, No. (%)												
Yes	267 (6)	663 (23)	642 (28)	163 (10)	308 (29)	258 (30)	110 (6)	253 (25)	189 (32)	540 (7)	1224 (25)	1089 (29)
No	2980 (64)	1487 (51)	1052 (45)	1051 (63)	484 (46)	385 (44)	1218 (68)	561 (56)	300 (51)	5249 (65)	2532 (51)	1737 (46)
Unknown	1400 (30)	754 (26)	626 (27)	467 (28)	254 (24)	224 (26)	474 (26)	194 (19)	102 (17)	2341 (29)	1202 (24)	952 (25)
Chronic angina (onset more than 2 weeks ago), No. (%)												
Yes	264 (6)	410 (14)	466 (20)	115 (7)	181 (17)	134 (15)	112 (6)	130 (13)	100 (17)	491 (6)	721 (15)	700 (19)
No	3308 (71)	1920 (66)	1425 (61)	1265 (75)	712 (68)	581 (67)	1358 (75)	767 (76)	426 (72)	5931 (73)	3399 (69)	2432 (64)
Unknown	1075 (23)	574 (20)	429 (18)	301 (18)	153 (15)	152 (18)	332 (18)	111 (11)	65 (11)	1708 (21)	838 (17)	646 (17)
New onset angina (less than 2 weeks ago), No. (%)												
Yes	2234 (48)	1426 (49)	1160 (50)	1055 (63)	712 (68)	662 (76)	954 (53)	687 (68)	410 (69)	4243 (52)	2825 (57)	2232 (59)
No	1532 (33)	1053 (36)	806 (35)	455 (27)	287 (27)	170 (20)	593 (33)	247 (25)	136 (23)	2580 (32)	1587 (32)	1112 (29)
Unknown	881 (19)	425 (15)	354 (15)	171 (10)	47 (4)	35 (4)	255 (14)	74 (7)	45 (8)	1307 (16)	546 (11)	434 (11)
Heart failure, No. (%)												
Yes	138 (3)	330 (11)	202 (9)	64 (4)	133 (13)	74 (9)	65 (4)	157 (16)	69 (12)	267 (3)	620 (13)	345 (9)
No	3503 (75)	2066 (71)	1691 (73)	1413 (84)	825 (79)	705 (81)	1460 (81)	766 (76)	452 (76)	6376 (78)	3657 (74)	2848 (75)
Unknown	1006 (22)	508 (17)	427 (18)	204 (12)	88 (8)	88 (10)	277 (15)	85 (8)	70 (12)	1487 (18)	681 (14)	585 (15)
Chronic lung disease, No. (%)												
Yes	113 (2)	117 (4)	92 (4)	32 (2)	57 (5)	45 (5)	53 (3)	71 (7)	23 (4)	198 (2)	245 (5)	160 (4)
No	3513 (76)	2267 (78)	1800 (78)	1431 (85)	894 (85)	725 (84)	1469 (82)	851 (84)	494 (84)	6413 (79)	4012 (81)	3019 (80)
Unknown	1021 (22)	520 (18)	428 (18)	218 (13)	95 (9)	97 (11)	280 (16)	86 (9)	74 (13)	1519 (19)	701 (14)	599 (16)

Year	2006-2008			2009			2010			2006-2010		
ACS Stratum	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**
Total	**4647**	**2904**	**2320**	**1681**	**1046**	**867**	**1802**	**1008**	**591**	**8130**	**4958**	**3778**
Renal disease, No. (%)												
Yes	152 (3)	336 (12)	155 (7)	57 (3)	133 (13)	63 (7)	54 (3)	145 (14)	59 (10)	263 (3)	614 (12)	277 (7)
No	3466 (75)	2057 (71)	1732 (75)	1354 (81)	754 (72)	589 (68)	1454 (81)	764 (76)	430 (73)	6274 (77)	3575 (72)	2751 (73)
Unknown	1029 (22)	511 (18)	433 (19)	270 (16)	159 (15)	215 (25)	294 (16)	99 (10)	102 (17)	1593 (20)	769 (16)	750 (20)
Cerebrovascular disease, No. (%)												
Yes	128 (3)	132 (5)	95 (4)	39 (2)	43 (4)	34 (4)	38 (2)	51 (5)	39 (7)	205 (3)	226 (5)	168 (4)
No	3510 (76)	2255 (78)	1792 (77)	1375 (82)	823 (79)	619 (71)	1477 (82)	847 (84)	452 (76)	6362 (78)	3925 (79)	2863 (76)
Unknown	1009 (22)	517 (18)	433 (19)	267 (16)	180 (17)	214 (25)	287 (16)	110 (11)	100 (17)	1563 (19)	807 (16)	747 (20)
Peripheral vascular disease, No. (%)												
Yes	14 (0)	46 (2)	20 (1)	7 (0)	9 (1)	4 (0)	4 (0)	13 (1)	4 (1)	25 (0)	68 (1)	28 (1)
No	3590 (77)	2297 (79)	1838 (79)	1383 (82)	834 (80)	634 (73)	1484 (82)	871 (86)	479 (81)	6457 (79)	4002 (81)	2951 (78)
Unknown	1043 (22)	561 (19)	462 (20)	291 (17)	203 (19)	229 (26)	314 (17)	124 (12)	108 (18)	1648 (20)	888 (18)	799 (21)
None of the above, No. (%)												
Yes	178 (4)	37 (1)	20 (1)	57 (3)	11 (1)	2 (0)	59 (3)	15 (1)	3 (1)	294 (4)	63 (1)	25 (1)
No	3883 (84)	2680 (92)	2137 (92)	1489 (89)	1010 (97)	856 (99)	1553 (86)	964 (96)	576 (97)	6925 (85)	4654 (94)	3569 (94)
Unknown	586 (13)	187 (6)	163 (7)	135 (8)	25 (2)	9 (1)	190 (11)	29 (3)	12 (2)	911 (11)	241 (5)	184 (5)
Coronary artery disease, No. (%)												
Yes	2605 (56)	1992 (69)	1748 (75)	1187 (71)	883 (84)	798 (92)	1085 (60)	837 (83)	515 (87)	4877 (60)	3712 (75)	3061 (81)
No	1077 (23)	496 (17)	266 (11)	277 (16)	100 (10)	38 (4)	423 (23)	94 (9)	38 (6)	1777 (22)	690 (14)	342 (9)
Unknown	965 (21)	416 (14)	306 (13)	217 (13)	63 (6)	31 (4)	294 (16)	77 (8)	38 (6)	1476 (18)	556 (11)	375 (10)

'Unknown' includes patients who do not know their co-morbidities and missing data

**Coronary artery disease is defined as "Yes" to 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

Table 2.8 Age-Gender distribution of patients with ACS by ACS stratum, NCVD-ACS Registry, 2006-2010

Year	Gender	Age group	ACS Stratum					
			STEMI		NSTEMI		UA	
			No.	%	No.	%	No.	%
2006-2008	Male	20 - <30	44	1	9	0	5	0
		30 - <40	280	7	68	3	68	4
		40 - <50	1001	25	307	15	244	16
		50 - <60	1328	34	675	34	506	33
		60 - <70	877	22	565	28	411	27
		70 - <80	347	9	319	16	245	16
		>=80	66	2	68	3	43	3
		Total	**3943**	**100**	**2011**	**100**	**1522**	**100**
	Female	20 - <30	2	0	0	0	1	0
		30 - <40	18	3	10	1	11	1
		40 - <50	73	10	53	6	105	13
		50 - <60	154	22	165	18	182	23
		60 - <70	202	29	288	32	251	31
		70 - <80	210	30	307	34	200	25
		>=80	45	6	70	8	48	6
		Total	**704**	**100**	**893**	**100**	**798**	**100**
2009	Male	20 - <30	17	1	3	0	1	0
		30 - <40	124	9	25	3	21	4
		40 - <50	361	25	112	15	87	16
		50 - <60	472	33	232	31	175	33
		60 - <70	315	22	225	30	145	27
		70 - <80	141	10	113	15	87	16
		>=80	22	2	30	4	18	3
		Total	**1452**	**100**	**740**	**100**	**534**	**100**
	Female	20 - <30	0	0	0	0	0	0
		30 - <40	4	2	3	1	5	2
		40 - <50	19	8	12	4	37	11
		50 - <60	57	25	64	21	79	24
		60 - <70	64	28	92	30	92	28
		70 - <80	67	29	96	31	92	28
		>=80	18	8	39	13	28	8
		Total	**229**	**100**	**306**	**100**	**333**	**100**

Year	Gender	Age group	ACS Stratum					
			STEMI		NSTEMI		UA	
			No.	%	No.	%	No.	%
2010	Male	20 - <30	22	1	5	1	0	0
		30 - <40	121	8	29	4	20	5
		40 - <50	375	24	106	15	65	17
		50 - <60	543	35	221	32	131	35
		60 - <70	313	20	195	28	94	25
		70 - <80	142	9	111	16	59	16
		>=80	30	2	33	5	6	2
		Total	**1546**	**100**	**700**	**100**	**375**	**100**
	Female	20 - <30	0	0	0	0	0	0
		30 - <40	3	1	9	3	3	1
		40 - <50	21	8	13	4	23	11
		50 - <60	68	27	54	18	71	33
		60 - <70	81	32	81	26	47	22
		70 - <80	68	27	109	35	51	24
		>=80	15	6	42	14	21	10
		Total	**256**	**100**	**308**	**100**	**216**	**100**
2006-2010	Male	20 - <30	83	1	17	0	6	0
		30 - <40	525	8	122	4	109	4
		40 - <50	1737	25	525	15	396	16
		50 - <60	2343	34	1128	33	812	33
		60 - <70	1505	22	985	29	650	27
		70 - <80	630	9	543	16	391	16
		>=80	118	2	131	4	67	3
		Total	**6941**	**100**	**3451**	**100**	**2431**	**100**
	Female	20 - <30	2	0	0	0	1	0
		30 - <40	25	2	22	1	19	1
		40 - <50	113	10	78	5	165	12
		50 - <60	279	23	283	19	332	25
		60 - <70	347	29	461	31	390	29
		70 - <80	345	29	512	34	343	25
		>=80	78	7	151	10	97	7
		Total	**1189**	**100**	**1507**	**100**	**1347**	**100**

Note: *Percentage is to the nearest decimal point*

CHAPTER 3 :
CLINICAL PRESENTATIONS & INVESTIGATIONS

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CHAPTER 3: CLINICAL PRESENTATIONS & INVESTIGATIONS

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Summary

1. Cardiac presentation of patients with ACS for period 2006-2008 and 2009-2010 were almost similar for STEMI (47% in 2006-2008 and 50% in 2009-2010) and NSTEMI (29% in both periods).
2. Majority of patients with ACS presented with low TIMI score.
3. Patients who represented with STEMI had higher levels of LDL-C compared to those with NSTEMI/UA.
4. Patients of younger age group (age 20 to 40 years) had higher level of lipids.
5. Median door-to-needle time is 50mins for 2006-2010. However, there was an encouraging downtrend in DNT over the five-year period. Longer DNT was observed amongst elderly, diabetic and females.

This chapter presents the results of clinical presentation and investigations of patients who were notified and registered in the ACS registry in year 2006 to 2010.
The outlines of the discussion are:

1. Epidemiology
2. Clinical presentation
3. Diagnosis
4. Risk factors: diabetes, dyslipidemia, hypertension
5. Timeliness to treatment
6. Discussion

Epidemiology & Clinical Presentation

Referring to NCVD-ACS registry from 2006 to 2010, majority of patients presented with STEMI (48%), followed by NSTEMI (30%) and unstable angina (22%). [Table 3.1] Patients with ACS had a male preponderance over female (76% male, 24% female). More male patients have STEMI relative to female patients. However, for NSTEMI and unstable angina, females have relatively higher percentage compared to males. The similar trend was observed over five years (2006-2010). [Table 3.3]

Elderly or female patients tend to have higher systolic blood pressure on presentation. Young ACS patients have higher total cholesterol, LDL, TG and lower HDL as compared to their counterparts. Unhealthy lifestyles, poor unbalanced diet may contribute to these findings. Whereas, less severe clinical presentation (NSTEMI/UA) in the middle and elderly aged groups may be explained by possible presence of collaterals.

The majority of patients with STEMI present with Killip class I (54%), II (19%), III (4%) and IV (6%). For NSTEMI, majority of patients presented with Killip class I (43%), II (18%), III (6%) and IV (3%). Similar trend was observed for unstable angina patients. If respective Killip class was assessed individually, Killip II/III was more common in STEMI/NSTEMI than in unstable angina group; Killip IV was common in STEMI than NSTEMI/UA.

With regards to TIMI risk score, the majority of patients with ACS presented with low TIMI score. Approximately 55% of ACS patients presented with low TIMI score (<2); 37.5% with intermediate score (3-4); and minority of 7.6% with high score (5-7). There was a subtle up trending in intermediate TIMI score over five-year period.

There was a trend towards patients presenting early (at 0-2 episodes of angina), with median pain to needle time was about four hours (240mins). This may be due to increasing public awareness due to media education and MY health portal (a portal to educate the public on coronary artery disease).

Diagnosis

ECG patterns for STEMI revealed that anterior territory was the commonest affected (57%), followed by inferior (46%), lateral involvement in 23%, true posterior and right ventricular in 8%, respectively. Similar trends observed across gender and age groups.

More than 90% of patients had biomarkers: CKMB, CK, Troponin T or I assayed at presentation. CK was the most widely used biomarker, followed by CKMB and Troponin T or I. Interestingly, we observed higher peak CK in male as compared to female patients (50% vs. 30%).

Echocardiography: Left ventricular ejection fraction (EF) averaged at 46% in STEMI, 47% in NSTEMI, and 51% in unstable angina. No obvious difference amongst gender and age groups. However, diabetics had lower EF on presentation (45% in diabetic vs. 48% in non diabetic).

Risk Factors

1. Dyslipidaemia:
A trend of higher mean total cholesterol was seen in STEMI (5.45mmol/L); NSTEMI (5.19mmol/L); and unstable angina (5.06mmol/L), respectively. A similar trend was recorded with highest LDL-cholesterol in the STEMI group (3.51mmol/L) as compared to NSTEMI and unstable angina groups (3.2 and 3.1mmol/L), respectively. [Table 3.1]

In term of age group, the LDL cholesterols were notably highest amongst young ACS with 3.66mmol/L as compared to 3.48mmol/L (middle aged group) and 3.14mmol/L (elderly aged group). However, the mean HDL-C (1.1mmol/L) and mean triglyceride (2.0mmol/L) were similar for the three aged groups; and no difference in lipid profile between males and females. [Table 3.2 and Table 3.3]

2. Diabetics:
Overall, 41% of the STEMI cases were diabetic and the other 59% diabetic ACS presented as NSTEMI/UA. Systolic blood pressure and mean triglyceride level were higher in diabetics as compared to non-diabetics. Similar in term of diastolic blood pressure, Killip classes, mean total cholesterol and LDL. [Table 3.4]

3. Hypertension:
Mean systolic blood pressure was lower in STEMI (134mmHg), as compared to NSTEMI/UA (142-144mmHg). The diastolic blood pressure, heart rate, and pulse pressure were similar in all three clinical presentations. Females and the elderly tend to present with higher systolic blood pressure. However, diastolic blood pressure, pulse pressure, and heart rate were similar across age and gender groups.

Timeliness to Treatment

Overall, amongst the 4,000 or so STEMI patients, between years 2006-2010, the median pain-to-needle time was 240 mins (4hours), whereas the median door-to-needle (DNT) was 50mins. The difference of pre-hospital pain-to-door time was approximately 190 mins (three hours).

There was an encouraging downward trend in median DNT over five-year period: 60mins (2006), 53mins (2007), 50mins (2008), and 45mins in both 2009 and 2010. Continuous efforts in education, organizational change, triage-diagnosis-decision teamwork are needed to ensure continual improvement in timely diagnosis and reperfusion, in order to achieve the DNT benchmark of within 30mins.

Discussion

The findings may not reflect the level of practice of ACS in Malaysia, as majority of the notifications were from tertiary centers/ hospitals, with cardiac care units.

NSTEMI-ACS may be under-diagnosed in settings where newer biomarkers (Troponins) were not consistently available.

The median DNT was longer in female, elderly, diabetic patients due to pre-hospital delay, atypical presentations and lack of awareness, ECG-delay, or decision delay due to perceived risk/benefit of thrombolytic therapy (especially in elderly).

Table 3.1 Cardiac presentation of patients with ACS by ACS stratum, NCVD-ACS Registry, 2006-2010

Year	2006-2008			2009			2010			2006-2010		
ACS Stratum	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**
Total	**4647**	**2904**	**2320**	**1681**	**1046**	**867**	**1802**	**1008**	**591**	**8130**	**4958**	**3778**
Systolic blood pressure, mmHg												
N	4559	2840	2289	1654	1025	853	1771	987	586	7984	4852	3728
Mean (SD)	135 (29)	143 (30)	145 (27)	135 (28)	140 (29)	143 (26)	133 (28)	142 (28)	145 (26)	134 (28)	142 (30)	144 (27)
Median (min, max)	132 (60, 230)	140 (64, 230)	142 (60, 230)	132 (60, 228)	139 (63, 226)	142 (67, 228)	131 (60, 229)	140 (65, 230)	141 (82, 221)	132 (60, 230)	140 (63, 230)	142 (60, 230)
IQR	38	41	36	37	38	32	35	36	35	37	39	35
Diastolic blood pressure, mmHg												
N	4423	2786	2262	1609	1016	837	1725	962	574	7757	4764	3673
Mean (SD)	80 (17)	82 (17)	82 (14)	81 (17)	81 (16)	81 (14)	80 (17)	81 (16)	82 (14)	80 (17)	81 (16)	82 (14)
Median (min, max)	80 (22, 120)	81 (19, 120)	81 (32, 120)	80 (24, 120)	80 (34, 120)	81 (36, 119)	80 (29, 120)	81 (22, 120)	81 (26, 120)	80 (22, 120)	80 (19, 120)	81 (26, 120)
IQR	23	23	20	23	23	18	22	21	19	23	22	19
Pulse pressure, mmHg												
N	4399	2757	2250	1598	1008	836	1722	953	574	7719	4718	3660
Mean (SD)	53 (18)	60 (22)	62 (21)	52 (18)	58 (21)	61 (21)	52 (17)	60 (21)	62 (20)	52 (18)	60 (21)	62 (21)
Median (min, max)	50 (2, 133)	58 (2, 154)	60 (10, 144)	50 (6, 130)	55 (11, 146)	60 (3, 137)	50 (5, 128)	57 (7, 159)	60 (20, 140)	50 (2, 133)	57 (2, 159)	60 (3, 144)
IQR	22	29	27	22	26	27	21	26	27	22	28	27
Heart rate at presentation, beats/min												
N	4542	2854	2291	1653	1033	859	1772	991	583	7967	4878	3733
Mean (SD)	83 (22)	86 (22)	81 (19)	83 (21)	85 (21)	83 (20)	83 (22)	88 (22)	80 (18)	83 (22)	86 (22)	82 (19)
Median (min, max)	80 (30, 200)	84 (29, 191)	80 (30, 176)	81 (25, 180)	83 (30, 189)	81 (38, 183)	80 (28, 180)	86 (25, 181)	78 (42, 157)	80 (25, 200)	84 (25, 191)	80 (30, 183)
IQR	28	30	24	27	28	24	29	28	23	28	30	24

Year	2006-2008			2009			2010			2006-2010		
ACS Stratum	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**
Total	**4647**	**2904**	**2320**	**1681**	**1046**	**867**	**1802**	**1008**	**591**	**8130**	**4958**	**3778**
Episodes of angina in past 24 hours, No. (%)												
0-2	2590 (56)	1295 (45)	974 (42)	817 (49)	409 (39)	352 (41)	768 (43)	387 (38)	246 (42)	4175 (51)	2091 (42)	1572 (42)
>2	139 (3)	124 (4)	174 (8)	19 (1)	28 (3)	18 (2)	41 (2)	28 (3)	27 (5)	199 (2)	180 (4)	219 (6)
Missing	1918 (41)	1485 (51)	1172 (51)	845 (50)	609 (58)	497 (57)	993 (55)	593 (59)	318 (54)	3756 (46)	2687 (54)	1987 (53)
Killip classification code, No. (%)												
I	2481 (53)	1125 (39)	1115 (48)	944 (56)	584 (56)	639 (74)	995 (55)	445 (44)	365 (62)	4420 (54)	2154 (43)	2119 (56)
II	912 (20)	515 (18)	275 (12)	334 (20)	175 (17)	65 (7)	307 (17)	215 (21)	68 (12)	1553 (19)	905 (18)	408 (11)
III	182 (4)	175 (6)	31 (1)	53 (3)	58 (6)	10 (1)	62 (3)	42 (4)	15 (3)	297 (4)	275 (6)	56 (1)
IV	251 (5)	77 (3)	13 (1)	99 (6)	24 (2)	7 (1)	143 (8)	29 (3)	1 (0)	493 (6)	130 (3)	21 (1)
Not stated/ inadequately described	821 (18)	1012 (35)	886 (38)	251 (15)	205 (20)	146 (17)	295 (16)	277 (27)	142 (24)	1367 (17)	1494 (30)	1174 (31)
Patients with any cardiac marker measurement done, No. (%)	4308 (93)	2770 (95)	2047 (88)	1582 (94)	1003 (96)	830 (96)	1649 (92)	980 (97)	552 (93)	7539 (93)	4753 (96)	3429 (91)
Peak CK-MB, Unit/L, No. (%)												
N	2282	2098	996	850	723	460	870	710	336	4002	3531	1792
>25 reference upper limits	1502 (66)	1176 (56)	0 (0)	511 (60)	386 (53)	0 (0)	463 (53)	403 (57)	0 (0)	2476 (62)	1965 (56)	0 (0)
Peak CK, Unit/L, No. (%)												
N	4051	2382	1859	1489	923	789	1546	877	486	7086	4182	3134
>2x reference upper limits	2936 (72)	914 (38)	0 (0)	1034 (69)	303 (33)	0 (0)	1118 (72)	275 (31)	0 (0)	5088 (72)	1492 (36)	0 (0)

Year	**2006-2008**			**2009**			**2010**			**2006-2010**		
ACS Stratum	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**
Total	**4647**	**2904**	**2320**	**1681**	**1046**	**867**	**1802**	**1008**	**591**	**8130**	**4958**	**3778**
Peak TnT, No. (%)												
N	558	1058	54	347	505	20	343	519	186	1248	2082	260
Positive or > reference upper limits	535 (96)	959 (91)	0 (0)	334 (96)	478 (95)	0 (0)	312 (91)	419 (81)	0 (0)	1181 (95)	1856 (89)	0 (0)
Peak TnI, No. (%)												
N	147	308	164	27	57	16	83	269	184	257	634	364
Positive or > reference upper limits	135 (92)	252 (82)	0 (0)	26 (96)	49 (86)	0 (0)	71 (86)	240 (89)	0 (0)	232 (90)	541 (85)	0 (0)
Total cholesterol, mmol/L												
N	3666	1936	1454	1320	661	657	1327	641	376	6313	3238	2487
Mean (SD)	5.44 (1.32)	5.17 (1.33)	5.08 (1.30)	5.49 (1.33)	5.28 (1.44)	5.11 (1.24)	5.45 (1.33)	5.16 (1.41)	4.88 (1.18)	5.45 (1.33)	5.19 (1.37)	5.06 (1.27)
Median (min, max)	5.30 (3.00, 14.70)	5.00 (3.00, 12.92)	4.90 (3.00, 16.10)	5.49 (3.00, 19.90)	5.10 (3.00, 13.50)	5.00 (3.00, 12.10)	5.40 (3.00, 16.23)	4.90 (3.00, 13.70)	4.70 (3.00, 10.00)	5.35 (3.00, 19.90)	5.00 (3.00, 13.70)	4.90 (3.00, 16.10)
IQR	1.70	1.83	1.78	1.72	1.60	1.60	1.70	1.90	1.60	1.70	1.75	1.70
HDL-C, mmol/L												
N	3561	1993	1483	1320	679	671	1311	668	386	6192	3340	2540
Mean (SD)	1.12 (.36)	1.12 (.37)	1.09 (.36)	1.09 (.33)	1.11 (.38)	1.08 (.33)	1.09 (.3)	1.09 (.31)	1.10 (.29)	1.11 (.34)	1.11 (.36)	1.09 (.34)
Median (min, max)	1.10 (.50, 4.94)	1.07 (.50, 4.40)	1.03 (.50, 4.50)	1.04 (.50, 4.60)	1.04 (.50, 4.30)	1.04 (.50, 4.32)	1.10 (.50, 3.68)	1.04 (.50, 2.40)	1.07 (.50, 2.32)	1.09 (.50, 4.94)	1.06 (.50, 4.40)	1.04 (.50, 4.50)
IQR	0.40	0.40	0.36	0.36	0.35	0.34	0.36	0.38	0.37	0.39	0.39	0.36

Year	2006-2008			2009			2010			2006-2010		
ACS Stratum	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**
Total	**4647**	**2904**	**2320**	**1681**	**1046**	**867**	**1802**	**1008**	**591**	**8130**	**4958**	**3778**
LDL-C, mmol/L												
N	3511	1964	1436	1324	682	676	1308	661	382	6143	3307	2494
Mean (SD)	3.47 (1.25)	3.16 (1.21)	3.08 (1.13)	3.56 (1.17)	3.32 (1.30)	3.23 (1.18)	3.53 (1.20)	3.22 (1.31)	2.94 (1.09)	3.51 (1.22)	3.20 (1.25)	3.10 (1.14)
Median (min, max)	3.40 (1.00, 14.60)	3.03 (1.00, 10.08)	2.98 (1.00, 8.90)	3.50 (1.00, 13.00)	3.19 (1.10, 10.84)	3.10 (1.13, 9.66)	3.43 (1.00, 11.50)	3.00 (1.00, 10.58)	2.73 (1.01, 8.30)	3.40 (1.00, 14.60)	3.08 (1.00, 10.84)	2.96 (1.00, 9.66)
IQR	1.6	1.66	1.54	1.55	1.62	1.67	1.57	1.72	1.5	1.55	1.65	1.57
Triglycerides, mmol/L												
N	3146	1671	1269	1133	583	599	1146	555	313	5425	2809	2181
Mean (SD)	2.05 (1.25)	2.06 (1.22)	2.20 (1.40)	1.91 (1.00)	1.91 (1.07)	1.86 (.92)	2.00 (1.24)	1.90 (1.17)	1.97 (1.07)	2.01 (1.20)	2.00 (1.18)	2.07 (1.25)
Median (min, max)	1.70 (1.00, 15.00)	1.70 (1.00, 12.90)	1.80 (1.00, 14.00)	1.62 (1.00, 12.20)	1.60 (1.00, 14.00)	1.60 (1.00, 9.01)	1.69 (1.00, 15.00)	1.57 (1.00, 12.92)	1.62 (1.00, 9.93)	1.70 (1.00, 15.00)	1.70 (1.00, 14.00)	1.70 (1.00, 14.00)
IQR	1.00	1.00	1.16	0.90	0.76	0.75	0.90	0.90	0.98	1.00	0.90	0.99
Left ventricular ejection fraction, %												
N	3010	1523	571	1166	593	342	1147	478	152	5323	2594	1065
Mean (SD)	46 (11)	47 (14)	50 (15)	46 (11)	47 (14)	53 (11)	45 (12)	46 (15)	52 (17)	46 (12)	47 (14)	51 (14)
Median (min, max)	45 (5, 80)	48 (9, 79)	52 (8, 80)	46 (5, 80)	49 (10, 79)	55 (10, 74)	45 (5, 80)	48 (5, 80)	55 (10, 79)	45 (5, 80)	48 (5, 80)	55 (8, 80)
IQR	13	21	20	15	18	10	14	22	25	13	21	19

Year	2006-2008			2009			2010			2006-2010		
ACS Stratum	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**
Total	**4647**	**2904**	**2320**	**1681**	**1046**	**867**	**1802**	**1008**	**591**	**8130**	**4958**	**3778**
ECG, No. (%)												
Inferior leads	2116 (46)			808 (48)			829 (46)			3753 (46)		
Anterior leads	2688 (58)			932 (55)			1017 (56)			4637 (57)		
Lateral leads	1084 (23)			408 (24)			376 (21)			1868 (23)		
True posterior	439 (9)			114 (7)			133 (7)			686 (8)		
Right ventricle	387 (8)			120 (7)			117 (6)			624 (8)		
None	24 (1)			18 (1)			12 (1)			54 (1)		
Not stated/ inadequately described	31 (1)			7 (0)			30 (2)			68 (1)		
Pain to needle time, min												
N	2340			738			883			3961		
Mean (SD)	744.6 (4549.0)			8689.1 (176441.0)			1631.6 (20665.0)			2422.5 (76879.0)		
Median (min, max)	251.2 (15.3, 88000.0)			231.6 (2.2, 4732800.0)			229.4 (15.3, 528100.0)			240.3 (2.2, 4732800.0)		
IQR	290.5			255.6			286.2			281.8		

***Cardiac marker is defined as any of the following baseline investigations: 1) Peak CK-MB, 2) Peak CK, 3) Peak TnT, 4) Peak TnI whereby status Not Done= "False" for all investigations*
Note: Not all participating centre performed Troponin T or Troponin I tests
Note: Percentage is to the nearest decimal point

Table 3.2 Cardiac presentation of patients with ACS by age group (years), NCVD-ACS Registry, 2006-2010

Year	2008			2009			2010			Overall		
ACS Stratum	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**
Total	**516**	**4793**	**4562**	**203**	**1707**	**1684**	**212**	**1691**	**1498**	**931**	**8193**	**7742**
ACS stratum, No. (%)												
STEMI	344 (67)	2556 (53)	1747 (38)	145 (71)	909 (53)	627 (37)	146 (69)	1007 (60)	649 (43)	635 (68)	4474 (55)	3021 (39)
NSTEMI	87 (17)	1200 (25)	1617 (35)	31 (15)	420 (25)	595 (35)	43 (20)	394 (23)	571 (38)	161 (17)	2014 (25)	2783 (36)
UA	85 (16)	1037 (22)	1198 (26)	27 (13)	378 (22)	462 (27)	23 (11)	290 (17)	278 (19)	135 (15)	1705 (21)	1938 (25)
Systolic blood pressure, mmHg												
N	506	4711	4471	201	1675	1656	208	1659	1477	915	8047	7602
Mean (SD)	134 (27)	138 (28)	142 (30)	130 (25)	138 (27)	140 (29)	132 (22)	136 (27)	140 (30)	133 (25)	137 (28)	141 (30)
Median (min, max)	130 (71, 225)	135 (60, 230)	140 (60, 230)	125 (80, 220)	135 (60, 226)	139 (60, 228)	132 (85, 220)	134 (60, 230)	140 (60, 230)	129 (71, 225)	135 (60, 230)	140 (60, 230)
IQR	35	37	41	32	35	39	29	33	40	32	35	40
Diastolic blood pressure, mmHg												
N	480	4585	4406	196	1632	1634	204	1609	1448	880	7828	7486
Mean (SD)	81 (17)	83 (16)	79 (17)	81 (16)	82 (16)	79 (16)	81 (15)	82 (16)	79 (17)	81 (16)	82 (16)	79 (16)
Median (min, max)	80 (38, 120)	82 (20, 120)	80 (19, 120)	81 (44, 117)	82 (24, 120)	78 (25, 120)	82 (22, 119)	82 (26, 120)	78 (29, 120)	80 (22, 120)	82 (20, 120)	79 (19, 120)
IQR	23	23	21	21	22	22	19	22	22	21	23	22
Pulse pressure, mmHg												
N	478	4558	4370	196	1621	1625	204	1604	1441	878	7785	7434
Mean (SD)	49 (15)	54 (18)	62 (22)	48 (15)	53 (18)	60 (21)	50 (16)	52 (17)	61 (21)	49 (15)	53 (18)	61 (21)
Median (min, max)	48 (2, 119)	50 (6, 144)	60 (2, 154)	46 (19, 119)	50 (6, 128)	58 (3, 146)	48 (20, 159)	50 (10, 116)	58 (5, 158)	47 (2, 159)	50 (6, 144)	59 (2, 158)
IQR	19	23	29	16	23	28	18	21	28	18	22	28

Year	2008			2009			2010			Overall		
ACS Stratum	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**
Total	**516**	**4793**	**4562**	**203**	**1707**	**1684**	**212**	**1691**	**1498**	**931**	**8193**	**7742**
Heart rate at presentation, beats/min												
N	506	4715	4466	201	1685	1659	209	1661	1476	916	8063	7599
Mean (SD)	83 (19)	83 (21)	85 (22)	83 (20)	83 (20)	84 (22)	85 (19)	82 (20)	86 (23)	83 (19)	83 (20)	85 (22)
Median (min, max)	81 (34, 161)	80 (30, 200)	82 (29, 184)	81 (46, 183)	81 (25, 189)	82 (30, 187)	83 (48, 136)	80 (25, 181)	83 (30, 180)	81 (34, 183)	80 (25, 200)	82 (29, 187)
IQR	23	26	30	26	25	28	26	26	31	25	27	29
Episodes of angina in past 24 hours, No. (%)												
0-2	296 (57)	2488 (52)	2075 (45)	86 (42)	799 (47)	693 (41)	86 (41)	728 (43)	587 (39)	468 (50)	4015 (49)	3355 (43)
>2	17 (3)	214 (4)	206 (5)	2 (1)	31 (2)	32 (2)	8 (4)	46 (3)	42 (3)	27 (3)	293 (4)	278 (4)
Missing	203 (39)	2091 (44)	2281 (50)	115 (57)	877 (51)	959 (57)	118 (56)	917 (54)	869 (58)	436 (47)	3885 (47)	4109 (53)
Killip classification code, No. (%)												
I	321 (62)	2531 (53)	1869 (41)	128 (63)	1086 (64)	953 (57)	130 (61)	946 (56)	729 (49)	579 (62)	4563 (56)	3551 (46)
II	53 (10)	703 (15)	946 (21)	24 (12)	246 (14)	304 (18)	23 (11)	251 (15)	316 (21)	100 (11)	1201 (15)	1565 (20)
III	5 (1)	149 (3)	234 (5)	0 (0)	44 (3)	77 (5)	4 (2)	55 (3)	60 (4)	9 (1)	248 (3)	371 (5)
IV	9 (2)	158 (3)	174 (4)	9 (4)	55 (3)	66 (4)	11 (5)	84 (5)	78 (5)	29 (3)	297 (4)	318 (4)
Not stated/ inadequately described	128 (25)	1252 (26)	1339 (29)	42 (21)	276 (16)	284 (17)	44 (21)	355 (21)	315 (21)	214 (23)	1884 (23)	1937 (25)
Patients with any cardiac marker measurement done, No. (%)	464 (90)	4469 (93)	4192 (92)	194 (96)	1621 (95)	1600 (95)	199 (94)	1575 (93)	1407 (94)	857 (92)	7667 (94)	7197 (93)
Peak CK-MB, Unit/L, No. (%)												
N	255	2594	2527	110	932	991	121	897	898	486	4425	4414
>25 reference upper limits	141 (55)	1265 (49)	1272 (50)	62 (56)	390 (42)	445 (45)	55 (45)	379 (42)	432 (48)	258 (53)	2036 (46)	2147 (49)

Year	2008			2009			2010			Overall		
ACS Stratum	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**
Total	**516**	**4793**	**4562**	**203**	**1707**	**1684**	**212**	**1691**	**1498**	**931**	**8193**	**7742**
Peak CK, Unit/L, No. (%)												
N	418	4097	3777	185	1528	1488	184	1439	1286	787	7066	6549
>2x reference upper limits	257 (61)	2110 (52)	1483 (39)	116 (63)	699 (46)	522 (35)	115 (63)	753 (52)	525 (41)	488 (62)	3563 (50)	2529 (39)
Peak TnT, No. (%)												
N	61	770	839	42	379	451	64	452	532	167	1601	1822
Positive or > reference upper limits	57 (93)	686 (89)	751 (90)	39 (93)	353 (93)	420 (93)	48 (75)	311 (69)	372 (70)	144 (86)	1350 (84)	1543 (85)
Peak TnI, No. (%)												
N	38	253	328	9	42	49	29	240	267	76	535	644
Positive or > reference upper limits	23 (61)	153 (60)	211 (64)	7 (78)	28 (67)	40 (82)	18 (62)	125 (52)	168 (63)	48 (63)	306 (57)	419 (65)
Total cholesterol, mmol/L												
N	410	3598	3048	162	1299	1177	152	1205	987	724	6103	5211
Mean (SD)	5.6 (1.6)	5.5 (1.3)	5.0 (1.2)	5.7 (1.4)	5.5 (1.4)	5.1 (1.2)	5.7 (1.6)	5.4 (1.3)	5 (1.3)	5.7 (1.6)	5.5 (1.3)	5.1 (1.3)
Median (min, max)	5.4 (3.0, 14.7)	5.4 (3.0, 16.1)	4.9 (3.0, 12.9)	5.7 (3.0, 10.9)	5.4 (3.0, 19.9)	5.0 (3.0, 12.6)	5.5 (3.0, 16.2)	5.3 (3.0, 15.0)	4.8 (3.0, 10.4)	5.5 (3.0, 16.2)	5.4 (3.0, 19.9)	4.9 (3, 12.9)
IQR	1.9	1.8	1.7	1.6	1.7	1.6	1.7	1.7	1.7	1.7	1.7	1.7
HDL-C, mmol/L												
N	403	3592	3042	153	1303	1214	150	1220	995	706	6116	5250
Mean (SD)	1.03 (.32)	1.08 (.35)	1.17 (.38)	1.02 (.26)	1.06 (.32)	1.14 (.37)	1.01 (.25)	1.06 (.28)	1.14 (.32)	1.03 (.3)	1.07 (.33)	1.16 (.37)
Median (min, max)	1.0 (.5, 3.50)	1.0 (.5, 4.94)	1.1 (.5, 4.50)	1.0 (.5, 2.16)	1.0 (.5, 4.30)	1.1 (.5, 4.60)	1.0 (.6, 1.90)	1.0 (.5, 3.68)	1.1 (.5, 3.04)	1.0 (.5, 3.50)	1.0 (.5, 4.94)	1.1 (.5, 4.60)
IQR	0.39	0.32	0.44	0.36	0.31	0.40	0.35	0.30	0.40	0.39	0.31	0.41

***Cardiac marker is defined as any of the following baseline investigations: 1) Peak CK-MB, 2) Peak CK, 3) Peak TnT, 4) Peak Tnl whereby status Not Done= "False" for all investigations*
Note: Not all participating centre performed Troponin T or Troponin I tests

Year	2008			2009			2010			Overall		
ACS Stratum	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**
Total	**516**	**4793**	**4562**	**203**	**1707**	**1684**	**212**	**1691**	**1498**	**931**	**8193**	**7742**
LDL-C, mmol/L												
N	399	3485	3027	155	1310	1217	151	1205	995	705	6001	5238
Mean (SD)	3.60 (1.41)	3.45 (1.24)	3.10 (1.15)	3.76 (1.25)	3.55 (1.26)	3.23 (1.13)	3.69 (1.33)	3.48 (1.23)	3.14 (1.19)	3.66 (1.36)	3.48 (1.24)	3.14 (1.16)
Median (min, max)	3.40 (1.00, 10.10)	3.40 (1.00, 14.60)	2.98 (1.00, 10.08)	3.60 (1.50, 9.10)	3.50 (1.00, 13.00)	3.12 (1.00, 10.00)	3.60 (1.00, 9.10)	3.40 (1.00, 11.50)	2.91 (1.00, 8.40)	3.50 (1.00, 10.10)	3.40 (1.00, 14.60)	3.00 (1.00, 10.10)
IQR	1.7	1.64	1.56	1.55	1.64	1.5	1.71	1.6	1.6	1.7	1.6	1.52
Triglycerides, mmol/L												
N	376	3260	2450	143	1177	995	124	1085	805	643	5523	4249
Mean (SD)	2.44 (1.48)	2.22 (1.39)	1.84 (1.02)	2.39 (1.49)	1.99 (1.08)	1.72 (0.74)	2.34 (1.88)	2.06 (1.24)	1.79 (0.95)	2.41 (1.56)	2.14 (1.30)	1.80 (0.95)
Median (min, max)	2.10 (1.00, 13.50)	1.80 (1.00, 15.00)	1.59 (1.00, 14.00)	1.90 (1.00, 9.67)	1.70 (1.00, 14.00)	1.50 (1.00, 8.53)	1.90 (1.00, 15.00)	1.70 (1.00, 14.20)	1.50 (1.00, 9.93)	2.00 (1.00, 15.00)	1.80 (1.00, 15.00)	1.53 (1.00, 14.00)
IQR	1.38	1.13	0.85	1.40	0.85	0.66	1.14	0.99	0.80	1.38	1.01	0.78
Left ventricular ejection fraction, %												
N	302	2579	2223	136	1013	952	128	882	767	566	4475	3941
Mean (SD)	48 (11)	47 (12)	46 (13)	49 (12)	48 (12)	47 (13)	47 (13)	46 (13)	45 (15)	48 (12)	47 (12)	46 (13)
Median (min, max)	49 (12, 75)	47 (5, 80)	45 (9, 80)	50 (15, 77)	50 (5, 80)	48 (10, 80)	47 (6, 79)	46 (5, 80)	45 (5, 80)	49 (6, 79)	48 (5, 80)	45 (5, 80)
IQR	15	15	18	14	15	17	16	15	21	16	15	19

Year	2008			2009			2010			Overall		
ACS Stratum	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**
Total	**516**	**4793**	**4562**	**203**	**1707**	**1684**	**212**	**1691**	**1498**	**931**	**8193**	**7742**
ECG, No. (%)												
Inferior leads	137 (27)	1174 (24)	805 (18)	72 (35)	424 (25)	312 (19)	69 (33)	474 (28)	286 (19)	278 (30)	2073 (25)	1402 (18)
Anterior leads	201 (39)	1495 (31)	992 (22)	80 (39)	506 (30)	346 (21)	82 (39)	558 (33)	377 (25)	363 (39)	2560 (31)	1714 (22)
Lateral leads	87 (17)	589 (12)	408 (9)	34 (17)	221 (13)	153 (9)	26 (12)	202 (12)	148 (10)	147 (16)	1012 (12)	709 (9)
True posterior	29 (6)	238 (5)	172 (4)	10 (5)	64 (4)	40 (2)	9 (4)	75 (4)	49 (3)	48 (5)	377 (5)	261 (3)
Right ventricle	22 (4)	225 (5)	140 (3)	7 (3)	77 (5)	36 (2)	10 (5)	68 (4)	39 (3)	39 (4)	370 (5)	215 (3)
None	1 (0)	11 (0)	12 (0)	3 (1)	9 (1)	6 (0)	3 (1)	4 (0)	5 (0)	7 (1)	24 (0)	23 (0)
Not stated/ inadequately described	2 (0)	14 (0)	15 (0)	0 (0)	3 (0)	4 (0)	2 (1)	14 (1)	14 (1)	4 (0)	31 (0)	33 (0)
Pain to needle time, min												
N	191	1358	791	66	432	240	73	511	299	330	2303	1328
Mean (SD)	841.2 (6160.0)	775.8 (4841.0)	667.7 (3447.0)	492.3 (628.0)	12661.2 (229050.0)	3793.4 (36296.0)	2901.2 (20605.0)	1988.4 (25947.0)	711.8 (2782.0)	1227.1 (10758.0)	3274.5 (100032.0)	1242 (15733.0)
Median (min, max)	244.7 (46.0, 85247.0)	237.0 (15.0, 88000.0)	275.3 (15.0, 87991.0)	250.1 (31.0, 2910.0)	214.1 (2.0, 4732800.0)	270.9 (9.0, 526110.0)	207.5 (44.0, 176161.0)	225 (15.0, 528100.0)	249 (15.0, 45229.0)	239.2 (31.0, 176161.0)	229.4 (2.0, 4732800.0)	270.9 (9.0, 526110.0)
IQR	262.1	286.2	299.3	312.4	228.3	274.2	240.3	275.3	338.6	275.3	266.5	305.8
Door to needle time, min												
N	191	1365	810	73	473	286	77	527	317	341	2366	1412
Mean (SD)	87.9 (144.6)	98.5 (154.0)	110.4 (169.5)	101.1 (207.4)	94.3 (175.7)	108.4 (196.4)	111.5 (220.2)	110.5 (210.7)	134.8 (226.5)	96.1 (178.1)	100.5 (172.6)	115.3 (189.3)
Median (min, max)	52 (1, 1365)	50 (1, 1435)	60 (3, 1440)	40 (5, 1440)	40 (2, 1420)	50 (4, 1420)	30 (4, 1285)	44 (3, 1440)	55 (5, 1410)	45 (1, 1440)	48 1, 1440)	58 (3, 1440)
IQR	60	76	85	62	68	75	62	66	90	65	72	82

**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

Table 3.3 Cardiac presentation of patients with ACS by gender, NCVD-ACS Registry, 2006-2010

Year	**2006-2008**		**2009**		**2010**		**2006-2010**	
Gender	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Total	**7476**	**2395**	**2726**	**868**	**2621**	**780**	**12823**	**4043**
ACS stratum, No. (%)								
STEMI	3943 (53)	704 (29)	1452 (53)	229 (26)	1546 (59)	256 (33)	6941 (54)	1189 (29)
NSTEMI	2011 (27)	893 (37)	740 (27)	306 (35)	700 (27)	308 (39)	3451 (27)	1507 (37)
UA	1522 (20)	798 (33)	534 (20)	333 (38)	375 (14)	216 (28)	2431 (19)	1347 (33)
Systolic blood pressure, mmHg								
N	7330	2358	2681	851	2580	764	12591	3973
Mean (SD)	138 (28)	146 (31)	136 (27)	145 (29)	136 (27)	145 (31)	137 (28)	145 (30)
Median (min, max)	135 (60, 230)	143 (60, 230)	134 (60, 228)	143 (63, 228)	134 (60, 230)	143 (60, 229)	135 (60, 230)	143 (60, 230)
IQR	38	41	35	40	34	40	36	41
Diastolic blood pressure, mmHg								
N	7147	2324	2627	835	2512	749	12286	3908
Mean (SD)	81 (16)	80 (16)	81 (16)	80 (16)	81 (16)	79 (17)	81 (16)	80 (16)
Median (min, max)	81 (22, 120)	80 (19, 120)	80 (24, 120)	80 (40, 120)	81 (22, 120)	79 (26, 120)	80 (22, 120)	80 (19, 120)
IQR	23	20	22	21	21	22	22	21
Pulse pressure, mmHg								
N	7104	2302	2611	831	2507	742	12222	3875
Mean (SD)	55 (18)	65 (23)	54 (18)	64 (22)	53 (18)	64 (22)	54 (18)	65 (22)
Median (min, max)	52 (2, 154)	62 (10, 145)	51 (3, 146)	61 (11, 137)	51 (5, 159)	62 (7, 158)	51 (2, 159)	62 (7, 158)
IQR	24	31	23	30	22	31	23	31

Year	2006-2008		2009		2010		2006-2010	
Gender	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Total	**7476**	**2395**	**2726**	**868**	**2621**	**780**	**12823**	**4043**
Heart rate at presentation, beats/min								
N	7334	2353	2694	851	2576	770	12604	3974
Mean (SD)	82 (21)	88 (21)	83 (20)	87 (21)	83 (21)	87 (23)	82 (21)	88 (22)
Median (min, max)	80 (30, 200)	85 (29, 184)	80 (25, 189)	86 (30, 180)	80 (25, 181)	85 (26, 180)	80 (25, 200)	85 (26, 184)
IQR	27	29	27	28	27	29	27	28
Episodes of angina in past 24 hours, No. (%)								
0-2	3823 (51)	1036 (43)	1212 (44)	366 (42)	1092 (42)	309 (40)	6127 (48)	1711 (42)
>2	329 (4)	108 (5)	50 (2)	15 (2)	80 (3)	16 (2)	459 (4)	139 (3)
Missing	3324 (44)	1251 (52)	1464 (54)	487 (56)	1449 (55)	455 (58)	6237 (49)	2193 (54)
Killip classification code, No. (%)								
I	3736 (50)	985 (41)	1646 (60)	521 (60)	1414 (54)	391 (50)	6796 (53)	1897 (47)
II	1248 (17)	454 (19)	446 (16)	128 (15)	450 (17)	140 (18)	2144 (17)	722 (18)
III	271 (4)	117 (5)	81 (3)	40 (5)	83 (3)	36 (5)	435 (3)	193 (5)
IV	263 (4)	78 (3)	112 (4)	18 (2)	136 (5)	37 (5)	511 (4)	133 (3)
Not stated/ inadequately described	1958 (26)	761 (32)	441 (16)	161 (19)	538 (21)	176 (23)	2937 (23)	1098 (27)
Patients with any cardiac marker measurement done, No. (%)	6931 (93)	2194 (92)	2588 (95)	827 (95)	2451 (94)	730 (94)	11970 (93)	3751 (93)
Peak CK-MB, Unit/L, No. (%)								
N	3998	1378	1529	504	1442	474	6969	2356
>25 reference upper limits	2103 (53)	575 (42)	713 (47)	184 (37)	661 (46)	205 (43)	3477 (50)	964 (41)

Year	**2006-2008**		**2009**		**2010**		**2006-2010**	
Gender	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Total	**7476**	**2395**	**2726**	**868**	**2621**	**780**	**12823**	**4043**
Peak CK, Unit/L, No. (%)								
N	6403	1889	2437	764	2250	659	11090	3312
>2x reference upper limits	3250 (51)	600 (32)	1141 (47)	196 (26)	1186 (53)	207 (31)	5577 (50)	1003 (30)
Peak TnT, No. (%)								
N	1245	425	642	230	786	262	2673	917
Positive or > reference upper limits	1129 (91)	365 (86)	604 (94)	208 (90)	570 (73)	161 (61)	2303 (86)	734 (80)
Peak TnI, No. (%)								
N	378	241	54	46	345	191	777	478
Positive or > reference upper limits	246 (65)	141 (59)	42 (78)	33 (72)	203 (59)	108 (57)	491 (63)	282 (59)
Total cholesterol, mmol/L								
N	5476	1580	2034	604	1853	491	9363	2675
Mean (SD)	5.3 (1.3)	5.3 (1.4)	5.3 (1.4)	5.3 (1.3)	5.3 (1.3)	5.3 (1.4)	5.3 (1.3)	5.3 (1.4)
Median (min, max)	5.2 (3.0, 16.1)	5.2 (3.0, 12.9)	5.2 (3.0, 19.9)	5.2 (3.0, 12.1)	5.2 (3.0, 16.2)	5 (3.0, 15.0)	5.2 (3.0, 19.9)	5.2 (3.0, 15.0)
IQR	1.7	1.8	1.7	1.7	1.7	1.8	1.7	1.8
HDL-C, mmol/L								
N	5449	1588	2062	608	1865	500	9376	2696
Mean (SD)	1.09 (.36)	1.20 (.38)	1.07 (.34)	1.18 (.36)	1.07 (.28)	1.18 (.33)	1.08 (.34)	1.19 (.37)
Median (min, max)	1.02 (.5, 4.94)	1.14 (.5, 4.24)	1.00 (.5, 4.60)	1.18 (.5, 4.20)	1.01 (.5, 3.68)	1.17 (.5, 2.50)	1.01 (.5, 4.94)	1.15 (.5, 4.24)
IQR	0.33	0.44	0.31	0.44	0.30	0.46	0.32	0.45

Year	2006-2008		2009		2010		2006-2010	
Gender	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Total	**7476**	**2395**	**2726**	**868**	**2621**	**780**	**12823**	**4043**
LDL-C, mmol/L								
N	5341	1570	2065	617	1856	495	9262	2682
Mean (SD)	3.31 (1.21)	3.27 (1.28)	3.44 (1.22)	3.36 (1.21)	3.38 (1.21)	3.23 (1.32)	3.35 (1.21)	3.28 (1.27)
Median (min, max)	3.20 (1.00, 14.60)	3.10 (1.00, 10.08)	3.37 (1.00, 13.00)	3.22 (1.10, 9.48)	3.28 (1.00, 10.58)	3.00 (1.10, 11.50)	3.28 (1.00, 14.60)	3.10 (1.00, 11.50)
IQR	1.62	1.63	1.61	1.68	1.55	1.84	1.60	1.67
Triglycerides, mmol/L								
N	4723	1363	1792	523	1595	419	8110	2305
Mean (SD)	2.10 (1.30)	2.02 (1.18)	1.91 (1.04)	1.85 (.85)	1.98 (1.17)	1.92 (1.29)	2.04 (1.23)	1.96 (1.14)
Median (min, max)	1.70 (1.00, 15.00)	1.70 (1.00, 14.00)	1.61 (1.00, 14.00)	1.60 (1.00, 8.00)	1.65 (1.00, 15.00)	1.60 (1.00, 14.20)	1.70 (1.00, 15.00)	1.62 (1.00, 14.20)
IQR	1.10	1.00	0.86	0.70	0.90	0.85	1.00	0.90
Left ventricular ejection fraction, %								
N	4036	1068	1657	444	1418	359	7111	1871
Mean (SD)	46 (12)	48 (13)	47 (12)	49 (12)	45 (13)	48 (15)	46 (13)	48 (14)
Median (min, max)	46 (5, 80)	48 (10, 80)	49 (5, 80)	50 (10, 80)	45 (5, 79)	49 (5, 80)	46 (5, 80)	50 (5, 80)
IQR	16	18	15	16	17	23	16	18
Pain to needle time, min								
N	2020	320	654	84	772	111	3446	515
Mean (SD)	758.1 (4848.0)	659.3 (1719.0)	9442.7 (187299.0)	2821.6 (19871.0)	1724.6 (22034.0)	984.9 (4556.0)	2622.8 (82359.0)	1082.1 (8405.3)
Median (min, max)	240.3 (15.0, 878000.0)	314.6 (15.0, 20487.0)	229.4 (2.0, 4732800.0)	278.5 (20.0, 182520.0)	225.0 (15.0, 528100.0)	260.0 (59.0, 45229.0)	238.1 (2.0, 4732800.0)	294.9 (15.3, 182520.0)
IQR	276.3	339.7	251.2	402.0	288.4	277.4	275.3	345.2

Year	**2006-2008**		**2009**		**2010**		**2006-2010**	
Gender	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Total	**7476**	**2395**	**2726**	**868**	**2621**	**780**	**12823**	**4043**
Door to needle time, min								
N	2038	328	728	104	798	123	3564	555
Mean (SD)	98.6 (155.1)	121.0 (179.8)	98.0 (185.9)	112.3 (185.6)	113.9 (210.0)	151.5 (257.0)	101.9 (175.2)	126.2 (200.6)
Median (min, max)	51 (1, 1435)	67.5 (3, 1440)	42 (2, 1440)	58.5 (2, 1420)	45 (3, 1410)	60 (5, 1440)	49 (1, 1440)	60 (2, 1440)
IQR	72.0	92.0	67.0	65.5	69.0	90.0	74.0	88.0

Cardiac marker is defined as any of the following baseline investigations: 1) Peak CK-MB, 2) Peak CK, 3) Peak TnT, 4) Peak Tnl whereby status Not Done="False" for all investigations
Note: Not all participating centre performed Troponin T or Troponin I tests

Table 3.4 Cardiac presentation of patients with ACS by pre-morbid diabetes, NCVD-ACS Registry, 2006-2010

Year	2006-2008			2009			2010			2006-2010		
Diabetes status	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**
Total	**4173**	**3945**	**1753**	**1564**	**1571**	**459**	**1508**	**1434**	**459**	**7245**	**6950**	**2671**
ACS stratum, No. (%)												
STEMI	1646 (39)	1975 (50)	1026 (59)	623 (40)	804 (51)	254 (55)	700 (46)	795 (55)	307 (67)	2969 (41)	3574 (51)	1587 (59)
NSTEMI	1427 (34)	1071 (27)	406 (23)	517 (33)	412 (26)	117 (25)	519 (34)	390 (27)	99 (22)	2463 (34)	1873 (27)	622 (23)
UA	1100 (26)	899 (23)	321 (18)	424 (27)	355 (23)	88 (19)	289 (19)	249 (17)	53 (12)	1813 (25)	1503 (22)	462 (17)
Systolic blood pressure, mmHg												
N	4099	3891	1698	1534	1550	448	1486	1410	448	7119	6851	2594
Mean (SD)	142 (30)	139 (29)	136 (27)	141 (28)	137 (27)	136 (29)	140 (29)	137 (27)	134 (27)	141 (29)	138 (28)	135 (28)
Median (min, max)	140 (60, 230)	136 (60, 230)	133 (64, 228)	140 (60, 228)	134 (60, 228)	130 (69, 228)	139 (60, 230)	135 (60, 229)	132 (65, 220)	140 (60, 230)	135 (60, 230)	132 (64, 228)
IQR	41	38	36	38	34	38	39	35	32	40	36	36
Diastolic blood pressure, mmHg												
N	4033	3775	1663	1507	1518	437	1458	1363	440	6998	6656	2540
Mean (SD)	81 (16)	81 (17)	80 (17)	81 (16)	81 (16)	80 (17)	81 (16)	81 (16)	80 (16)	81 (16)	81 (16)	80 (17)
Median (min, max)	80 (19, 120)	80 (22, 120)	80 (20, 120)	80 (25, 120)	80 (24, 120)	79 (34, 120)	80 (29, 120)	80 (22, 120)	80 (26, 120)	80 (19, 120)	80 (22, 120)	80 (20, 120)
IQR	22	22	22	22	21	22	21	21	21	22	22	22
Pulse pressure, mmHg												
N	3993	3758	1655	1498	1509	435	1450	1360	439	6941	6627	2529
Mean (SD)	60 (21)	56 (19)	54 (18)	59 (21)	55 (19)	54 (20)	58 (21)	54 (18)	54 (18)	59 (21)	55 (19)	54 (18)
Median (min, max)	58 (2, 145)	52 (2, 154)	51 (6, 137)	56 (6, 146)	52 (3, 130)	50 (11, 126)	56 (7, 158)	51 (5, 159)	51 (12, 119)	57 (2, 158)	52 (2, 159)	51 (6, 137)
IQR	29	24	23	26	23	24	26	23	23	28	23	24

Year	2006-2008			2009			2010			2006-2010		
Diabetes status	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**
Total	**4173**	**3945**	**1753**	**1564**	**1571**	**459**	**1508**	**1434**	**459**	**7245**	**6950**	**2671**
Heart rate at presentation, beats/min												
N	4105	3894	1688	1543	1553	449	1487	1413	446	7135	6860	2583
Mean (SD)	87 (21)	81 (21)	82 (22)	87 (21)	82 (20)	82 (21)	87 (22)	81 (21)	81 (22)	87 (21)	81 (21)	82 (22)
Median (min, max)	85 (29, 191)	78 (30, 200)	80 (30, 180)	84 (30, 187)	80 (25, 189)	80 (36, 181)	85 (25, 180)	79 (30, 181)	79 (26, 177)	85 (25, 191)	79 (25, 200)	80 (26, 181)
IQR	28	26	27	27	26	26	29	26	30	28	27	28
Episodes of angina in past 24 hours, No. (%)												
0-2	2023 (48)	2015 (51)	821 (47)	617 (39)	762 (49)	199 (43)	568 (38)	678 (47)	155 (34)	3208 (44)	3455 (50)	1175 (44)
>2	199 (5)	165 (4)	73 (4)	33 (2)	27 (2)	5 (1)	40 (3)	51 (4)	5 (1)	272 (4)	243 (3)	83 (3)
Missing	1951 (47)	1765 (45)	859 (49)	914 (58)	782 (50)	255 (56)	900 (60)	705 (49)	299 (65)	3765 (52)	3252 (47)	1413 (53)
Killip classification code, No. (%)												
I	1909 (46)	2037 (52)	775 (44)	909 (58)	989 (63)	269 (59)	726 (48)	839 (59)	240 (52)	3544 (49)	3865 (56)	1284 (48)
II	784 (19)	649 (16)	269 (15)	277 (18)	234 (15)	63 (14)	336 (22)	202 (14)	52 (11)	1397 (19)	1085 (16)	384 (14)
III	215 (5)	112 (3)	61 (3)	74 (5)	31 (2)	16 (3)	65 (4)	38 (3)	16 (3)	354 (5)	181 (3)	93 (3)
IV	158 (4)	107 (3)	76 (4)	63 (4)	46 (3)	21 (5)	75 (5)	71 (5)	27 (6)	296 (4)	224 (3)	124 (5)
Not stated/ inadequately described	1107 (27)	1040 (26)	572 (33)	241 (15)	271 (17)	90 (20)	306 (20)	284 (20)	124 (27)	1654 (23)	1595 (23)	786 (29)
Patients with any cardiac marker measurement done, No. (%)	3948 (95)	3718 (94)	1459 (83)	1477 (94)	1512 (96)	426 (93)	1408 (93)	1352 (94)	421 (92)	6833 (94)	6582 (95)	2306 (86)

Year	2006-2008			2009			2010			2006-2010		
Diabetes status	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**
Total	**4173**	**3945**	**1753**	**1564**	**1571**	**459**	**1508**	**1434**	**459**	**7245**	**6950**	**2671**
Peak CK-MB, Unit/L, No. (%)												
N	2429	2177	770	873	903	257	888	806	222	4190	3886	1249
>25 reference upper limits	1111 (46)	1115 (51)	452 (59)	368 (42)	411 (46)	118 (46)	383 (43)	381 (47)	102 (46)	1862 (44)	1907 (49)	672 (54)
Peak CK, Unit/L, No. (%)												
N	3605	3359	1328	1397	1407	397	1300	1237	372	6302	6003	2097
>2x reference upper limits	1413 (39)	1658 (49)	779 (59)	491 (35)	658 (47)	188 (47)	549 (42)	628 (51)	216 (58)	2453 (39)	2944 (49)	1183 (56)
Peak TnT, No. (%)												
N	819	641	210	457	327	88	535	444	69	1811	1412	367
Positive or > reference upper limits	721 (88)	580 (90)	193 (92)	412 (90)	314 (96)	86 (98)	365 (68)	308 (69)	58 (84)	1498 (83)	1202 (85)	337 (92)
Peak TnI, No. (%)												
N	291	215	113	37	46	17	281	226	29	609	487	159
Positive or > reference upper limits	190 (65)	118 (55)	79 (70)	22 (59)	38 (83)	15 (88)	165 (59)	127 (56)	19 (66)	377 (62)	283 (58)	113 (71)
Total cholesterol, mmol/L												
N	2958	2937	1161	1098	1200	340	992	1030	322	5048	5167	1823
Mean (SD)	5.2 (1.3)	5.3 (1.3)	5.5 (1.3)	5.2 (1.4)	5.5 (1.3)	5.4 (1.2)	5.2 (1.4)	5.4 (1.3)	5.3 (1.3)	5.2 (1.4)	5.4 (1.3)	5.4 (1.3)
Median (min, max)	5.0 (3.0, 16.1)	5.2 (3.0, 14.3)	5.4 (3.0, 14.7)	5.0 (3.0, 19.9)	5.4 (3.0, 14.9)	5.3 (3.0, 12.6)	4.9 (3.0, 16.2)	5.3 (3.0, 15.0)	5.3 (3.0, 10.3)	5.0 (3.0, 19.9)	5.3 (3.0, 15.0)	5.3 (3.0, 14.7)
IQR	1.8	1.7	1.7	1.7	1.7	1.6	1.8	1.6	1.8	1.8	1.7	1.6

Year	2006-2008			2009			2010			2006-2010		
Diabetes status	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**
Total	**4173**	**3945**	**1753**	**1564**	**1571**	**459**	**1508**	**1434**	**459**	**7245**	**6950**	**2671**
HDL-C, mmol/L												
N	3005	2877	1155	1128	1205	337	1009	1041	315	5142	5123	1807
Mean (SD)	1.10 (.38)	1.13 (.36)	1.13 (.34)	1.07 (.32)	1.11 (.35)	1.11 (.41)	1.06 (.29)	1.11 (.30)	1.11 (.31)	1.09 (.35)	1.12 (.35)	1.13 (.35)
Median (min, max)	1.0 (.5, 4.90)	1.1 (.5, 4.94)	1.1 (.5, 4.20)	1.0 (.5, 4.20)	1.1 (.5, 4.32)	1.0 (.5, 4.60)	1.0 (.5, 3.04)	1.1 (.5, 3.68)	1.1 (.5, 2.50)	1.0 (.5, 4.90)	1.1 (.5, 4.94)	1.1 (.5, 4.60)
IQR	0.37	0.40	0.40	0.32	0.40	0.35	0.35	0.40	0.40	0.36	0.40	0.40
LDL-C, mmol/L												
N	2914	2847	1150	1128	1219	335	995	1038	318	5037	5104	1803
Mean (SD)	3.14 (1.23)	3.37 (1.21)	3.54 (1.20)	3.20 (1.20)	3.58 (1.23)	3.56 (1.13)	3.20 (1.25)	3.47 (1.23)	3.39 (1.17)	3.17 (1.23)	3.44 (1.22)	3.52 (1.18)
Median (min, max)	3.00 (1.0, 14.6)	3.30 (1.0, 10.1)	3.45 (1.0, 8.2)	3.10 (1.1, 10.8)	3.55 (1.0, 13.0)	3.41 (1.2, 7.4)	3.00 (1.0, 10.6)	3.40 (1.0, 11.5)	3.30 (1.0, 8.3)	3.00 (1.0, 14.6)	3.40 (1.0, 13.0)	3.40 (1.0, 8.3)
IQR	1.66	1.60	1.53	1.55	1.67	1.50	1.65	1.60	1.50	1.60	1.63	1.50
Triglycerides, mmol/L												
N	2645	2476	965	992	1050	273	886	866	262	4523	4392	1500
Mean (SD)	2.21 (1.38)	1.98 (1.13)	2.00 (1.30)	1.98 (1.01)	1.83 (1.01)	1.85 (.90)	2.08 (1.29)	1.85 (1.02)	1.98 (1.37)	2.13 (1.30)	1.92 (1.08)	1.97 (1.25)
Median (min, max)	1.80 (1.0, 14.0)	1.67 (1.0, 15.0)	1.64 (1.0, 13.7)	1.70 (1.0, 8.6)	1.60 (1.0, 14.0)	1.60 (1.0, 8.5)	1.70 (1.0, 12.9)	1.58 (1.0, 14.2)	1.60 (1.0, 15.0)	1.76 (1.0, 14.0)	1.60 (1.0, 15.0)	1.60 (1.0, 15.0)
IQR	1.10	0.92	1.00	0.98	0.70	0.82	0.99	0.90	0.92	1.05	0.87	0.95

Year	2006-2008			2009			2010			2006-2010		
Diabetes status	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**
Total	**4173**	**3945**	**1753**	**1564**	**1571**	**459**	**1508**	**1434**	**459**	**7245**	**6950**	**2671**
Left ventricular ejection fraction, %												
N	2128	2115	861	895	969	237	805	724	248	3828	3808	1346
Mean (SD)	46 (13)	48 (12)	46 (13)	45 (13)	49 (12)	49 (12)	45 (14)	47 (13)	47 (13)	45 (13)	48 (12)	47 (13)
Median (min, max)	45 (8, 80)	48 (5, 80)	46 (10, 78)	45 (10, 77)	50 (5, 80)	50 (13, 80)	45 (5, 80)	46 (13, 79)	47 (5, 78)	45 (5, 80)	49 (5, 80)	47 (5, 80)
IQR	18	15	16	19	13	16	20	17	15	19	15	15
ECG, No. (%)												
Inferior leads	731 (18)	946 (24)	439 (25)	288 (18)	403 (26)	117 (25)	325 (22)	353 (25)	151 (33)	1344 (19)	1702 (24)	707 (26)
Anterior leads	964 (23)	1143 (29)	581 (33)	349 (22)	439 (28)	144 (31)	389 (26)	470 (33)	158 (34)	1702 (23)	2052 (30)	883 (33)
Lateral leads	368 (9)	471 (12)	245 (14)	158 (10)	214 (14)	36 (8)	141 (9)	188 (13)	47 (10)	667 (9)	873 (13)	328 (12)
True posterior	128 (3)	198 (5)	113 (6)	28 (2)	66 (4)	20 (4)	42 (3)	58 (4)	33 (7)	198 (3)	322 (5)	166 (6)
Right ventricle	116 (3)	181 (5)	90 (5)	36 (2)	61 (4)	23 (5)	39 (3)	55 (4)	23 (5)	191 (3)	297 (4)	136 (5)
None	7 (0)	8 (0)	9 (1)	6 (0)	8 (1)	4 (1)	5 (0)	6 (0)	1 (0)	18 (0)	22 (0)	14 (1)
Not stated/ inadequately described	16 (0)	14 (0)	1 (0)	3 (0)	1 (0)	3 (1)	12 (1)	12 (1)	6 (1)	31 (0)	27 (0)	10 (0)
Pain to needle time, min												
N	809	1021	510	247	369	122	313	409	161	1369	1799	793
Mean (SD)	901.0 (5504)	541.6 (3090)	902.7 (5266)	3667.4 (35939)	1990.2 (27467)	39117.3 (428458)	1122.1 (10007)	2517.9 (29067)	370.7 (540)	1450.7 (16555)	1288.0 (18770)	6673.9 (168095)
Median (min, max)	281.8 (15.3, 87995)	240.3 (15.3, 85247)	235.9 (19.7, 88000)	260 (6.6, 528731)	233.7 (2.2, 526110)	205.3 (19.7, 4732800)	249 (15.3, 176161)	214.1 (28.4, 528100)	225 (19.7, 4548)	270.9 (6.6, 528731)	231.6 (2.2, 528100)	225 (19.7, 4732800)
IQR	336.4	270.9	260.0	318.9	242.5	203.2	358.3	266.5	249.0	340.8	260.0	255.6

Year	2006-2008			2009			2010			2006-2010		
Diabetes status	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**	**Diabetic**	**Non-diabetic**	**Unknown**
Total	**4173**	**3945**	**1753**	**1564**	**1571**	**459**	**1508**	**1434**	**459**	**7245**	**6950**	**2671**
Door to needle time, min												
N	804	1034	528	278	417	137	342	408	171	1424	1859	836
Mean (SD)	109.1 (159.6)	91.6 (131.0)	110.4 (201.1)	113.9 (199.8)	95.1 (181.5)	85.2 (168.0)	133.0 (237.1)	101.8 (192.0)	131.8 (229.9)	115.8 (189.0)	94.6 (158.1)	110.7 (202.7)
Median (min, max)	60.0 (4, 1423)	50.0 (1, 1349)	48.5 (1, 1440)	51.5 (2, 1350)	45.0 (3, 1440)	35.0 (3, 1395)	51.5 (4, 1400)	40.5 (4, 1440)	50.0 (3, 1410)	58.0 (2, 1423)	47.0 (1, 1440)	45.0 (1, 1440)
IQR	81.0	70.0	75.5	85.0	60.0	65.0	95.0	54.5	85.0	85.0	65.0	75.0

**Cardiac marker is defined as any of the following baseline investigations: 1) Peak CK-MB, 2) Peak CK, 3) Peak TnT, 4) Peak Tnl whereby status Not Done="False" for all investigations*
Note: Not all participating centre performed Troponin T or Troponin I tests
Note: Percentage is to the nearest decimal point

Table 3.5 Cardiac presentation of patients with ACS by pre-morbid hypertension, NCVD-ACS Registry, 2006-2010

Year	2006-2008			2009			2010			2006-2010		
Hypertension	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**
Total	**5933**	**2479**	**1459**	**2302**	**954**	**338**	**2081**	**962**	**358**	**10316**	**4395**	**2155**
ACS stratum, No. (%)												
STEMI	2247 (38)	1504 (61)	896 (61)	854 (37)	606 (64)	221 (65)	881 (42)	659 (69)	262 (73)	3982 (39)	2769 (63)	1379 (64)
NSTEMI	1994 (34)	588 (24)	322 (22)	763 (33)	207 (22)	73 (22)	720 (35)	184 (19)	67 (19)	3505 (34)	988 (22)	465 (22)
UA	1692 (29)	387 (16)	241 (17)	685 (30)	141 (15)	44 (13)	480 (23)	119 (12)	29 (8)	2829 (27)	638 (15)	311 (14)
Systolic blood pressure, mmHg												
N	5826	2449	1413	2259	945	328	2048	946	350	10133	4340	2091
Mean (SD)	145 (30)	132 (26)	132 (26)	142 (28)	131 (25)	131 (28)	143 (29)	130 (25)	130 (26)	144 (29)	131 (26)	132 (26)
Median (min, max)	142 (60, 230)	130 (60, 230)	130 (64, 228)	141 (60, 228)	128 (63, 219)	127 (69, 228)	141 (60, 230)	129 (60, 219)	130 (68, 218)	142 (60, 230)	130 (60, 230)	130 (64, 228)
IQR	40	34	34	37	32	36	37	33	33	39	33	34
Diastolic blood pressure, mmHg												
N	5664	2410	1397	2211	931	320	1985	930	346	9860	4271	2063
Mean (SD)	83 (16)	79 (16)	79 (17)	82 (16)	79 (15)	78 (16)	82 (16)	78 (16)	79 (16)	82 (16)	79 (16)	79 (16)
Median (min, max)	82 (22, 120)	79 (19, 120)	79 (20, 120)	81 (30, 120)	79 (24, 120)	78 (37, 118)	82 (29, 120)	79 (22, 120)	79 (26, 119)	82 (22, 120)	79 (19, 120)	79 (20, 120)
IQR	23	21	22	23	21	21	23	21	20	24	22	22

Year	2006-2008			2009			2010			2006-2010		
Hypertension	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**
Total	**5933**	**2479**	**1459**	**2302**	**954**	**338**	**2081**	**962**	**358**	**10316**	**4395**	**2155**
Pulse pressure, mmHg												
N	5615	2402	1389	2196	927	319	1976	928	345	9787	4257	2053
Mean (SD)	61 (21)	52 (17)	53 (17)	59 (21)	51 (17)	51 (17)	59 (20)	51 (17)	51 (17)	60 (21)	52 (17)	52 (17)
Median (min, max)	58 (6, 154)	50 (2, 138)	50 (6, 135)	57 (3, 146)	48 (13, 119)	49 (11, 112)	56 (7, 158)	49 (5, 159)	49 (12, 119)	58 (3, 158)	49 (2, 159)	50 (6, 135)
IQR	28	21	22	27	22	22	25	20	20	27	20	21
Heart rate at presentation, beats/min												
N	5834	2446	1407	2277	939	329	2050	946	350	10161	4331	2086
Mean (SD)	85 (21)	82 (21)	82 (22)	85 (21)	83 (21)	81 (20)	85 (22)	82 (21)	82 (23)	85 (21)	82 (21)	82 (22)
Median (min, max)	82 (29, 192)	80 (30, 200)	80 (30, 180)	82 (30, 187)	80 (25, 189)	80 (36, 180)	82 (25, 180)	80 (38, 181)	79 (26, 177)	82 (25, 192)	80 (25, 200)	80 (26, 180)
IQR	28	26	27	27	28	25	29	26	31	28	26	28
Episodes of angina in past 24 hours, No. (%)												
0-2	2891 (49)	1283 (52)	685 (47)	947 (41)	480 (50)	151 (45)	806 (39)	473 (49)	122 (34)	4644 (45)	2236 (51)	958 (44)
>2	304 (5)	79 (3)	54 (4)	47 (2)	14 (1)	4 (1)	55 (3)	37 (4)	4 (1)	406 (4)	130 (3)	62 (3)
Missing	2738 (46)	1117 (45)	720 (49)	1308 (57)	460 (48)	183 (54)	1220 (59)	452 (47)	232 (65)	5266 (51)	2029 (46)	1135 (53)

Year	2006-2008			2009			2010			2006-2010		
Hypertension	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**
Total	**5933**	**2479**	**1459**	**2302**	**954**	**338**	**2081**	**962**	**358**	**10316**	**4395**	**2155**
Killip classification code, No. (%)												
I	2740 (46)	1352 (55)	629 (43)	1389 (60)	596 (62)	182 (54)	1045 (50)	574 (60)	186 (52)	5174 (50)	2522 (57)	997 (46)
II	1088 (18)	380 (15)	234 (16)	362 (16)	162 (17)	50 (15)	396 (19)	155 (16)	39 (11)	1846 (18)	697 (16)	323 (15)
III	266 (4)	70 (3)	52 (4)	93 (4)	17 (2)	11 (3)	86 (4)	22 (2)	11 (3)	445 (4)	109 (2)	74 (3)
IV	170 (3)	94 (4)	77 (5)	68 (3)	42 (4)	20 (6)	91 (4)	53 (6)	29 (8)	329 (3)	189 (4)	126 (6)
Not stated/ inadequately described	1669 (28)	583 (24)	467 (32)	390 (17)	137 (14)	75 (22)	463 (22)	158 (16)	93 (26)	2522 (24)	878 (20)	635 (29)
Patients with any cardiac marker measurement done, No. (%)	5574 (94)	2357 (95)	1194 (82)	2193 (95)	915 (96)	307 (91)	1949 (94)	902 (94)	330 (92)	9716 (94)	4174 (95)	1831 (85)
Peak CK-MB, Unit/L, No. (%)												
N	3375	1338	663	1343	524	166	1244	498	174	5962	2360	1003
>25 reference upper limits	1561 (46)	727 (54)	390 (59)	583 (43)	227 (43)	87 (52)	569 (46)	228 (46)	69 (40)	2713 (46)	1182 (50)	546 (54)
Peak CK, Unit/L, No. (%)												
N	5053	2158	1081	2047	870	284	1778	845	286	8878	3873	1651
>2x reference upper limits	1929 (38)	1252 (58)	669 (62)	723 (35)	463 (53)	151 (53)	712 (40)	489 (58)	192 (67)	3364 (38)	2204 (57)	1012 (61)
Peak TnT, No. (%)												
N	1097	394	179	597	211	64	738	258	52	2432	863	295
Positive or > reference upper limits	966 (88)	367 (93)	161 (90)	478 (80)	186 (88)	55 (86)	414 (56)	167 (65)	41 (79)	1670 (69)	661 (77)	190 (64)

Year	2006-2008			2009			2010			2006-2010		
Hypertension	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**
Total	**5933**	**2479**	**1459**	**2302**	**954**	**338**	**2081**	**962**	**358**	**10316**	**4395**	**2155**
Peak TnI, No. (%)												
N	426	103	90	68	19	13	387	128	21	881	250	124
Positive or > reference upper limits	243 (57)	73 (71)	71 (79)	45 (66)	12 (63)	12 (92)	203 (52)	82 (64)	12 (57)	534 (61)	180 (72)	102 (82)
Total cholesterol, mmol/L												
N	4188	1909	959	1652	737	249	1363	733	248	7203	3379	1456
Mean (SD)	5.2 (1.3)	5.4 (1.3)	5.5 (1.4)	5.2 (1.3)	5.6 (1.4)	5.7 (1.4)	5.1 (1.3)	5.5 (1.4)	5.4 (1.3)	5.2 (1.3)	5.5 (1.4)	5.5 (1.4)
Median (min, max)	5.0 (3.0, 16.1)	5.3 (3.0, 14.3)	5.4 (3.0, 14.7)	5.1 (3.0, 13.5)	5.5 (3.0, 19.9)	5.6 (3.2, 12.6)	4.9 (3.0, 13.7)	5.4 (3.0, 16.2)	5.3 (3.0, 10.3)	5.0 (3.0, 16.1)	5.4 (3.0, 19.9)	5.4 (3.0, 14.7)
IQR	1.7	1.7	1.6	1.6	1.8	1.7	1.7	1.6	1.6	1.7	1.7	1.7
HDL-C, mmol/L												
N	4237	1848	952	1692	727	251	1379	745	241	7308	3320	1444
Mean (SD)	1.12 (.37)	1.1 (.36)	1.13 (.34)	1.1 (.35)	1.09 (.31)	1.09 (.4)	1.1 (.3)	1.08 (.28)	1.1 (.33)	1.11 (.36)	1.09 (.33)	1.12 (.35)
Median (min, max)	1.09 (.5, 4.94)	1.01 (.5, 4.4.)	1.1 (.5, 4.2.)	1.05 (.5, 4.32)	1.03 (.5, 3.75)	1.02 (.6, 4.6.)	1.09 (.5, 3.68)	1.05 (.5, 2.40)	1.02 (.5, 3.04)	1.08 (.5, 4.94)	1.03 (.5, 4.40)	1.07 (.5, 4.60)
IQR	0.4	0.34	0.39	0.33	0.39	0.35	0.38	0.32	0.36	0.39	0.35	0.38
LDL-C, mmol/L												
N	4131	1827	953	1700	733	249	1363	742	246	7194	3302	1448
Mean (SD)	3.17 (1.18)	3.47 (1.28)	3.56 (1.24)	3.28 (1.17)	3.64 (1.25)	3.72 (1.29)	3.2 (1.24)	3.58 (1.19)	3.44 (1.22)	3.2 (1.19)	3.53 (1.26)	3.57 (1.25)
Median (min, max)	3.07 (1.0, 9.8)	3.40 (1.0, 14.6)	3.50 (1.0, 8.2)	3.18 (1.0, 10.8)	3.60 (1.0, 13)	3.60 (1.0, 9.66)	3.00 (1.0, 10.6)	3.54 (1.0, 11.5)	3.31 (1.0, 8.3)	3.10 (1.0, 10.8)	3.49 (1.0, 14.6)	3.49 (1.0, 9.7)
IQR	1.58	1.63	1.55	1.60	1.60	1.60	1.67	1.48	1.48	1.56	1.62	1.57

Year	2006-2008			2009			2010			2006-2010		
Hypertension	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**
Total	**5933**	**2479**	**1459**	**2302**	**954**	**338**	**2081**	**962**	**358**	**10316**	**4395**	**2155**
Triglycerides, mmol/L												
N	3640	1648	798	1483	632	200	1176	629	209	6299	2909	1207
Mean (SD)	2.09 (1.26)	2.09 (1.33)	2.03 (1.24)	1.85 (.96)	1.96 (1.06)	2.02 (1.07)	1.96 (1.12)	1.94 (1.21)	2.08 (1.52)	2.01 (1.17)	2.03 (1.25)	2.03 (1.26)
Median (min, max)	1.70 (1, 14.0)	1.70 (1, 15.0)	1.69 (1, 13.7)	1.60 (1, 14.0)	1.69 (1, 9.7)	1.70 (1, 8.5)	1.65 (1, 10.8)	1.60 (1, 14.2)	1.60 (1, 15.0)	1.70 (1, 14.0)	1.70 (1, 15.0)	1.69 (1, 15.0)
IQR	1.0	1.1	1.0	0.7	0.9	1.0	0.9	0.9	1.0	1.0	1.0	1.0
Left ventricular ejection fraction, %												
N	2996	1414	694	1352	574	175	1056	517	204	5404	2505	1073
Mean (SD)	47 (13)	46 (12)	46 (13)	48 (13)	47 (11)	48 (13)	46 (14)	45 (13)	46 (13)	47 (13)	46 (12)	47 (13)
Median (min, max)	47 (8, 80)	46 (5, 79)	46 (10, 79)	50 (5, 80)	48 (15, 80)	49 (13, 79)	46 (5, 80)	45 (5, 77)	46 (6, 78)	47 (5, 80)	46 (5, 80)	46 (6, 79)
IQR	16	15	15	15	15	16	19	17	15	16	16	15
ECG, No. (%)												
Inferior leads	1046 (18)	677 (27)	393 (27)	437 (19)	268 (28)	103 (30)	401 (19)	297 (31)	131 (37)	1884 (18)	1242 (28)	627 (29)
Anterior leads	1296 (22)	878 (35)	514 (35)	451 (20)	350 (37)	131 (39)	491 (24)	395 (41)	131 (37)	2238 (22)	1623 (37)	776 (36)
Lateral leads	513 (9)	366 (15)	205 (14)	224 (10)	155 (16)	29 (9)	192 (9)	145 (15)	39 (11)	929 (9)	666 (15)	273 (13)
True posterior	194 (3)	154 (6)	91 (6)	48 (2)	47 (5)	19 (6)	56 (3)	45 (5)	32 (9)	298 (3)	246 (6)	142 (7)
Right ventricle	177 (3)	140 (6)	70 (5)	48 (2)	51 (5)	21 (6)	50 (2)	43 (4)	24 (7)	275 (3)	234 (5)	115 (5)
None	12 (0)	5 (0)	7 (0)	6 (0)	8 (1)	4 (1)	6 (0)	4 (0)	2 (1)	24 (0)	17 (0)	13 (1)
Not stated/ inadequately described	18 (0)	12 (0)	1 (0)	3 (0)	2 (0)	2 (1)	21 (1)	6 (1)	3 (1)	42 (0)	20 (0)	6 (0)

Year	2006-2008			2009			2010			2006-2010		
Hypertension	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**	**Hypertensive**	**Non-Hypertensive**	**Unknown**
Total	**5933**	**2479**	**1459**	**2302**	**954**	**338**	**2081**	**962**	**358**	**10316**	**4395**	**2155**
Pain to needle time, min												
N	1085	794	461	344	281	115	396	344	146	1825	1421	722
Mean (SD)	790.7 (4381)	635.0 (4416)	824.7 (5134)	16658.5 (256827)	2295.8 (31523)	320.7 (437)	1058.0 (9175)	2817.8 (31601)	359.1 (491)	3839.7 (111676)	1490.9 (21190)	650.3 (4117)
Median (min, max)	270.9 (15.3, 87995)	240.3 (26.2, 87991)	235.9 (19.7, 88000)	260.0 (0.0, 4732800)	225.0 (6.6, 528731)	205.3 (0.0, 2910)	235.9 (0.0, 176160)	214.1 (0.0, 528100)	233.7 (19.7, 4548)	264.3 (0.0, 4732800)	229.4 (0.0, 528731)	222.8 (0.0, 88000)
IQR	318.9	273.1	251.2	300.4	246.9	194.4	290.5	294.9	238.1	318.9	275.3	244.7
Door to needle time, min												
N	1092	798	476	401	309	122	427	342	152	1920	1449	750
Mean (SD)	107.4 (161.6)	91.2 (135.2)	106.4 (186.3)	112.5 (207.9)	93.1 (173.6)	74.8 (127.5)	131.8 (226.5)	101.2 (204.3)	122.6 (216.8)	113.9 (188.0)	94.0 (162.2)	104.6 (185.2)
Median (min, max)	57 (2, 1431)	50.5 (1, 1349)	49.5 (1, 1440)	45 (2, 1420)	45 (3, 1440)	35 (3, 825)	50 (5, 1400)	35 (4, 1440)	50 (3, 1410)	55 (2, 1431)	46 (1, 1440)	45 (1, 1440)
IQR	84.0	66.0	76.0	82.0	64.0	62.0	88.0	55.0	93.5	82.5	65.0	75.0

**Cardiac marker is defined as any of the following baseline investigations: 1) Peak CK-MB, 2) Peak CK, 3) Peak TnT, 4) Peak Tnl whereby status Not Done="False" for all investigations*
Note: Not all participating centre performed Troponin T or Troponin I tests
Note: Percentage is to the nearest decimal point

Table 3.6 Cardiac presentation of patients with ACS by pre-morbid dyslipidaemia, NCVD-ACS Registry, 2006-2010

Year	2006-2008			2009			2010			2006-2010		
Dyslipidaemia status	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**
Total	**3279**	**3078**	**3514**	**1248**	**1586**	**760**	**1090**	**1429**	**882**	**5617**	**6093**	**5156**
ACS stratum, No. (%)												
STEMI	1005 (31)	1630 (53)	2012 (57)	502 (40)	723 (46)	456 (60)	499 (46)	731 (51)	572 (65)	2006 (36)	3084 (51)	3040 (59)
NSTEMI	1189 (36)	844 (27)	871 (25)	398 (32)	469 (30)	179 (24)	356 (33)	446 (31)	206 (23)	1943 (35)	1759 (29)	1256 (24)
UA	1085 (33)	604 (20)	631 (18)	348 (28)	394 (25)	125 (16)	235 (22)	252 (18)	104 (12)	1668 (30)	1250 (21)	860 (17)
Systolic blood pressure, mmHg												
N	3232	3034	3422	1233	1557	742	1076	1404	864	5541	5995	5028
Mean (SD)	142 (29)	140 (29)	138 (29)	141 (27)	138 (27)	135 (29)	139 (27)	138 (29)	135 (29)	141 (28)	139 (29)	137 (29)
Median (min, max)	140 (65, 230)	138 (60, 230)	135 (60, 230)	140 (60, 228)	134 (63, 226)	134 (63, 228)	137 (60, 230)	137 (60, 228)	134 (62, 230)	139 (60, 230)	137 (60, 230)	135 (60, 230)
IQR	40	39	38	37	35	38	34	37	36	39	37	38
Diastolic blood pressure, mmHg												
N	3167	2954	3350	1209	1526	727	1058	1360	843	5434	5840	4920
Mean (SD)	81 (16)	81 (17)	81 (17)	82 (16)	80 (15)	80 (18)	81 (16)	81 (16)	80 (17)	81 (16)	81 (16)	81 (17)
Median (min, max)	80 (19, 120)	80 (22, 120)	80 (20, 120)	82 (30, 120)	80 (25, 120)	80 (24, 120)	80 (26, 120)	81 (22, 120)	80 (33, 120)	80 (19, 120)	80 (22, 120)	80 (20, 120)
IQR	22	22	22	21	21	25	20	22	22	21	22	22

Year	2006-2008			2009			2010			2006-2010		
Dyslipidaemia status	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**
Total	**3279**	**3078**	**3514**	**1248**	**1586**	**760**	**1090**	**1429**	**882**	**5617**	**6093**	**5156**
Pulse pressure, mmHg												
N	3142	2935	3329	1205	1514	723	1057	1356	836	5404	5805	4888
Mean (SD)	59 (21)	57 (20)	56 (19)	58 (21)	56 (20)	53 (18)	58 (20)	56 (20)	54 (18)	59 (21)	56 (20)	55 (19)
Median (min, max)	56 (2, 144)	54 (2, 154)	52 (6, 145)	56 (3, 146)	53 (6, 129)	51 (11, 123)	55 (7, 158)	53 (5, 159)	51 (12, 135)	56 (2, 158)	53 (2, 159)	52 (6, 145)
IQR	27	27	25	26	25	24	25	25	23	26	26	25
Heart rate at presentation, beats/min												
N	3229	3035	3423	1238	1563	744	1068	1412	866	5535	6010	5033
Mean (SD)	84 (21)	84 (22)	84 (22)	84 (20)	84 (21)	83 (22)	82 (22)	85 (21)	84 (22)	83 (21)	84 (21)	84 (22)
Median (min, max)	80 (32, 192)	81 (30, 200)	81 (29, 191)	81 (30, 180)	82 (35, 187)	80 (25, 189)	80 (28, 180)	82 (25, 181)	82 (26, 177)	80 (28, 192)	82 (25, 200)	81 (25, 191)
IQR	27	27	29	27	27	28	29	28	29	28	27	29
Episodes of angina in past 24 hours, No. (%)												
0-2	1554 (47)	1512 (49)	1793 (51)	574 (46)	651 (41)	353 (46)	455 (42)	596 (42)	350 (40)	2583 (46)	2759 (45)	2496 (48)
>2	212 (6)	78 (3)	147 (4)	35 (3)	16 (1)	14 (2)	44 (4)	41 (3)	11 (1)	291 (5)	135 (2)	172 (3)
Missing	1513 (46)	1488 (48)	1574 (45)	639 (51)	919 (58)	393 (52)	591 (54)	792 (55)	521 (59)	2743 (49)	3199 (53)	2488 (48)

Year	2006-2008			2009			2010			2006-2010		
Dyslipidaemia status	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**
Total	**3279**	**3078**	**3514**	**1248**	**1586**	**760**	**1090**	**1429**	**882**	**5617**	**6093**	**5156**
Killip classification code, No. (%)												
I	1583 (48)	1454 (47)	1684 (48)	760 (61)	985 (62)	422 (56)	605 (56)	770 (54)	430 (49)	2948 (52)	3209 (53)	2536 (49)
II	606 (18)	483 (16)	613 (17)	209 (17)	241 (15)	124 (16)	182 (17)	277 (19)	131 (15)	997 (18)	1001 (16)	868 (17)
III	129 (4)	122 (4)	137 (4)	51 (4)	48 (3)	22 (3)	33 (3)	52 (4)	34 (4)	213 (4)	222 (4)	193 (4)
IV	88 (3)	92 (3)	161 (5)	34 (3)	48 (3)	48 (6)	43 (4)	57 (4)	73 (8)	165 (3)	197 (3)	282 (5)
Not stated/ inadequately described	873 (27)	927 (30)	919 (26)	194 (16)	264 (17)	144 (19)	227 (21)	273 (19)	214 (24)	1294 (23)	1464 (24)	1277 (25)
Patients with any cardiac marker measurement done, No. (%)	3119 (95)	2903 (94)	3103 (88)	1190 (95)	1527 (96)	698 (92)	1020 (94)	1352 (95)	809 (92)	5329 (95)	5782 (95)	4610 (89)
Peak CK-MB, Unit/L, No. (%)												
N	1932	1776	1668	644	1045	344	638	890	388	3214	3711	2400
>25 reference upper limits	898 (46)	926 (52)	854 (51)	306 (48)	435 (42)	156 (45)	294 (46)	415 (47)	157 (40)	1498 (47)	1776 (48)	1167 (49)
Peak CK, Unit/L, No. (%)												
N	2839	2628	2825	1121	1453	627	925	1252	732	4885	5333	4184
>2x reference upper limits	955 (34)	1308 (50)	1587 (56)	439 (39)	570 (39)	328 (52)	395 (43)	583 (47)	415 (57)	1789 (37)	2461 (46)	2330 (56)
Peak TnT, No. (%)												
N	690	496	484	323	419	130	396	492	160	1409	1407	774
Positive or > reference upper limits	612 (89)	454 (92)	428 (88)	294 (91)	391 (93)	127 (98)	281 (71)	318 (65)	132 (83)	1187 (84)	1163 (83)	687 (89)

Year	2006-2008			2009			2010			2006-2010		
Dyslipidaemia status	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**
Total	**3279**	**3078**	**3514**	**1248**	**1586**	**760**	**1090**	**1429**	**882**	**5617**	**6093**	**5156**
Peak TnI, No. (%)												
N	234	146	239	23	42	35	142	305	89	399	493	363
Positive or > reference upper limits	121 (52)	100 (68)	166 (69)	18 (78)	32 (76)	25 (71)	66 (46)	191 (63)	54 (61)	205 (51)	323 (66)	245 (67)
Total cholesterol, mmol/L												
N	2274	2331	2451	937	1152	549	772	979	593	3983	4462	3593
Mean (SD)	5.2 (1.3)	5.3 (1.3)	5.4 (1.3)	5.4 (1.4)	5.2 (1.2)	5.5 (1.4)	5.3 (1.4)	5.2 (1.3)	5.4 (1.4)	5.3 (1.4)	5.2 (1.3)	5.4 (1.4)
Median (min, max)	5 (3.0, 16.1)	5.1 (3.0, 14.3)	5.3 (3.0, 14.7)	5.3 (3.0, 19.9)	5.1 (3.0, 14.9)	5.4 (3.0, 13.5)	5.2 (3.0, 15)	5 (3.0, 13.7)	5.3 (3.0, 16.2)	5.1 (3.0, 19.9)	5.1 (3.0, 14.9)	5.3 (3.0, 16.2)
IQR	1.8	1.7	1.7	1.8	1.6	1.7	1.8	1.7	1.8	1.7	1.7	1.7
HDL-C, mmol/L												
N	2317	2297	2423	956	1160	554	787	999	579	4060	4456	3556
Mean (SD)	1.12 (.38)	1.11 (.38)	1.11 (.34)	1.09 (.33)	1.1 (.34)	1.1 (.37)	1.11 (.29)	1.09 (.28)	1.08 (.33)	1.11 (.35)	1.1 (.35)	1.11 (.35)
Median (min, max)	1.07 (.5, 4.50)	1.06 (.5, 4.94)	1.1 (.5, 4.24)	1.01 (.5, 4.30)	1.05 (.5, 4.32)	1.06 (.5, 4.60)	1.1 (.5, 2.40)	1.07 (.5, 2.32)	1.01 (.5, 3.68)	1.06 (.5, 4.50)	1.06 (.5, 4.94)	1.08 (.5, 4.60)
IQR	0.39	0.39	0.39	0.32	0.35	0.36	0.4	0.33	0.41	0.38	0.36	0.38
LDL-C, mmol/L												
N	2262	2256	2393	959	1171	552	783	986	582	4004	4413	3527
Mean (SD)	3.14 (1.23)	3.29 (1.21)	3.46 (1.21)	3.45 (1.25)	3.3 (1.13)	3.61 (1.29)	3.33 (1.32)	3.31 (1.18)	3.44 (1.20)	3.25 (1.26)	3.3 (1.18)	3.48 (1.23)
Median (min, max)	3 (1.0, 14.6)	3.19 (1.0, 10.1)	3.4 (1.0, 8.6)	3.3 (1.1, 10.0)	3.23 (1.0, 13.0)	3.45 (1.1, 10.8)	3.2 (1.0, 11.5)	3.17 (1.1, 10.6)	3.33 (1.0, 9.1)	3.1 (1.0, 14.6)	3.2 (1.0, 13.0)	3.4 (1.0, 10.8)
IQR	1.69	1.60	1.60	1.70	1.50	1.64	1.71	1.58	1.60	1.68	1.54	1.60

Year	2006-2008			2009			2010			2006-2010		
Dyslipidaemia status	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**
Total	**3279**	**3078**	**3514**	**1248**	**1586**	**760**	**1090**	**1429**	**882**	**5617**	**6093**	**5156**
Triglycerides, mmol/L												
N	2008	1993	2085	847	1006	462	676	830	508	3531	3829	3055
Mean (SD)	2.14 (1.32)	2.04 (1.21)	2.07 (1.3)	1.99 (1.06)	1.82 (0.90)	1.90 (1.08)	2.06 (1.29)	1.87 (1.08)	2.00 (1.25)	2.09 (1.25)	1.95 (1.11)	2.03 (1.26)
Median (min, max)	1.78 (1.0, 13.0)	1.70 (1.0, 12.9)	1.70 (1.0, 15.0)	1.70 (1.0, 14.0)	1.60 (1.0, 9.0)	1.60 (1.0, 12.2)	1.70 (1.0, 10.8)	1.60 (1.0, 14.2)	1.61 (1.0, 15.0)	1.70 (1.0, 14.0)	1.61 (1.0, 14.2)	1.70 (1.0, 15.0)
IQR	1.06	1	1.02	0.9	0.7	0.84	1	0.85	0.9	1.05	0.9	1
Left ventricular ejection fraction, %												
N	1657	1669	1778	741	962	398	582	745	450	2980	3376	2626
Mean (SD)	46 (13)	47 (12)	47 (13)	47 (12)	48 (12)	47 (13)	46 (13)	46 (14)	46 (13)	47 (13)	47 (13)	47 (13)
Median (min, max)	46 (5, 80)	46 (7, 80)	47 (7, 80)	49 (10, 80)	50 (5, 80)	47 (10, 80)	47 (10, 78)	45 (10, 80)	45 (5, 79)	47 (5, 80)	47 (5, 80)	46 (5, 80)
IQR	17	15	15	15	15	18	19	18	17	17	15	15
ECG, No. (%)												
Inferior leads	453 (14)	778 (25)	885 (25)	208 (17)	373 (24)	227 (30)	221 (20)	336 (24)	272 (31)	882 (16)	1487 (24)	1384 (27)
Anterior leads	607 (19)	897 (29)	1184 (34)	307 (25)	375 (24)	250 (33)	280 (26)	423 (30)	314 (36)	1194 (21)	1695 (28)	1748 (34)
Lateral leads	228 (7)	324 (11)	532 (15)	134 (11)	178 (11)	96 (13)	106 (10)	163 (11)	107 (12)	468 (8)	665 (11)	735 (14)
True posterior	76 (2)	144 (5)	219 (6)	18 (1)	53 (3)	43 (6)	25 (2)	61 (4)	47 (5)	119 (2)	258 (4)	309 (6)
Right ventricle	65 (2)	146 (5)	176 (5)	25 (2)	54 (3)	41 (5)	23 (2)	54 (4)	40 (5)	113 (2)	254 (4)	257 (5)
None	8 (0)	7 (0)	9 (0)	8 (1)	8 (1)	2 (0)	6 (1)	3 (0)	3 (0)	22 (0)	18 (0)	14 (0)
Not stated/ inadequately described	9 (0)	13 (0)	9 (0)	0 (0)	3 (0)	4 (1)	12 (1)	9 (1)	9 (1)	21 (0)	25 (0)	22 (0)

Year	2006-2008			2009			2010			2006-2010		
Dyslipidaemia status	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**	**Dyslipidaemia**	**Non-Dyslipidaemia**	**Unknown**
Total	**3279**	**3078**	**3514**	**1248**	**1586**	**760**	**1090**	**1429**	**882**	**5617**	**6093**	**5156**
Pain to needle time, min												
N	437	843	1060	206	311	221	233	366	284	876	1520	1565
Mean (SD)	650.4 (2468)	755.2 (5250)	774.9 (4613)	3164.9 (36751)	2439.4 (30372)	22633.1 (318517)	2313.5 (20324)	2024.6 (27606)	565.7 (2768)	1684.1 (20740)	1405.5 (19678)	3823.6 (119770)
Median (min, max)	260 (28.4, 45001)	244.7 (19.7, 87995)	253.4 (15.3, 88000)	234.8 (2.2, 526110)	240.3 (6.6, 528731)	220.6 (15.3, 4732800)	225 (15.3, 256556)	240.3 (15.3, 528100)	223.9 (19.7, 45229)	240.3 (2.2, 526110)	244.7 (6.6, 528731)	240.3 (15.3, 4732800)
IQR	329.9	275.3	290.5	275.3	222.8	270.9	275.3	340.8	289.5	296	270.9	286.2
Door to needle time, min												
N	439	853	1074	225	366	241	237	382	302	901	1601	1617
Mean (SD)	104.9 (160.7)	93.8 (127.0)	106.7 (179.5)	107.1 (194.8)	96.9 (185.0)	97.2 (179.0)	136 (251.3)	105.8 (193.5)	122.1 (216.1)	113.6 (196.9)	97.4 (159.2)	108.2 (186.8)
Median (min, max)	55 (2, 1160)	58 (1, 1349)	50 (1, 1440)	50 (2, 1420)	45 (3, 1440)	40 (2, 1395)	40 (4, 1400)	43.5 (4, 1440)	50 (3, 1410)	50 (2, 1420)	50 (1, 1440)	50 (1, 1440)
IQR	76	79	76	70	68	70	71	67	85	72	75	77

**Cardiac marker is defined as any of the following baseline investigations: 1) Peak CK-MB, 2) Peak CK, 3) Peak TnT, 4) Peak Tnl whereby status Not Done="False" for all investigations*
Note: Not all participating centre performed Troponin T or Troponin I tests
Note: Percentage is to the nearest decimal point

Table 3.7 TIMI risk score of patients with ACS by ACS Stratum, NCVD-ACS Registry, 2006-2010

Year	2006		2007		2008		2009		2010		2006-2010	
ACS Stratum	STEMI	NSTEMI/ UA	STEMI	NSTEMI/ UA	STEMI	NSTEMI/ UA	STEMI	NSTEMI/ UA	STEMI	NSTEMI/ UA	STEMI	NSTEMI/ UA
TIMI Risk Score, No. (%)												
0	201 (14)	382 (19)	27 (2)	118 (6)	29 (2)	169 (13)	15 (1)	188 (10)	27 (1)	112 (7)	299 (4)	969 (11)
1	153 (11)	291 (15)	172 (10)	378 (19)	150 (10)	300 (23)	153 (9)	343 (18)	205 (11)	290 (18)	833 (10)	1602 (18)
2	280 (20)	459 (23)	335 (20)	547 (28)	296 (19)	320 (25)	352 (21)	468 (24)	355 (20)	429 (27)	1618 (20)	2223 (25)
3	194 (14)	437 (22)	316 (19)	456 (23)	248 (16)	285 (22)	305 (18)	470 (25)	318 (18)	407 (25)	1381 (17)	2055 (24)
4	176 (12)	248 (13)	245 (15)	302 (15)	217 (14)	163 (12)	255 (15)	265 (14)	249 (14)	243 (15)	1142 (14)	1221 (14)
5	162 (11)	118 (6)	232 (14)	126 (6)	224 (15)	61 (5)	238 (14)	138 (7)	256 (14)	96 (6)	1112 (14)	539 (6)
6	83 (6)	25 (1)	123 (7)	23 (1)	118 (8)	8 (1)	128 (8)	40 (2)	139 (8)	19 (1)	591 (7)	115 (1)
7	89 (6)	5 (0)	110 (7)	3 (0)	128 (8)	0 (0)	121 (7)	1 (0)	118 (7)	3 (0)	566 (7)	12 (0)
8	51 (4)		69 (4)		48 (3)		60 (4)		58 (3)		286 (4)	
9	21 (1)		31 (2)		37 (2)		30 (2)		38 (2)		157 (2)	
10	14 (1)		21 (1)		32 (2)		11 (1)		29 (2)		107 (1)	
11	1 (0)		3 (0)		4 (0)		8 (0)		6 (0)		22 (0)	
12	1 (0)		3 (0)		1 (0)		3 (0)		3 (0)		11 (0)	
13	1 (0)		0 (0)		1 (0)		2 (0)		1 (0)		5 (0)	

CHAPTER 4
TREATMENT

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Summary

1. Elderly patients spent more days in CCU or ICU/CICU but similar length of admission in hospital following ACS.
2. Following STEMI, 7% of patients were treated with primary angioplasty and 74% received thrombolysis.
3. Thrombolysis was given more in the young age group and primary angioplasty was provided more in the elderly age group.
4. The mean door to needle time was 105mins and the median was 50mins. The mean door to balloon time was 226mins and the median was 117mins.
5. In NSTEMI/UA, male and younger patients tend to undergo more PCI compared to female, middle age and elderly patients.
6. About 93% of patients were prescribed with aspirin and 89% of patients received statins following ACS.

In this chapter, we have summarised the treatment given to the patients admitted with acute coronary syndrome (ACS) entered in the NCVD-ACS Registry from 2006 to 2010. This chapter will also describe the pattern of admission, revascularization therapy and pharmacological therapy in patients who were admitted with ACS.

Pattern of admission

The total number of days of admission was similar in all of the ACS spectrums. The median of total number of days of admission was five days in STEMI and NSTEMI and four days in unstable angina, which was noted to be consistent between years 2006 and 2010. [Table 4.1] The total days of admission was noted to be similar in all age group (young, middle age and elderly). [Table 4.2] There was no difference in the number of days spent in hospital in all three ethnic groups (Malay, Chinese and Indian) admitted with ACS. [Table 4.4]

The number of days spent in CCU or ICU/CICU was also similar in the entire ACS spectrum. Patients admitted with STEMI, NSTEMI and unstable angina spent a median of two to three days in CCU or ICU/CICU. This was observed in each year from 2006 to 2010. [Table 4.1] The number of days spent in CCU or ICU/ICU increase with age group and this was observed in all ACS spectrums. [Table 4.2] There was no difference in the number of days spent in CCU or ICU/CICU between gender and all three ethnic groups. [Table 4.3 & Table 4.4]

Revascularisation therapy

In patients presented with STEMI, 74% received thrombolysis at presentation and 7% of patients proceeded directly to primary angioplasty. Twelve percent of patients did not receive any primary revascularization therapy (thrombolysis/primary angioplasty) because of late presentation or missed diagnosis. Four percent of patients did not receive any thrombolysis because of contraindication. [Table 4.1] Thrombolysis was given more in males (75%) than females (66%) and primary angioplasty was noted to be similar in both genders. [Table 4.3] Thrombolysis was used more in the young age group (77%) as compared to the elderly age group (69%) and vise versa noted in the group proceeded to

primary angioplasty, higher in the elderly age group (7%) and lower in the younger age group (6%). [Table 4.2] The Chinese received the least thrombolysis but the most primary angioplasty as compared to the Malays and Indians. [Table 4.4] The mean door to needle time was 105mins and median 50mins. The mean door to balloon time was 226mins and median 117mins. [Table 4.5]

In NSTEMI/UA group, most of the patients were treated medically. About 13% of patients with NSTEMI and 6% of patients with unstable angina were treated with PCI on the same admission. Two percent of patients with NSTEMI and 1% of patients with UA underwent CABG on the same admission. [Table 4.1] Male gender and younger age group tend to undergo PCI more compared to female, middle age and elderly patients. There was no difference in patients treated with PCI following NSTEMI/UA between the different ethnic groups. [Table 4.8]

Pharmacological therapy

The use of aspirin was noted to be as high as 93% and up to 72% of patients received ADP antagonist in the entire ACS spectrum. There was no difference in the use of aspirin and ADP antagonist between different age groups, gender and ethnic groups. The use of LMWH was noted to be as high as 73% and unfractionated heparin up to 11%. LMWH was given more in unstable angina and NSTEMI patients than STEMI patients. GP IIb/IIIa receptor inhibitor usage was low (<5%) in the ACS spectrum. [Table 4.1]

Up to 89% of patients admitted with ACS were treated with statins and 68% of patients were on beta-blockers. [Table 4.1] Younger patients were more likely to receive beta-blockers compared to the elderly patients. ACE inhibitors were used in up to 63% and Angiotensin II receptor blocker in up to 11%. [Table 4.1] It was noted that more males received ACE inhibitors than females following ACS [Table 4.3 & Table 4.7] but there was no difference in the use of ACE inhibitors in different age groups and race. Up to 31% of patients received oral hypoglycaemic agent and up to 27% of patients were on insulin. More Indians were on oral hypoglycaemic agent and insulin as compared to Malays and Chinese. [Table 4.4] Diuretics were used in up to 26% and anti-arrhythmic agents were used in up to 8% of patients.

Table 4.1 Summary of treatments for patients with ACS by ACS stratum, NCVD-ACS Registry, 2006-2010

Year	2006-2008			2009			2010			2006-2010		
ACS Stratum	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**
Total	**4647**	**2904**	**2320**	**1681**	**1046**	**867**	**1802**	**1008**	**591**	**8130**	**4958**	**3778**
Total admission days**												
N	4360	2763	2208	1602	1016	846	1536	892	543	7498	4671	3597
Mean (SD)	6 (3)	6 (4)	5 (3)	6 (3)	6 (4)	5 (3)	6 (4)	6 (4)	4 (2)	6 (3)	6 (4)	5 (3)
Median (min, max)	5 (1, 30)	5 (1, 30)	4 (1, 30)	5 (1, 30)	5 (1, 30)	4 (1, 30)	5 (1, 30)	5 (1, 30)	4 (1, 27)	5 (1, 30)	5 (1, 30)	4 (1, 30)
IQR	3	3	2	2	3	2	2	4	2	2	3	2
Number of days on CCU												
N	3359	1119	336	1220	488	373	1223	280	57	5802	1887	766
Mean (SD)	3 (3)	3 (3)	3 (3)	3 (2)	4 (4)	3 (3)	3 (3)	4 (3)	3 (1)	3 (3)	4 (3)	3 (3)
Median (min, max)	3 (1, 29)	3 (1, 30)	2 (1, 24)	3 (1, 24)	3 (1, 30)	2 (1, 28)	3 (1, 30)	3 (1, 16)	2 (1, 7)	3 (1, 30)	3 (1, 30)	2 (1, 28)
IQR	2	2	3	2	3	2	2	3	1	2	2	2
Number of days on ICU/CICU												
N	108	155	40	36	22	6	23	12	7	167	189	53
Mean (SD)	3 (3)	3 (3)	3 (2)	3 (3)	4 (6)	2 (1)	3 (1)	3 (2)	2 (1)	3 (3)	4 (4)	3 (2)
Median (min, max)	2 (1, 17)	3 (1, 24)	3 (1, 11)	2 (2, 14)	3 (1, 24)	2 (1, 4)	3 (1, 5)	3 (1, 8)	2 (1, 4)	2 (1, 17)	3 (1, 24)	3 (1, 11)
IQR	2	2	3	2	2	2	2	2	3	2	2	3

Year	2006-2008			2009			2010			2006-2010		
ACS Stratum	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**
Total	**4647**	**2904**	**2320**	**1681**	**1046**	**867**	**1802**	**1008**	**591**	**8130**	**4958**	**3778**
Fibrinolytic therapy, No. (%)												
Given	3377 (73)			1258 (75)			1347 (75)			5982 (74)		
Not given-proceeded directly to primary angioplasty	319 (7)			90 (5)			140 (8)			549 (7)		
Not given-Contraindicated	188 (4)			82 (5)			64 (4)			334 (4)		
Not given-Missed thrombolysis	587 (13)			201 (12)			202 (11)			990 (12)		
Not given-Others***	176 (4)			50 (3)			49 (3)			275 (3)		
Cardiac catheterisation, No. (%)												
Yes	940 (20)	678 (23)	241 (10)	425 (25)	266 (25)	65 (7)	379 (21)	181 (18)	43 (7)	1744 (21)	1125 (23)	349 (9)
No	3562 (77)	2160 (74)	2046 (88)	1191 (71)	761 (73)	789 (91)	1334 (74)	785 (78)	526 (89)	6087 (75)	3706 (75)	3361 (89)
Number transferred to another centre	145 (3)	66 (2)	33 (1)	65 (4)	19 (2)	13 (1)	89 (5)	42 (4)	22 (4)	299 (4)	127 (3)	68 (2)
Percutaneous Coronary Intervention, No. (%)												
Yes	856 (18)	415 (14)	167 (7)	341 (20)	142 (14)	36 (4)	275 (15)	101 (10)	22 (4)	1472 (18)	658 (13)	225 (6)
No	3791 (82)	2489 (86)	2153 (93)	1340 (80)	904 (86)	831 (96)	1527 (85)	907 (90)	569 (96)	6658 (82)	4300 (87)	3553 (94)
CABG, No. (%)												
Yes	28 (1)	83 (3)	29 (1)	4 (0)	19 (2)	9 (1)	6 (0)	8 (1)	4 (1)	38 (0)	110 (2)	42 (1)
No	4619 (99)	2821 (97)	2291 (99)	1677 (100)	1027 (98)	858 (99)	1796 (100)	1000 (99)	587 (99)	8092 (100)	4848 (98)	3736 (99)

Year	2006-2008			2009			2010			2006-2010		
ACS Stratum	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**	**STEMI**	**NSTEMI**	**UA**
Total	**4647**	**2904**	**2320**	**1681**	**1046**	**867**	**1802**	**1008**	**591**	**8130**	**4958**	**3778**
Pre-admission aspirin use, No. (%)												
Yes	880 (19)	1242 (43)	1151 (50)	383 (23)	550 (53)	446 (51)	363 (20)	426 (42)	325 (55)	1626 (20)	2218 (45)	1922 (51)
No	3303 (71)	1308 (45)	792 (34)	1218 (72)	477 (46)	400 (46)	1350 (75)	524 (52)	241 (41)	5871 (72)	2309 (47)	1433 (38)
Unknown	464 (10)	354 (12)	377 (16)	80 (5)	19 (2)	21 (2)	89 (5)	58 (6)	25 (4)	633 (8)	431 (9)	423 (11)
Pharmacological therapy given during admission, No. (%)												
Aspirin	4318 (93)	2560 (88)	2013 (87)	1578 (94)	978 (93)	815 (94)	1703 (95)	935 (93)	524 (89)	7599 (93)	4473 (90)	3352 (89)
ADP antagonist	3154 (68)	1798 (62)	1268 (55)	1309 (78)	850 (81)	708 (82)	1411 (78)	782 (78)	397 (67)	5874 (72)	3430 (69)	2373 (63)
GP receptor inhibitor	165 (4)	99 (3)	29 (1)	86 (5)	19 (2)	6 (1)	61 (3)	26 (3)	17 (3)	312 (4)	144 (3)	52 (1)
Unfractionated heparin	475 (10)	377 (13)	318 (14)	154 (9)	78 (7)	38 (4)	244 (14)	98 (10)	29 (5)	873 (11)	553 (11)	385 (10)
LMWH	1598 (34)	2040 (70)	1592 (69)	714 (42)	847 (81)	750 (87)	763 (42)	737 (73)	455 (77)	3075 (38)	3624 (73)	2797 (74)
Beta blocker	2957 (64)	1864 (64)	1598 (69)	1012 (60)	676 (65)	605 (70)	1021 (57)	607 (60)	376 (64)	4990 (61)	3147 (63)	2579 (68)
ACE inhibitor	2636 (57)	1529 (53)	1438 (62)	909 (54)	595 (57)	596 (69)	920 (51)	501 (50)	331 (56)	4465 (55)	2625 (53)	2365 (63)
Angiotensin II receptor blocker	221 (5)	307 (11)	203 (9)	116 (7)	131 (13)	75 (9)	114 (6)	122 (12)	69 (12)	451 (6)	560 (11)	347 (9)
Statin	4166 (90)	2530 (87)	2024 (87)	1468 (87)	878 (84)	747 (86)	1625 (90)	881 (87)	528 (89)	7259 (89)	4289 (87)	3299 (87)
Other lipid lowering agent	190 (4)	197 (7)	124 (5)	142 (8)	90 (9)	45 (5)	76 (4)	57 (6)	42 (7)	408 (5)	344 (7)	211 (6)
Diuretics	1187 (26)	1137 (39)	643 (28)	325 (19)	388 (37)	188 (22)	405 (22)	391 (39)	168 (28)	1917 (24)	1916 (39)	999 (26)
Calcium antagonist	318 (7)	626 (22)	489 (21)	109 (6)	203 (19)	145 (17)	94 (5)	226 (22)	140 (24)	521 (6)	1055 (21)	774 (20)
Oral hypoglycaemic agent	1053 (23)	842 (29)	702 (30)	356 (21)	303 (29)	301 (35)	379 (21)	282 (28)	182 (31)	1788 (22)	1427 (29)	1185 (31)
Insulin	1154 (25)	769 (26)	482 (21)	349 (21)	259 (25)	153 (18)	435 (24)	286 (28)	108 (18)	1938 (24)	1314 (27)	743 (20)
Anti-arrhythmic agent	359 (8)	224 (8)	100 (4)	78 (5)	91 (9)	27 (3)	149 (8)	72 (7)	24 (4)	586 (7)	387 (8)	151 (4)

Table 4.2 Treatments for patients with STEMI by age group (years), NCVD-ACS Registry, 2006-2010

Year	2006-2008			2009			2010			2006-2010		
Age group*	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**
Total	**344**	**2555**	**1748**	**145**	**909**	**627**	**146**	**1006**	**650**	**635**	**4470**	**3025**
Total admission days**												
N	324	2402	1634	136	877	589	128	857	551	588	4136	2774
Mean (SD)	5 (2)	6 (3)	6 (4)	6 (2)	6 (3)	6 (3)	6 (2)	6 (3)	6 (4)	5 (2)	6 (3)	6 (4)
Median (min, max)	5 (1, 27)	5 (1, 30)	5 (1, 30)	5 (1, 18)	5 (1, 30)	5 (1, 25)	5 (1, 16)	5 (1, 30)	5 (1, 28)	5 (1, 27)	5 (1, 30)	5 (1, 30)
IQR	2	2	3	2	2	3	2	2	3	2	2	3
Number of days on CCU												
N	244	1880	1235	109	663	448	103	681	439	456	3224	2122
Mean (SD)	3 (2)	3 (2)	4 (3)	3 (2)	4 (2)	3 (2)	3 (2)	3 (3)	4 (3)	3 (2)	3 (2)	3 (3)
Median (min, max)	3 (1, 17)	3 (1, 29)	3 (1, 28)	3 (1, 9)	3 (1, 21)	3 (1, 24)	3 (1, 12)	3 (1, 30)	3 (1, 20)	3 (1, 17)	3 (1, 30)	3 (1, 28)
IQR	2	2	2	2	2	2	2	2	2	2	2	2
Number of days on ICU/CICU												
N	9	59	40	2	16	18	1	16	6	12	91	64
Mean (SD)	2 (1)	3 (3)	4 (4)	3 (1)	4 (3)	3 (2)	1 (.)	3 (1)	3 (1)	2 (1)	3 (3)	4 (3)
Median (min, max)	2 (1, 4)	2 (1, 17)	3 (1, 17)	3 (2, 4)	2 (2, 14)	3 (2, 9)	1 (1, 1)	3 (1, 5)	3 (1, 4)	2 (1, 4)	2 (1, 17)	3 (1, 17)
IQR	1	3	3	2	2	2	0	2	1	2	2	3

**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*

***Total admission days is derived as Outcome date – Admission date + 1*

Year	2006-2008			2009			2010			2006-2010		
Age group*	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**
Total	**344**	**2555**	**1748**	**145**	**909**	**627**	**146**	**1006**	**650**	**635**	**4470**	**3025**
Fibrinolytic therapy, No. (%)												
Given	259 (75)	1943 (76)	1175 (67)	119 (82)	698 (77)	441 (70)	113 (77)	764 (76)	470 (72)	491 (77)	3405 (76)	2086 (69)
Not given-proceeded directly to primary angioplasty	20 (6)	167 (7)	132 (8)	6 (4)	50 (6)	34 (5)	9 (6)	90 (9)	41 (6)	35 (6)	307 (7)	207 (7)
Not given-Contraindicated	10 (3)	84 (3)	94 (5)	3 (2)	29 (3)	50 (8)	3 (2)	23 (2)	38 (6)	16 (3)	136 (3)	182 (6)
Not given-Missed thrombolysis	40 (12)	282 (11)	265 (15)	15 (10)	102 (11)	84 (13)	19 (13)	105 (10)	78 (12)	74 (12)	489 (11)	427 (14)
Not given-Others***	15 (4)	79 (3)	82 (5)	2 (1)	30 (3)	18 (3)	2 (1)	24 (2)	23 (4)	19 (3)	133 (3)	123 (4)
Cardiac catheterisation, No. (%)												
Yes	82 (24)	538 (21)	320 (18)	44 (30)	247 (27)	134 (21)	31 (21)	221 (22)	127 (20)	157 (25)	1006 (23)	581 (19)
No	247 (72)	1939 (76)	1376 (79)	94 (65)	627 (69)	470 (75)	106 (73)	736 (73)	492 (76)	447 (70)	3302 (74)	2338 (77)
Number transferred to another centre	15 (4)	78 (3)	52 (3)	7 (5)	35 (4)	23 (4)	9 (6)	49 (5)	31 (5)	31 (5)	162 (4)	106 (4)
Percutaneous Coronary Intervention, No. (%)												
Yes	66 (19)	501 (20)	289 (17)	32 (22)	203 (22)	106 (17)	21 (14)	167 (17)	87 (13)	119 (19)	871 (19)	482 (16)
No	278 (81)	2054 (80)	1459 (83)	113 (78)	706 (78)	521 (83)	125 (86)	839 (83)	563 (87)	516 (81)	3599 (81)	2543 (84)
CABG, No. (%)												
Yes	0 (0)	13 (1)	15 (1)	0 (0)	3 (0)	1 (0)	0 (0)	4 (0)	2 (0)	0 (0)	20 (0)	18 (1)
No	344 (100)	2542 (99)	1733 (99)	145 (100)	906 (100)	626 (100)	146 (100)	1002 (100)	648 (100)	635 (100)	4450 (100)	3007 (99)

****'Not given-Others' includes missing and refusal*

Year	2006-2008			2009			2010			2006-2010		
Age group*	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**
Total	**344**	**2555**	**1748**	**145**	**909**	**627**	**146**	**1006**	**650**	**635**	**4470**	**3025**
Pre-admission aspirin use, No. (%)												
Yes	46 (13)	464 (18)	370 (21)	25 (17)	190 (21)	168 (27)	29 (20)	196 (19)	138 (21)	100 (16)	850 (19)	676 (22)
No	269 (78)	1833 (72)	1201 (69)	110 (76)	681 (75)	427 (68)	110 (75)	754 (75)	486 (75)	489 (77)	3268 (73)	2114 (70)
Unknown	29 (8)	258 (10)	177 (10)	10 (7)	38 (4)	32 (5)	7 (5)	56 (6)	26 (4)	46 (7)	352 (8)	235 (8)
Pharmacological therapy given during admission, No. (%)												
Aspirin	322 (94)	2391 (94)	1605 (92)	141 (97)	857 (94)	580 (93)	141 (97)	953 (95)	609 (94)	604 (95)	4201 (94)	2794 (92)
ADP antagonist	226 (66)	1697 (66)	1231 (70)	113 (78)	719 (79)	477 (76)	118 (81)	794 (79)	499 (77)	457 (72)	3210 (72)	2207 (73)
GP receptor inhibitor	15 (4)	87 (3)	63 (4)	6 (4)	50 (6)	30 (5)	4 (3)	36 (4)	21 (3)	25 (4)	173 (4)	114 (4)
Unfractionated heparin	37 (11)	260 (10)	178 (10)	13 (9)	95 (10)	46 (7)	20 (14)	151 (15)	73 (11)	70 (11)	506 (11)	297 (10)
LMWH	141 (41)	864 (34)	593 (34)	59 (41)	364 (40)	291 (46)	66 (45)	427 (42)	270 (42)	266 (42)	1655 (37)	1154 (38)
Beta blocker	236 (69)	1723 (67)	998 (57)	95 (66)	572 (63)	345 (55)	89 (61)	594 (59)	338 (52)	420 (66)	2889 (65)	1681 (56)
ACE inhibitor	198 (58)	1525 (60)	913 (52)	88 (61)	466 (51)	355 (57)	73 (50)	524 (52)	323 (50)	359 (57)	2515 (56)	1591 (53)
Angiotensin II receptor blocker	17 (5)	108 (4)	96 (5)	8 (6)	66 (7)	42 (7)	14 (10)	53 (5)	47 (7)	39 (6)	227 (5)	185 (6)
Statin	306 (89)	2316 (91)	1544 (88)	129 (89)	795 (87)	544 (87)	129 (88)	910 (90)	586 (90)	564 (89)	4021 (90)	2674 (88)
Other lipid lowering agent	21 (6)	115 (5)	54 (3)	17 (12)	80 (9)	45 (7)	6 (4)	47 (5)	23 (4)	44 (7)	242 (5)	122 (4)
Diuretics	52 (15)	576 (23)	559 (32)	18 (12)	157 (17)	150 (24)	21 (14)	187 (19)	197 (30)	91 (14)	920 (21)	906 (30)
Calcium antagonist	14 (4)	132 (5)	172 (10)	7 (5)	58 (6)	44 (7)	2 (1)	52 (5)	40 (6)	23 (4)	242 (5)	256 (8)
Oral hypoglycaemic agent	60 (17)	639 (25)	354 (20)	25 (17)	200 (22)	131 (21)	24 (16)	239 (24)	116 (18)	109 (17)	1078 (24)	601 (20)
Insulin	55 (16)	650 (25)	449 (26)	17 (12)	186 (20)	146 (23)	23 (16)	239 (24)	173 (27)	95 (15)	1075 (24)	768 (25)
Anti-arrhythmic agent	17 (5)	180 (7)	162 (9)	9 (6)	31 (3)	38 (6)	10 (7)	73 (7)	66 (10)	36 (6)	284 (6)	266 (9)

Table 4.3 Treatments for patients with STEMI by gender, NCVD-ACS Registry, 2006-2010

Year	2006-2008		2009		2010		2006-2010	
Gender	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Total	**3943**	**704**	**1452**	**229**	**1546**	**256**	**6941**	**1189**
Total admission days*								
N	3704	656	1385	217	1329	207	6418	1080
Mean (SD)	6 (3)	7 (4)	6 (3)	6 (3)	6 (4)	7 (4)	6 (3)	7 (4)
Median (min, max)	5 (1, 30)	6 (1, 29)	5 (1, 30)	5 (1, 25)	5 (1, 30)	6 (1, 23)	5 (1, 30)	5 (1, 29)
IQR	2	4	2	3	2	2	2	3
Number of days on CCU								
N	2888	471	1060	160	1044	179	4992	810
Mean (SD)	3 (3)	4 (3)	3 (2)	4 (3)	3 (3)	4 (3)	3 (2)	4 (3)
Median (min, max)	3 (1, 29)	3 (1, 28)	3 (1, 24)	3 (1, 24)	3 (1, 30)	3 (1, 19)	3 (1, 30)	3 (1, 28)
IQR	2	2	2	2	2	2	2	2
Number of days on ICU/CICU								
N	86	22	33	3	19	4	138	29
Mean (SD)	4 (3)	3 (2)	3 (3)	3 (1)	3 (1)	3 (1)	3 (3)	3 (2)
Median (min, max)	2 (1, 17)	2 (1, 11)	2 (2, 14)	4 (2, 4)	3 (1, 5)	3 (2, 3)	2 (1, 17)	2 (1, 11)
IQR	3	2	2	2	3	1	2	2
Fibrinolytic therapy, No. (%)								
Given	2914 (74)	463 (66)	1100 (76)	158 (69)	1180 (76)	167 (65)	5194 (75)	788 (66)
Not given-proceeded directly to primary angioplasty	274 (7)	45 (6)	76 (5)	14 (6)	114 (7)	26 (10)	464 (7)	85 (7)
Not given-Contraindicated	150 (4)	38 (5)	67 (5)	15 (7)	45 (3)	19 (7)	262 (4)	72 (6)
Not given-Missed thrombolysis	459 (12)	128 (18)	165 (11)	36 (16)	167 (11)	35 (14)	791 (11)	199 (17)
Not given-Others**	146 (4)	30 (4)	44 (3)	6 (3)	40 (3)	9 (4)	230 (3)	45 (4)

*** 'Not given-Others' includes missing and refusal*

Year	**2006-2008**		**2009**		**2010**		**2006-2010**	
Gender	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Total	**3943**	**704**	**1452**	**229**	**3943**	**704**	**1452**	**229**
Cardiac catheterisation, No. (%)								
Yes	820 (21)	120 (17)	372 (26)	53 (23)	321 (21)	58 (23)	1513 (22)	231 (19)
No	2994 (76)	568 (81)	1026 (71)	165 (72)	1145 (74)	189 (74)	5165 (74)	922 (78)
Number transferred to another centre	129 (3)	16 (2)	54 (4)	11 (5)	80 (5)	9 (4)	263 (4)	36 (3)
Percutaneous Coronary Intervention, No. (%)								
Yes	749 (19)	107 (15)	298 (21)	43 (19)	231 (15)	44 (17)	1278 (18)	194 (16)
No	3194 (81)	597 (85)	1154 (79)	186 (81)	1315 (85)	212 (83)	5663 (82)	995 (84)
CABG, No. (%)								
Yes	25 (1)	3 (0)	4 (0)	0 (0)	5 (0)	1 (0)	34 (0)	4 (0)
No	3918 (99)	701 (100)	1448 (100)	229 (100)	1541 (100)	255 (100)	6907 (100)	1185 (100)
Pre-admission aspirin use, No. (%)								
Yes	726 (18)	154 (22)	324 (22)	59 (26)	303 (20)	60 (23)	1353 (19)	273 (23)
No	2835 (72)	468 (66)	1058 (73)	160 (70)	1162 (75)	188 (73)	5055 (73)	816 (69)
Unknown	382 (10)	82 (12)	70 (5)	10 (4)	81 (5)	8 (3)	533 (8)	100 (8)

Year	2006-2008		2009		2010		2006-2010	
Gender	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Total	**3943**	**704**	**1452**	**229**	**3943**	**704**	**1452**	**229**
Pharmacological therapy given during admission, No. (%)								
Aspirin	3676 (93)	642 (91)	1364 (94)	214 (93)	1459 (94)	244 (95)	6499 (94)	1100 (93)
ADP antagonist	2663 (68)	491 (70)	1134 (78)	175 (76)	1217 (79)	194 (76)	5014 (72)	860 (72)
GP receptor inhibitor	143 (4)	22 (3)	75 (5)	11 (5)	52 (3)	9 (4)	270 (4)	42 (4)
Unfractionated heparin	406 (10)	69 (10)	129 (9)	25 (11)	205 (13)	39 (15)	740 (11)	133 (11)
LMWH	1310 (33)	288 (41)	613 (42)	101 (44)	649 (42)	114 (45)	2572 (37)	503 (42)
Beta blocker	2533 (64)	424 (60)	885 (61)	127 (55)	875 (57)	146 (57)	4293 (62)	697 (59)
ACE inhibitor	2268 (58)	368 (52)	792 (55)	117 (51)	798 (52)	122 (48)	3858 (56)	607 (51)
Angiotensin II receptor blocker	178 (5)	43 (6)	95 (7)	21 (9)	92 (6)	22 (9)	365 (5)	86 (7)
Statin	3552 (90)	614 (87)	1271 (88)	197 (86)	1398 (90)	227 (89)	6221 (90)	1038 (87)
Other lipid lowering agent	163 (4)	27 (4)	118 (8)	24 (10)	65 (4)	11 (4)	346 (5)	62 (5)
Diuretics	944 (24)	243 (35)	257 (18)	68 (30)	321 (21)	84 (33)	1522 (22)	395 (33)
Calcium antagonist	258 (7)	60 (9)	90 (6)	19 (8)	70 (5)	24 (9)	418 (6)	103 (9)
Oral hypoglycaemic agent	843 (21)	210 (30)	290 (20)	66 (29)	318 (21)	61 (24)	1451 (21)	337 (28)
Insulin	860 (22)	294 (42)	285 (20)	64 (28)	338 (22)	97 (38)	1483 (21)	455 (38)
Anti-arrhythmic agent	295 (7)	64 (9)	65 (4)	13 (6)	118 (8)	31 (12)	478 (7)	108 (9)

**Total admission days is derived as Outcome date – Admission date + 1*
***'Not given-Others' includes missing and refusal*
Note: Percentage is to the nearest decimal point

Table 4.4 Treatments for patients with STEMI by ethnic group, NCVD-ACS Registry, 2006-2010

Year	2006-2008				2009				2010				2006-2010			
Ethnic group	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***
Total	**2515**	**958**	**874**	**300**	**932**	**318**	**331**	**100**	**1019**	**338**	**297**	**148**	**4466**	**1614**	**1502**	**548**
Total admission days**																
N	2387	903	829	241	892	303	316	91	904	275	255	102	4183	1481	1400	434
Mean (SD)	6 (3)	6 (3)	6 (3)	6 (4)	6 (3)	5 (3)	6 (3)	6 (2)	6 (4)	6 (4)	6 (3)	6 (3)	6 (3)	6 (3)	6 (3)	6 (3)
Median (min, max)	5 (1, 30)	5 (1, 28)	5 (1, 29)	5 (1, 27)	5 (1, 30)	5 (1, 25)	5 (1, 29)	5 (2, 15)	5 (1, 30)	5 (1, 28)	5 (1, 30)	5 (1, 20)	5 (1, 30)	5 (1, 28)	5 (1, 30)	5 (1, 27)
IQR	2	2	2	2	2	2	2	2	2	3	1	2	3	2	1	2
Number of days on CCU																
N	1923	680	552	204	690	233	222	75	726	220	172	105	3339	1133	946	384
Mean (SD)	3 (3)	3 (2)	4 (3)	3 (3)	3 (2)	3 (3)	3 (2)	3 (2)	3 (3)	4 (2)	3 (2)	4 (2)	3 (3)	3 (2)	3 (3)	3 (2)
Median (min, max)	3 (1, 28)	3 (1, 17)	3 (1, 29)	3 (1, 28)	3 (1, 14)	3 (1, 24)	3 (1, 21)	3 (1, 11)	3 (1, 30)	3 (1, 14)	3 (1, 14)	3 (1, 20)	3 (1, 30)	3 (1, 24)	3 (1, 29)	3 (1, 28)
IQR	2	2	2	2	2	2	2	2	2	2	2	3	2	2	2	2
Number of days on ICU/CICU																
N	57	27	7	17	17	5	12	2	14	4	3	2	88	36	22	21
Mean (SD)	4 (4)	3 (3)	3 (1)	2 (1)	4 (2)	2 (0)	3 (1)	10 (6)	3 (1)	2 (1)	1 (1)	3 (0)	4 (3)	3 (3)	3 (1)	3 (3)
Median (min, max)	3 (1, 17)	2 (1, 13)	2 (1, 5)	2 (1, 4)	2 (2, 9)	2 (2, 3)	3 (2, 4)	10 (6, 14)	3 (1, 5)	3 (1, 3)	1 (1, 2)	3 (3, 3)	3 (1, 17)	2 (1, 13)	2 (1, 5)	2 (1, 14)
IQR	3	3	2	1	2	0	2	8	2	2	1	0	3	2	2	1

Year	2006-2008				2009				2010				2006-2010			
Ethnic group	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***
Total	**2515**	**958**	**874**	**300**	**932**	**318**	**331**	**100**	**1019**	**338**	**297**	**148**	**4466**	**1614**	**1502**	**548**
Fibrinolytic therapy, No. (%)	1906 (76)	637 (66)	623 (71)	211 (70)	726 (78)	214 (67)	246 (74)	72 (72)	773 (76)	238 (70)	215 (72)	121 (82)	3405 (76)	1089 (67)	1084 (72)	404 (74)
Given	135 (5)	88 (9)	72 (8)	24 (8)	43 (5)	21 (7)	19 (6)	7 (7)	77 (8)	32 (9)	28 (9)	3 (2)	255 (6)	141 (9)	119 (8)	34 (6)
Not given-proceeded directly to primary angioplasty	97 (4)	46 (5)	25 (3)	20 (7)	42 (5)	19 (6)	11 (3)	10 (10)	33 (3)	18 (5)	7 (2)	6 (4)	172 (4)	83 (5)	43 (3)	36 (7)
Not given-Contraindicated	289 (11)	145 (15)	122 (14)	31 (10)	97 (10)	49 (15)	46 (14)	9 (9)	112 (11)	37 (11)	39 (13)	14 (9)	498 (11)	231 (14)	207 (14)	54 (10)
Not given-Missed thrombolysis	88 (3)	42 (4)	32 (4)	14 (5)	24 (3)	15 (5)	9 (3)	2 (2)	24 (2)	13 (4)	8 (3)	4 (3)	136 (3)	70 (4)	49 (3)	20 (4)
Not given-Others***	1906 (76)	637 (66)	623 (71)	211 (70)	726 (78)	214 (67)	246 (74)	72 (72)	773 (76)	238 (70)	215 (72)	121 (82)	3405 (76)	1089 (67)	1084 (72)	404 (74)
Cardiac catheterisation, No. (%)																
Yes	437 (17)	239 (25)	196 (22)	68 (23)	194 (21)	104 (33)	104 (31)	23 (23)	216 (21)	81 (24)	72 (24)	10 (7)	847 (19)	424 (26)	372 (25)	101 (18)
No	2004 (80)	691 (72)	656 (75)	211 (70)	705 (76)	208 (65)	213 (64)	65 (65)	763 (75)	234 (69)	213 (72)	124 (84)	3472 (78)	1133 (70)	1082 (72)	400 (73)
Number transferred to another centre	74 (3)	28 (3)	22 (3)	21 (7)	33 (4)	6 (2)	14 (4)	12 (12)	40 (4)	23 (7)	12 (4)	14 (9)	147 (3)	57 (4)	48 (3)	47 (9)
Percutaneous Coronary Intervention, No. (%)																
Yes	389 (15)	217 (23)	194 (22)	56 (19)	145 (16)	93 (29)	84 (25)	19 (19)	137 (13)	68 (20)	58 (20)	12 (8)	671 (15)	378 (23)	336 (22)	87 (16)
No	2126 (85)	741 (77)	680 (78)	244 (81)	787 (84)	225 (71)	247 (75)	81 (81)	882 (87)	270 (80)	239 (80)	136 (92)	3795 (85)	1236 (77)	1166 (78)	461 (84)

Year	2006-2008				2009				2010				2006-2010			
Ethnic group	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***
Total	**2515**	**958**	**874**	**300**	**932**	**318**	**331**	**100**	**1019**	**338**	**297**	**148**	**4466**	**1614**	**1502**	**548**
CABG, No. (%)																
Yes	18 (1)	8 (1)	2 (0)	0 (0)	2 (0)	1 (0)	1 (0)	0 (0)	2 (0)	2 (1)	1 (0)	1 (1)	22 (0)	11 (1)	4 (0)	1 (0)
No	2497 (99)	950 (99)	872 (100)	300 (100)	930 (100)	317 (100)	330 (100)	100 (100)	1017 (100)	336 (99)	296 (100)	147 (99)	4444 (100)	1603 (99)	1498 (100)	547 (100)
Pre-admission aspirin use, No. (%)																
Yes	471 (19)	170 (18)	203 (23)	36 (12)	198 (21)	69 (22)	107 (32)	9 (9)	200 (20)	61 (18)	86 (29)	16 (11)	869 (19)	300 (19)	396 (26)	61 (11)
No	1820 (72)	691 (72)	567 (65)	225 (75)	684 (73)	237 (75)	211 (64)	86 (86)	773 (76)	263 (78)	186 (63)	128 (86)	3277 (73)	1191 (74)	964 (64)	439 (80)
Unknown	224 (9)	97 (10)	104 (12)	39 (13)	50 (5)	12 (4)	13 (4)	5 (5)	46 (5)	14 (4)	25 (8)	4 (3)	320 (7)	123 (8)	142 (9)	48 (9)
Pharmacological therapy given during admission, No. (%)																
Aspirin	2339 (93)	895 (93)	816 (93)	268 (89)	877 (94)	296 (93)	314 (95)	91 (91)	960 (94)	322 (95)	283 (95)	138 (93)	4176 (94)	1513 (94)	1413 (94)	497 (91)
ADP antagonist	1680 (67)	723 (75)	590 (68)	161 (54)	695 (75)	270 (85)	275 (83)	69 (69)	797 (78)	265 (78)	241 (81)	108 (73)	3172 (71)	1258 (78)	1106 (74)	338 (62)
GP receptor inhibitor	91 (4)	33 (3)	29 (3)	12 (4)	40 (4)	17 (5)	25 (8)	4 (4)	37 (4)	10 (3)	9 (3)	5 (3)	168 (4)	60 (4)	63 (4)	21 (4)
Unfractionated heparin	283 (11)	71 (7)	101 (12)	20 (7)	71 (8)	36 (11)	34 (10)	13 (13)	139 (14)	45 (13)	45 (15)	15 (10)	493 (11)	152 (9)	180 (12)	48 (9)
LMWH	795 (32)	327 (34)	351 (40)	125 (42)	357 (38)	136 (43)	149 (45)	72 (72)	385 (38)	147 (43)	138 (46)	93 (63)	1537 (34)	610 (38)	638 (42)	290 (53)
Beta blocker	1574 (63)	654 (68)	577 (66)	152 (51)	567 (61)	182 (57)	203 (61)	60 (60)	565 (55)	198 (59)	180 (61)	78 (53)	2706 (61)	1034 (64)	960 (64)	290 (53)

Year	2006-2008				2009				2010				2006-2010			
Ethnic group	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***
Total	**2515**	**958**	**874**	**300**	**932**	**318**	**331**	**100**	**1019**	**338**	**297**	**148**	**4466**	**1614**	**1502**	**548**
ACE inhibitor	1472 (59)	509 (53)	523 (60)	132 (44)	528 (57)	157 (49)	165 (50)	59 (59)	542 (53)	174 (51)	144 (48)	60 (41)	2542 (57)	840 (52)	832 (55)	251 (46)
Angiotensin II receptor blocker	107 (4)	52 (5)	45 (5)	17 (6)	62 (7)	16 (5)	33 (10)	5 (5)	59 (6)	20 (6)	29 (10)	6 (4)	228 (5)	88 (5)	107 (7)	28 (5)
Statin	2259 (90)	869 (91)	775 (89)	263 (88)	808 (87)	277 (87)	288 (87)	95 (95)	926 (91)	304 (90)	262 (88)	133 (90)	3993 (89)	1450 (90)	1325 (88)	491 (90)
Other lipid lowering agent	104 (4)	34 (4)	43 (5)	9 (3)	90 (10)	16 (5)	29 (9)	7 (7)	31 (3)	21 (6)	13 (4)	11 (7)	225 (5)	71 (4)	85 (6)	27 (5)
Diuretics	673 (27)	208 (22)	236 (27)	70 (23)	198 (21)	52 (16)	53 (16)	22 (22)	229 (22)	68 (20)	67 (23)	41 (28)	1100 (25)	328 (20)	356 (24)	133 (24)
Calcium antagonist	169 (7)	60 (6)	67 (8)	22 (7)	63 (7)	14 (4)	27 (8)	5 (5)	56 (5)	11 (3)	23 (8)	4 (3)	288 (6)	85 (5)	117 (8)	31 (6)
Oral hypoglycaemic agent	529 (21)	199 (21)	289 (33)	36 (12)	181 (19)	58 (18)	105 (32)	12 (12)	218 (21)	50 (15)	96 (32)	15 (10)	928 (21)	307 (19)	490 (33)	63 (11)
Insulin	604 (24)	205 (21)	300 (34)	45 (15)	200 (21)	49 (15)	90 (27)	10 (10)	255 (25)	63 (19)	98 (33)	19 (13)	1059 (24)	317 (20)	488 (32)	74 (14)
Anti-arrhythmic agent	181 (7)	84 (9)	63 (7)	31 (10)	42 (5)	13 (4)	11 (3)	12 (12)	80 (8)	26 (8)	29 (10)	14 (9)	303 (7)	123 (8)	103 (7)	57 (10)

**Total admission days is derived as Outcome date – Admission date + 1*
***'Not given-Others' includes missing and refusal*
Note: Percentage is to the nearest decimal point

Table 4.5 Door to needle and balloon time distribution for patients with STEMI by year, NCVD-ACS Registry, 2006-2010

ACS stratum	STEMI only					
	2006	**2007**	**2008**	**2009**	**2010**	**2006-2010**
Door to needle time, min						
N	745	827	794	832	921	4119
Mean (SD)	103 (143)	91 (131)	112 (195)	100 (186)	119 (217)	105 (179)
Median (min, max)	60 (2, 1349)	53 (1, 1435)	50 (1, 1440)	45 (2, 1440)	45 (3, 1440)	50 (1, 1440)
IQR	90	70	72	68	73	75
Door to balloon time, min						
N	151	126	99	134	123	633
Mean (SD)	237 (292)	215 (266)	214 (260)	265 (338)	192 (224)	226 (281)
Median (min, max)	133 (35, 1440)	112 (25, 1410)	114 (11, 1195)	119 (24, 1391)	108 (13, 1410)	117 (11, 1440)
IQR	135	154	139	186	134	153

Table 4.6 Treatments for patients with NSTEMI/UA by age group (years), NCVD-ACS Registry, 2006-2010

Year	2006-2008			2009			2010			2006-2010		
Age group*	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**
Total	**172**	**2238**	**2814**	**58**	**798**	**1057**	**66**	**683**	**850**	**296**	**3719**	**4721**
Total admission days**												
N	163	2141	2667	58	784	1020	59	623	753	280	3548	4440
Mean (SD)	5 (2)	5 (4)	6 (4)	5 (3)	5 (3)	6 (4)	5 (4)	5 (3)	5 (4)	5 (3)	5 (3)	6 (4)
Median (min, max)	4 (2, 17)	4 (1, 30)	5 (1, 30)	4 (1, 13)	4 (1, 28)	4 (1, 30)	4 (2, 26)	4 (1, 24)	4 (1, 30)	4 (1, 26)	4 (1, 30)	5 (1, 30)
IQR	2	3	3	2	3	4	3	2	4	2	3	4
Number of days on CCU												
N	49	604	802	25	364	472	15	132	190	89	1100	1464
Mean (SD)	2 (2)	3 (3)	4 (3)	3 (3)	3 (3)	4 (4)	4 (2)	3 (2)	4 (3)	3 (2)	3 (3)	4 (3)
Median (min, max)	2 (1, 10)	3 (1, 24)	3 (1, 30)	2 (1, 12)	3 (1, 26)	3 (1, 30)	4 (1, 8)	3 (1, 10)	3 (1, 16)	2 (1, 12)	3 (1, 26)	3 (1, 30)
IQR	2	3	2	3	2	3	4	2	3	3	2	2
Number of days on ICU/CICU												
N	3	81	111	0	9	19	1	10	8	4	100	138
Mean (SD)	2 (2)	3 (2)	4 (3)	.	2 (1)	5 (6)	1 (.)	3 (1)	4 (3)	2 (2)	3 (2)	4 (4)
Median (min, max)	1 (1, 4)	3 (1, 12)	3 (1, 24)	.	2 (1, 4)	3 (1, 24)	1 (1, 1)	3 (2, 4)	3 (1, 8)	1 (1, 4)	2 (1, 12)	3 (1, 24)
IQR	3	3	2	.	1	4	0	2	4	2	2	2

Year	2006-2008			2009			2010			2006-2010		
Age group*	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**
Total	**172**	**2238**	**2814**	**58**	**798**	**1057**	**66**	**683**	**850**	**296**	**3719**	**4721**
Cardiac catheterisation, No. (%)												
Yes	34 (20)	436 (19)	449 (16)	8 (14)	145 (18)	178 (17)	8 (12)	88 (13)	128 (15)	50 (17)	669 (18)	755 (16)
No	137 (80)	1762 (79)	2307 (82)	50 (86)	638 (80)	862 (82)	53 (80)	568 (83)	690 (81)	240 (81)	2968 (80)	3859 (82)
Number transferred to another centre	1 (1)	40 (2)	58 (2)	.	15 (2)	17 (2)	5 (8)	27 (4)	32 (4)	6 (2)	82 (2)	107 (2)
Percutaneous Coronary Intervention, No. (%)												
Yes	25 (15)	280 (13)	277 (10)	5 (9)	84 (11)	89 (8)	7 (11)	50 (7)	66 (8)	37 (13)	414 (11)	432 (9)
No	147 (85)	1958 (87)	2537 (90)	53 (91)	714 (89)	968 (92)	59 (89)	633 (93)	784 (92)	259 (88)	3305 (89)	4289 (91)
CABG, No. (%)												
Yes	1 (1)	44 (2)	67 (2)	0 (0)	9 (1)	19 (2)	0 (0)	6 (1)	6 (1)	1 (0)	59 (2)	92 (2)
No	171 (99)	2194 (98)	2747 (98)	58 (100)	789 (99)	1038 (98)	66 (100)	677 (99)	844 (99)	295 (100)	3660 (98)	4629 (98)
Pre-admission aspirin use, No. (%)												
Yes	56 (33)	955 (43)	1382 (49)	18 (31)	398 (50)	580 (55)	24 (36)	314 (46)	413 (49)	98 (33)	1667 (45)	2375 (50)
No	84 (49)	976 (44)	1040 (37)	39 (67)	383 (48)	455 (43)	39 (59)	332 (49)	394 (46)	162 (55)	1691 (45)	1889 (40)
Unknown	32 (19)	307 (14)	392 (14)	1 (2)	17 (2)	22 (2)	3 (5)	37 (5)	43 (5)	36 (12)	361 (10)	457 (10)

Year	2006-2008			2009			2010			2006-2010		
Age group*	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**	**Young**	**Middle-age**	**Elderly**
Total	**172**	**2238**	**2814**	**58**	**798**	**1057**	**66**	**683**	**850**	**296**	**3719**	**4721**
Pharmacological therapy given during admission, No. (%)												
Aspirin	152 (88)	1992 (89)	2429 (86)	54 (93)	759 (95)	980 (93)	62 (94)	630 (92)	767 (90)	268 (91)	3381 (91)	4176 (88)
ADP antagonist	92 (53)	1258 (56)	1716 (61)	41 (71)	645 (81)	872 (82)	48 (73)	485 (71)	646 (76)	181 (61)	2388 (64)	3234 (69)
GP receptor inhibitor	5 (3)	55 (2)	68 (2)	1 (2)	11 (1)	13 (1)	2 (3)	16 (2)	25 (3)	8 (3)	82 (2)	106 (2)
Unfractionated heparin	27 (16)	339 (15)	329 (12)	4 (7)	41 (5)	71 (7)	4 (6)	56 (8)	67 (8)	35 (12)	436 (12)	467 (10)
LMWH	118 (69)	1537 (69)	1977 (70)	46 (79)	671 (84)	880 (83)	48 (73)	513 (75)	631 (74)	212 (72)	2721 (73)	3488 (74)
Beta blocker	114 (66)	1533 (68)	1815 (64)	38 (66)	536 (67)	707 (67)	34 (52)	439 (64)	510 (60)	186 (63)	2508 (67)	3032 (64)
ACE inhibitor	99 (58)	1322 (59)	1546 (55)	31 (53)	533 (67)	627 (59)	32 (48)	377 (55)	423 (50)	162 (55)	2232 (60)	2596 (55)
Angiotensin II receptor blocker	9 (5)	180 (8)	321 (11)	6 (10)	65 (8)	135 (13)	5 (8)	62 (9)	124 (15)	20 (7)	307 (8)	580 (12)
Statin	148 (86)	1980 (88)	2426 (86)	51 (88)	672 (84)	902 (85)	58 (88)	602 (88)	749 (88)	257 (87)	3254 (87)	4077 (86)
Other lipid lowering agent	13 (8)	142 (6)	166 (6)	7 (12)	54 (7)	74 (7)	5 (8)	36 (5)	58 (7)	25 (8)	232 (6)	298 (6)
Diuretics	34 (20)	597 (27)	1149 (41)	10 (17)	172 (22)	394 (37)	15 (23)	190 (28)	354 (42)	59 (20)	959 (26)	1897 (40)
Calcium antagonist	22 (13)	373 (17)	720 (26)	4 (7)	129 (16)	215 (20)	11 (17)	118 (17)	237 (28)	37 (13)	620 (17)	1172 (25)
Oral hypoglycaemic agent	35 (20)	653 (29)	856 (30)	12 (21)	284 (36)	308 (29)	10 (15)	204 (30)	250 (29)	57 (19)	1141 (31)	1414 (30)
Insulin	23 (13)	527 (24)	701 (25)	5 (9)	183 (23)	224 (21)	10 (15)	166 (24)	218 (26)	38 (13)	876 (24)	1143 (24)
Anti-arrhythmic agent	6 (3)	106 (5)	212 (8)	1 (2)	33 (4)	84 (8)	2 (3)	27 (4)	67 (8)	9 (3)	166 (4)	363 (8)

**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*
***Total admission days is derived as Outcome date – Admission date + 1*
Note: Percentage is to the nearest decimal point

Table 4.7 Treatments for patients with NSTEMI/UA by gender, NCVD-ACS Registry, 2006-2010

Year	2006-2008		2009		2010		2006-2010	
Gender	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Total	**3533**	**1691**	**1274**	**639**	**1075**	**524**	**5882**	**2854**
Total admission days*								
N	3375	1596	1243	619	962	473	5580	2688
Mean (SD)	6 (4)	6 (4)	5 (4)	5 (4)	5 (4)	5 (3)	6 (4)	6 (4)
Median (min, max)	4 (1, 30)	5 (1, 30)	4 (1, 30)	4 (1, 29)	4 (1, 30)	4 (1, 23)	4 (1, 30)	4 (1, 30)
IQR	2	2	3	3	3	3	3	3
Number of days on CCU								
N	1068	387	587	274	241	96	1896	757
Mean (SD)	3 (3)	4 (4)	4 (3)	4 (4)	3 (2)	4 (3)	3 (3)	4 (4)
Median (min, max)	3 (1, 24)	3 (1, 30)	3 (1, 28)	3 (1, 30)	3 (1, 16)	3 (1, 14)	3 (1, 28)	3 (1, 30)
IQR	3	3	2	3	2	3	2	3
Number of days on ICU/CICU								
N	142	53	26	2	12	7	180	62
Mean (SD)	3 (3)	4 (4)	4 (5)	2 (0)	2 (1)	4 (3)	3 (3)	4 (4)
Median (min, max)	2 (1, 24)	3 (1, 23)	3 (1, 24)	2 (2, 2)	2 (1, 4)	4 (1, 8)	2 (1, 24)	3 (1, 23)
IQR	3	3	3	0	1	5	3	3
Cardiac catheterisation, No. (%)								
Yes	679 (19)	240 (14)	260 (20)	71 (11)	164 (15)	60 (11)	1103 (19)	371 (13)
No	2790 (79)	1416 (84)	990 (78)	560 (88)	866 (81)	445 (85)	4646 (79)	2421 (85)
Number transferred to another centre	64 (2)	35 (2)	24 (2)	8 (1)	45 (4)	19 (4)	133 (2)	62 (2)

Year	2006-2008		2009		2010		2006-2010	
Gender	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Total	**3533**	**1691**	**1274**	**639**	**1075**	**524**	**5882**	**2854**
Percutaneous Coronary Intervention, No. (%)								
Yes	433 (12)	149 (9)	139 (11)	39 (6)	93 (9)	30 (6)	665 (11)	218 (8)
No	3100 (88)	1542 (91)	1135 (89)	600 (94)	982 (91)	494 (94)	5217 (89)	2636 (92)
CABG, No. (%)								
Yes	87 (2)	25 (1)	25 (2)	3 (0)	10 (1)	2 (0)	122 (2)	30 (1)
No	3446 (98)	1666 (99)	1249 (98)	636 (100)	1065 (99)	522 (100)	5760 (98)	2824 (99)
Pre-admission aspirin use, No. (%)								
Yes	1651 (47)	742 (44)	673 (53)	323 (51)	528 (49)	223 (43)	2852 (48)	1288 (45)
No	1376 (39)	724 (43)	577 (45)	300 (47)	494 (46)	271 (52)	2447 (42)	1295 (45)
Unknown	506 (14)	225 (13)	24 (2)	16 (3)	53 (5)	30 (6)	583 (10)	271 (9)
Pharmacological therapy given during admission, No. (%)								
Aspirin	3131 (89)	1442 (85)	1201 (94)	592 (93)	992 (92)	467 (89)	5324 (91)	2501 (88)
ADP antagonist	2132 (60)	934 (55)	1055 (83)	503 (79)	804 (75)	375 (72)	3991 (68)	1812 (63)
GP receptor inhibitor	94 (3)	34 (2)	19 (1)	6 (1)	28 (3)	15 (3)	141 (2)	55 (2)
Unfractionated heparin	483 (14)	212 (13)	81 (6)	35 (5)	87 (8)	40 (8)	651 (11)	287 (10)
LMWH	2430 (69)	1202 (71)	1045 (82)	552 (86)	799 (74)	393 (75)	4274 (73)	2147 (75)
Beta blocker	2379 (67)	1083 (64)	864 (68)	417 (65)	670 (62)	313 (60)	3913 (67)	1813 (64)
ACE inhibitor	2072 (59)	895 (53)	810 (64)	381 (60)	572 (53)	260 (50)	3454 (59)	1536 (54)
Angiotensin II receptor blocker	307 (9)	203 (12)	136 (11)	70 (11)	116 (11)	75 (14)	559 (10)	348 (12)

Year	2006-2008		2009		2010		2006-2010	
Gender	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**	**Male**	**Female**
Total	**3533**	**1691**	**1274**	**639**	**1075**	**524**	**5882**	**2854**
Statin	3089 (87)	1465 (87)	1081 (85)	544 (85)	953 (89)	456 (87)	5123 (87)	2465 (86)
Other lipid lowering agent	214 (6)	107 (6)	96 (8)	39 (6)	69 (6)	30 (6)	379 (6)	176 (6)
Diuretics	1120 (32)	660 (39)	355 (28)	221 (35)	359 (33)	200 (38)	1834 (31)	1081 (38)
Calcium antagonist	656 (19)	459 (27)	208 (16)	140 (22)	223 (21)	143 (27)	1087 (18)	742 (26)
Oral hypoglycaemic agent	946 (27)	598 (35)	382 (30)	222 (35)	302 (28)	162 (31)	1630 (28)	982 (34)
Insulin	751 (21)	500 (30)	240 (19)	172 (27)	253 (24)	141 (27)	1244 (21)	813 (28)
Anti-arrhythmic agent	217 (6)	107 (6)	76 (6)	42 (7)	62 (6)	34 (6)	355 (6)	183 (6)

**Total admission days is derived as Outcome date – Admission date + 1*
Note: Percentage is to the nearest decimal point

Table 4.8 Treatments for patients with NSTEMI/UA by ethnic group, NCVD-ACS Registry, 2006-2010

Year	2006-2008				2009				2010				2006-2010			
Ethnic group	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***
Total	**2304**	**1337**	**1367**	**216**	**855**	**446**	**535**	**77**	**693**	**359**	**483**	**64**	**3852**	**2142**	**2385**	**357**
Total admission days**																
N	2198	1279	1304	190	838	432	519	73	627	316	443	49	3663	2027	2266	312
Mean (SD)	6 (4)	6 (4)	5 (4)	6 (4)	6 (4)	5 (3)	5 (4)	6 (5)	5 (4)	5 (2)	5 (3)	5 (3)	6 (4)	5 (4)	5 (4)	6 (4)
Median (min, max)	5 (1, 30)	4 (1, 30)	4 (1, 30)	4 (2, 22)	4 (1, 30)	4 (1, 28)	4 (1, 24)	4 (2, 30)	4 (1, 30)	4 (1, 19)	4 (1, 24)	4 (1, 13)	4 (1, 30)	4 (1, 30)	4 (1, 30)	4 (1, 30)
IQR	2	3	2	2	3	3	3	4	4	3	3	3	3	3	3	4
Number of days on CCU																
N	728	378	234	115	369	189	248	55	188	61	73	15	1285	628	555	185
Mean (SD)	3 (3)	3 (3)	4 (3)	3 (2)	4 (4)	3 (3)	4 (3)	3 (3)	3 (2)	3 (2)	4 (3)	3 (2)	4 (3)	3 (3)	4 (3)	3 (2)
Median (min, max)	3 (1, 30)	2 (1, 24)	3 (1, 21)	2 (1, 14)	3 (1, 28)	2 (1, 21)	3 (1, 30)	3 (1, 12)	3 (1, 14)	3 (1, 10)	3 (1, 16)	3 (1, 7)	3 (1, 30)	2 (1, 24)	3 (1, 30)	3 (1, 14)
IQR	2	3	3	3	3	2	2	3	3	2	3	2	2	3	3	3
Number of days on ICU/CICU																
N	89	60	20	26	13	4	5	6	12	2	3	2	114	66	28	34
Mean (SD)	4 (4)	3 (2)	4 (3)	3 (2)	4 (6)	4 (3)	3 (2)	5 (7)	3 (2)	2 (1)	4 (4)	3 (1)	4 (4)	3 (2)	3 (3)	3 (3)
Median (min, max)	3 (1, 24)	3 (1, 11)	3 (1, 12)	2 (1, 10)	2 (1, 24)	3 (1, 7)	3 (1, 5)	2 (1, 19)	3 (1, 7)	2 (1, 3)	2 (1, 8)	3 (2, 4)	3 (1, 24)	3 (1, 11)	3 (1, 12)	2 (1, 19)
IQR	2	3	4	1	2	3	3	3	2	2	7	2	2	3	4	2

Year	2006-2008				2009				2010				2006-2010			
Ethnic group	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***
Total	**2304**	**1337**	**1367**	**216**	**855**	**446**	**535**	**77**	**693**	**359**	**483**	**64**	**3852**	**2142**	**2385**	**357**
Cardiac catheterisation, No. (%)																
Yes	387 (17)	221 (17)	252 (18)	59 (27)	153 (18)	60 (13)	103 (19)	15 (19)	104 (15)	36 (10)	73 (15)	11 (17)	644 (17)	317 (15)	428 (18)	85 (24)
No	1862 (81)	1091 (82)	1098 (80)	155 (72)	690 (81)	375 (84)	425 (79)	60 (78)	560 (81)	306 (85)	396 (82)	49 (77)	3112 (81)	1772 (83)	1919 (80)	264 (74)
Number transferred to another centre	55 (2)	25 (2)	17 (1)	2 (1)	12 (1)	11 (2)	7 (1)	2 (3)	29 (4)	17 (5)	14 (3)	4 (6)	96 (2)	53 (2)	38 (2)	8 (2)
Percutaneous Coronary Intervention, No. (%)																
Yes	240 (10)	142 (11)	166 (12)	34 (16)	73 (9)	33 (7)	65 (12)	7 (9)	50 (7)	16 (4)	49 (10)	8 (13)	363 (9)	191 (9)	280 (12)	49 (14)
No	2064 (90)	1195 (89)	1201 (88)	182 (84)	782 (91)	413 (93)	470 (88)	70 (91)	643 (93)	343 (96)	434 (90)	56 (88)	3489 (91)	1951 (91)	2105 (88)	308 (86)
CABG, No. (%)																
Yes	58 (3)	30 (2)	15 (1)	9 (4)	17 (2)	3 (1)	3 (1)	5 (6)	8 (1)	2 (1)	2 (0)	0 (0)	83 (2)	35 (2)	20 (1)	14 (4)
No	2246 (97)	1307 (98)	1352 (99)	207 (96)	838 (98)	443 (99)	532 (99)	72 (94)	685 (99)	357 (99)	481 (100)	64 (100)	3769 (98)	2107 (98)	2365 (99)	343 (96)
Pre-admission aspirin use, No. (%)																
Yes	1068 (46)	568 (42)	688 (50)	69 (32)	460 (54)	224 (50)	283 (53)	29 (38)	324 (47)	155 (43)	244 (51)	28 (44)	1852 (48)	947 (44)	1215 (51)	126 (35)
No	954 (41)	584 (44)	442 (32)	120 (56)	377 (44)	213 (48)	244 (46)	43 (56)	335 (48)	189 (53)	213 (44)	28 (44)	1666 (43)	986 (46)	899 (38)	191 (54)
Unknown	282 (12)	185 (14)	237 (17)	27 (13)	18 (2)	9 (2)	8 (1)	5 (6)	34 (5)	15 (4)	26 (5)	8 (13)	334 (9)	209 (10)	271 (11)	40 (11)

Year	2006-2008				2009				2010				2006-2010			
Ethnic group	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***	**Malay**	**Chinese**	**Indian**	**Others***
Total	**2304**	**1337**	**1367**	**216**	**855**	**446**	**535**	**77**	**693**	**359**	**483**	**64**	**3852**	**2142**	**2385**	**357**
Pharmacological therapy given during admission, No. (%)																
Aspirin	2026 (88)	1177 (88)	1175 (86)	195 (90)	803 (94)	411 (92)	511 (96)	68 (88)	641 (92)	324 (90)	438 (91)	56 (88)	3470 (90)	1912 (89)	2124 (89)	319 (89)
ADP antagonist	1258 (55)	859 (64)	814 (60)	135 (63)	651 (76)	384 (86)	463 (87)	60 (78)	499 (72)	277 (77)	364 (75)	39 (61)	2408 (63)	1520 (71)	1641 (69)	234 (66)
GP receptor inhibitor	48 (2)	40 (3)	34 (2)	6 (3)	9 (1)	10 (2)	5 (1)	1 (1)	20 (3)	9 (3)	13 (3)	1 (2)	77 (2)	59 (3)	52 (2)	8 (2)
Unfractionated heparin	472 (20)	82 (6)	129 (9)	12 (6)	66 (8)	25 (6)	16 (3)	9 (12)	65 (9)	20 (6)	34 (7)	8 (13)	603 (16)	127 (6)	179 (8)	29 (8)
LMWH	1436 (62)	1022 (76)	1018 (74)	156 (72)	678 (79)	392 (88)	469 (88)	58 (75)	489 (71)	285 (79)	373 (77)	45 (70)	2603 (68)	1699 (79)	1860 (78)	259 (73)
Beta blocker	1484 (64)	934 (70)	900 (66)	144 (67)	586 (69)	288 (65)	353 (66)	54 (70)	425 (61)	216 (60)	307 (64)	35 (55)	2495 (65)	1438 (67)	1560 (65)	233 (65)
ACE inhibitor	1356 (59)	729 (55)	777 (57)	105 (49)	542 (63)	284 (64)	329 (61)	36 (47)	363 (52)	170 (47)	271 (56)	28 (44)	2261 (59)	1183 (55)	1377 (58)	169 (47)
Angiotensin II receptor blocker	197 (9)	139 (10)	152 (11)	22 (10)	95 (11)	34 (8)	65 (12)	12 (16)	79 (11)	42 (12)	62 (13)	8 (13)	371 (10)	215 (10)	279 (12)	42 (12)
Statin	1995 (87)	1181 (88)	1186 (87)	192 (89)	730 (85)	377 (85)	451 (84)	67 (87)	619 (89)	310 (86)	428 (89)	52 (81)	3344 (87)	1868 (87)	2065 (87)	311 (87)
Other lipid lowering agent	148 (6)	85 (6)	79 (6)	9 (4)	56 (7)	29 (7)	43 (8)	7 (9)	43 (6)	21 (6)	27 (6)	8 (13)	247 (6)	135 (6)	149 (6)	24 (7)
Diuretics	825 (36)	437 (33)	450 (33)	68 (31)	281 (33)	114 (26)	151 (28)	30 (39)	267 (39)	116 (32)	163 (34)	13 (20)	1373 (36)	667 (31)	764 (32)	111 (31)
Calcium antagonist	487 (21)	266 (20)	321 (23)	41 (19)	161 (19)	80 (18)	90 (17)	17 (22)	146 (21)	80 (22)	130 (27)	10 (16)	794 (21)	426 (20)	541 (23)	68 (19)
Oral hypoglycaemic agent	594 (26)	354 (26)	550 (40)	46 (21)	257 (30)	124 (28)	202 (38)	21 (27)	188 (27)	78 (22)	185 (38)	13 (20)	1039 (27)	556 (26)	937 (39)	80 (22)
Insulin	500 (22)	273 (20)	441 (32)	37 (17)	196 (23)	65 (15)	142 (27)	9 (12)	153 (22)	70 (19)	161 (33)	10 (16)	849 (22)	408 (19)	744 (31)	56 (16)
Anti-arrhythmic agent	144 (6)	89 (7)	69 (5)	22 (10)	59 (7)	29 (7)	19 (4)	11 (14)	49 (7)	24 (7)	21 (4)	2 (3)	252 (7)	142 (7)	109 (5)	35 (10)

Table 4.9 Treatments for patients with ACS by type of participating centres, NCVD-ACS Registry, 2006-2010

	2006						2007						2008					
	STEMI		NSTEMI		UA		STEMI		NSTEMI		UA		STEMI		NSTEMI		UA	
	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre
N	896	531	827	325	602	211	868	819	650	413	616	274	792	741	472	217	431	186
Fibrinolytic therapy, No. (%)																		
Given	614 (69)	391 (74)					573 (66)	657 (80)					513 (65)	629 (85)				
Not given – proceeded directly to primary angioplasty	109 (12)	7 (1)					109 (13)	4 (0)					87 (11)	3 (0)				
Not given – Contraindicated	35 (4)	34 (6)					31 (4)	32 (4)					26 (3)	30 (4)				
Not given – Missed thrombolysis	109 (12)	83 (16)					132 (15)	95 (12)					107 (14)	61 (8)				
Not given – Others*	29 (3)	16 (3)					23 (3)	31 (4)					59 (7)	18 (2)				
Percutaneous Coronary Intervention, No. (%)																		
Yes	303 (34)	0 (0)	162 (20)	0 (0)	73 (12)	0 (0)	296 (34)	0 (0)	164 (25)	0 (0)	73 (12)	0 (0)	257 (32)	0 (0)	89 (19)	0 (0)	21 (5)	0 (0)
No	593 (66)	531 (100)	665 (80)	325 (100)	529 (88)	211 (100)	572 (66)	819 (100)	486 (75)	413 (100)	543 (88)	274 (100)	535 (68)	741 (100)	383 (81)	217 (100)	410 (95)	186 (100)
CABG, No. (%)																		
Yes	10 (1)	0 (0)	42 (5)	0 (0)	15 (2)	0 (0)	10 (1)	0 (0)	28 (4)	0 (0)	9 (1)	0 (0)	8 (1)	0 (0)	13 (3)	0 (0)	5 (1)	0 (0)
No	886 (99)	531 (100)	785 (95)	325 (100)	587 (98)	211 (100)	858 (99)	819 (100)	622 (96)	413 (100)	607 (99)	274 (100)	784 (99)	741 (100)	459 (97)	217 (100)	426 (99)	186 (100)

	2009						2010						2006-2010					
	STEMI		NSTEMI		UA		STEMI		NSTEMI		UA		STEMI		NSTEMI		UA	
	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre	Cardiologist centre	Physician centre
N	**1151**	**530**	**899**	**147**	**802**	**65**	**1054**	**748**	**738**	**270**	**451**	**140**	**4761**	**3369**	**3586**	**1372**	**2902**	**876**
Fibrinolytic therapy, No. (%)																		
Given	800 (70)	458 (86)					689 (65)	658 (88)					3189 (67)	2793 (83)				
Not given – proceeded directly to primary angioplasty	88 (8)	2 (0)					140 (13)	0 (0)					533 (11)	16 (0)				
Not given – Contraindicated	60 (5)	22 (4)					46 (4)	18 (2)					198 (4)	136 (4)				
Not given – Missed thrombolysis	168 (15)	33 (6)					145 (14)	57 (8)					661 (14)	329 (10)				
Not given – Others*	35 (3)	15 (3)					34 (3)	15 (2)					180 (4)	95 (3)				
Percutaneous Coronary Intervention, No. (%)																		
Yes	341 (30)	0 (0)	142 (16)	0 (0)	35 (4)	0 (0)	273 (26)	0 (0)	100 (14)	0 (0)	22 (5)	0 (0)	1470 (31)	0 (0)	657 (18)	0 (0)	224 (8)	0 (0)
No	810 (70)	530 (100)	757 (84)	147 (100)	767 (96)	65 (100)	781 (74)	748 (100)	638 (86)	270 (100)	429 (95)	140 (100)	3291 (69)	3369 (100)	2929 (82)	1372 (100)	2678 (92)	876 (100)
CABG, No. (%)																		
Yes	4 (0)	0 (0)	19 (2)	0 (0)	9 (1)	0 (0)	5 (0)	0 (0)	6 (1)	0 (0)	4 (1)	0 (0)	37 (1)	0 (0)	108 (3)	2 (0)	42 (1)	0 (0)
No	1147 (100)	530 (100)	880 (98)	147 (100)	793 (99)	65 (100)	1049 (100)	748 (100)	732 (99)	270 (100)	447 (99)	140 (100)	4724 (99)	3369 (100)	3478 (97)	1370 (100)	2860 (99)	876 (100)

CHAPTER 5 :
OUTCOME

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CHAPTER 5: OUTCOME

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Summary

1. The in-hospital mortality rates of ACS patients remained consistent between six to eight percent over the five-year period from 2006 to 2010, with overall average of seven percent.

2. The in-hospital mortality rates for STEMI (9%) and NSTEMI (8%) were higher compared to several other global and regional ACS registries.

Overall in-hospital and 30-day outcome

Over the period of five years, in-hospital mortality rate remained consistent between six to eight percent for the entire ACS cohort. Similarly, the mortality rate at 30-day follow-up remained consistent between 10 to 11%. [Table 5.1] The in-hospital mortality rate was highest in STEMI (8-10%), slightly lower in NSTEMI (6-9%), and lowest in UA (1-3%). At 30-day follow-up, the mortality rates were similar for both STEMI and NSTEMI (12% in average), and the rate was lowest in UA (3-6%). For STEMI, the mortality rates appeared to be lower in the last two years of registry period (2009-2010), which were eight percent for in-hospital mortality and 11% for 30-day follow-up. However, there was no obvious change for NSTEMI patients. [Table 5.8]

The mortality rate of our patients was higher than the mortality rates in several other global and regional ACS registries within the similar period. The expanded Global Registry of Acute Coronary Events (GRACE 2)[1] from 2001 to 2007 reported in-hospital mortality rate of 6.2% in STEMI, 2.9% in NSTEMI and 1.7% in unstable angina patients. The Gulf Registry of Acute Coronary Events (Gulf Race) conducted in 2006 reported in-hospital mortality rate of just three percent for the entire registry cohort[2]. French Registry on Acute ST-elevation and Non ST-elevation myocardial infarction 2010 (FAST-MI 2010) reported in-hospital mortality rate of 4.5% for STEMI, 1.9% for NSTEMI and average of 3.4%.[3]

Outcome by patient characteristics

The mortality rates according to the patients' demographics and pre-morbid medical conditions remained consistent during the registry period. Higher mortality rate was observed in the elderly, female patients, patients with pre-morbid diabetes mellitus and hypertension, and patients without pre-morbid dyslipidaemia. [Table 5.2, 5.3, 5.4, 5.5 & 5.6]

Outcome of STEMI patients by treatment

Patients who received fibrinolytic therapy had lower in-hospital (7% vs. 13%) and 30-day (10% vs. 17%) mortality rates compared to those who did not receive the therapy. This was consistent throughout the five year period. [Table 5.9.1]

Due to the limitation of the availability and resources for PCI as treatment for STEMI during the same admission, the number of patients who received this therapy was small and remained similar in the five-year period. The mortality rate for those received PCI was slightly lower compared to those who did not receive, for both in-hospital (8% vs. 9%) and 30-day follow-up (10% vs. 12%). [Table 5.9.2] The survival benefit of PCI therapy was not as apparent as what was observed in fibrinolytic therapy. This was probably because PCI therapy was usually offered to or reserved to those patients who were at higher risk, e.g. patients in cardiogenic shock, whereas fibrinolytic therapy was usually given to majority of patients at presentation of STEMI.

Throughout the five-year period, the number of STEMI patients who had CABG during the same admission remained very small. There were only 35 patients in the whole period and three deaths (8%) had occurred, all during the hospitalization. [Table 5.9.3]

Outcome of NSTEMI/UA patients by treatment

In this group of patients, PCI therapy did improve the mortality rate. In-hospital mortality was four percent for those received PCI therapy compared to five percent for those who did not receive. The survival benefit was more obvious for 30-day follow-up (mortality rates of 6% vs. 9%). [Table 5.10.1]

Number of NSTEMI/UA patients who had CABG during the same admission was declining during the five year period. The mortality rate was higher in this group of patients compared to those who did not have CABG, for both in-hospital and 30-day follow-up. [Table 5.10.2] This was probably because those patients who required in-patient CABG after diagnostic coronary angiography were usually patients with more complex disease and at much higher risk.

References

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2. Zabaid M, Rashed WA, Al-Khaja N et al. Clinical presentations and outcomes of acute coronary syndromes in the Gulf registry of Acute Coronary Events (Gulf RACE). *Saudi Med J 2008;29(2):251-255.*

3. Hanssen M et al; FAST-MI 2010 investigators. French Registry on Acute ST-elevation and non ST-elevation Myocardial Infarction 2010. *Heart 2012;98:699-705*

Table 5.1 Outcomes for patients with ACS by year, NCVD-ACS Registry, 2006-2010

	+Outcome	Overall outcome			
		Outcome at discharge		30-day**	
		No.	%	No.	%
2006	Alive	3138	93	2862	84
	Death	254	7	530	16
2007	Alive	3327	91	3058	84
	Death	313	9	582	16
2008	Alive	2590	91	2401	85
	Death	249	9	438	15
2006 -2008	Alive	9055	92	8321	84
	Death	816	8	1550	16
2009	Alive	3328	93	3153	88
	Death	266	7	441	12
2010	Alive	3148	93	2955	87
	Death	253	7	446	13
2006 -2010	Alive	15531	92	14429	86
	Death	1335	8	2437	14

+ The outcome data is derived based on data matching with the National Death Register
**Includes patients who died in-hospital*

Table 5.2 Overall outcomes for patients with ACS by age group (years), NCVD-ACS Registry, 2006-2010

	+Outcome	In-hospital						30-day*					
		Young		Middle-age		Elderly		Young		Middle-age		Elderly	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
2006 - 2008	Alive	504	98	4563	95	3988	87	491	95	4359	91	3471	76
	Died	12	2	230	5	574	13	25	5	434	9	1091	24
2009	Alive	199	98	1630	95	1499	89	196	97	1583	93	1374	82
	Died	4	2	77	5	185	11	7	3	124	7	310	18
2010	Alive	203	96	1610	95	1335	89	199	94	1549	92	1207	80
	Died	9	4	79	5	165	11	13	6	140	8	293	20
2006 - 2010	Alive	906	97	7803	95	6822	88	886	95	7491	91	6052	78
	Died	25	3	386	5	924	12	45	5	698	9	1694	22

+ The outcome data is derived based on data matching with the National Death Register
**Includes patients who died in-hospital*
Note: Young is defined as age from 20 to less than 40 years, middle-aged is defined as age between 40 to less than 60 years and elderly is defined as 60 years and above

Table 5.3 Overall outcomes for patients with ACS by gender, NCVD-ACS Registry, 2006 - 2010

	+Outcome	In-hospital				30-day*			
		Male		Female		Male		Female	
		No.	%	No.	%	No.	%	No.	%
2006 - 2008	Alive	6900	92	2155	90	6422	86	1899	79
	Died	576	8	240	10	1054	14	496	21
2009	Alive	2535	93	793	91	2420	89	733	84
	Died	191	7	75	9	306	11	135	16
2010	Alive	2441	93	707	91	2315	88	640	82
	Died	180	7	73	9	306	12	140	18
2006 - 2010	Alive	11876	93	3655	90	11157	87	3272	81
	Died	947	7	388	10	1666	13	771	19

+ The outcome data is derived based on data matching with the National Death Register
**Includes patients who died in-hospital*

Table 5.4 Overall outcomes for patients with ACS by pre-morbid diabetes, NCVD-ACS Registry, 2006-2010

	+Outcome	In-hospital						30-day*					
		Yes		No		Not known		Yes		No		Unknown	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
2006 - 2008	Alive	3790	91	3677	93	1588	91	3386	81	3433	87	1502	86
	Died	383	9	268	7	165	9	787	19	512	13	251	14
2009	Alive	1437	92	1470	94	421	92	1334	85	1409	90	410	89
	Died	127	8	101	6	38	8	230	15	162	10	49	11
2010	Alive	1382	92	1343	94	423	92	1273	84	1273	89	409	89
	Died	126	8	91	6	36	8	235	16	161	11	50	11
2006 - 2010	Alive	6609	91	6490	93	2432	91	5993	83	6115	88	2321	87
	Died	636	9	460	7	239	9	1252	17	835	12	350	13

+ The outcome data is derived based on data matching with the National Death Register
**Includes patients who died in-hospital*

Table 5.5 Overall outcomes for patients with ACS by pre-morbid hypertension, NCVD-ACS Registry, 2006-2010

	+Outcome	In-hospital						30-day*					
		Yes		No		Not known		Yes		No		Unknown	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
2006 - 2008	Alive	5430	92	2298	93	1327	91	4902	83	2175	88	1244	85
	Died	503	8	181	7	132	9	1031	17	304	12	215	15
2009	Alive	2121	92	904	95	303	90	1979	86	877	92	297	88
	Died	181	8	50	5	35	10	323	14	77	8	41	12
2010	Alive	1919	92	904	94	325	91	1777	85	860	89	318	89
	Died	162	8	58	6	33	9	304	15	102	11	40	11
2006 - 2010	Alive	9470	92	4106	93	1955	91	8658	84	3912	89	1859	86
	Died	846	8	289	7	200	9	1658	16	483	11	296	14

+ The outcome data is derived based on data matching with the National Death Register
**Includes patients who died in-hospital*

Table 5.6 Overall outcomes for patients with ACS by pre-morbid dyslipidaemia, NCVD-ACS Registry, 2006-2010

	+Outcome	In-hospital						30-day*					
		Yes		No		Not known		Yes		No		Unknown	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
2006 - 2008	Alive	3053	93	2829	92	3173	90	2762	84	2621	85	2938	84
	Died	226	7	249	8	341	10	517	16	457	15	576	16
2009	Alive	1178	94	1466	92	684	90	1092	88	1404	89	657	86
	Died	70	6	120	8	76	10	156	13	182	11	103	14
2010	Alive	1024	94	1328	93	796	90	957	88	1244	87	754	85
	Died	66	6	101	7	86	10	133	12	185	13	128	15
2006 - 2010	Alive	5255	94	5623	92	4653	90	4811	86	5269	86	4349	84
	Died	362	6	470	8	503	10	806	14	824	14	807	16

+ The outcome data is derived based on data matching with the National Death Register
**Includes patients who died in-hospital*

Table 5.7 Overall outcomes for patients by types of centre, NCVD-ACS Registry, 2006-2010

	+Outcome	In-hospital				30-day*			
		Physician Centre		Cardiologist Centre		Physician Centre		Cardiologist Centre	
		No.	%	No.	%	No.	%	No.	%
2006 - 2008	Alive	3374	91	5681	92	3178	85	5143	84
	Died	343	9	473	8	539	15	1011	16
2009	Alive	703	95	2625	92	680	92	2473	87
	Died	39	5	227	8	62	8	379	13
2010	Alive	1086	94	2062	92	1047	90	1908	85
	Died	72	6	181	8	111	10	335	15
2006 - 2010	Alive	5163	92	10368	92	4905	87	9524	85
	Died	454	8	881	8	712	13	1725	15

+ The outcome data is derived based on data matching with the National Death Register
**Includes patients who died in-hospital*

Table 5.8 Overall outcomes for patients with ACS by ACS stratum, NCVD-ACS Registry, 2006-2010

	+Outcome	In-hospital						30-day*					
		STEMI		NSTEMI		UA		STEMI		NSTEMI		UA	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
2006 - 2008	Alive	4165	90	2645	91	2245	97	3946	85	2336	80	2039	88
	Died	482	10	259	9	75	3	701	15	568	20	281	12
2009	Alive	1526	91	953	91	849	98	1475	88	872	83	806	93
	Died	155	9	93	9	18	2	206	12	174	17	61	7
2010	Alive	1649	92	915	91	584	99	1590	88	812	81	553	94
	Died	153	8	93	9	7	1	212	12	196	19	38	6
2006 - 2010	Alive	7340	90	4513	91	3678	97	7011	86	4020	81	3398	90
	Died	790	10	445	9	100	3	1119	14	938	19	380	10

+ The outcome data is derived based on data matching with the National Death Register
**Includes patients who died in-hospital*

Table 5.9.1 Overall outcomes for patients with STEMI by fibrinolytic therapy, NCVD-ACS Registry, 2006-2010

	+Outcome	In-hospital				30-day*			
		Yes		No		Yes		No	
		No.	%	No.	%	No.	%	No.	%
2006 - 2008	Alive	3079	91	1086	86	2937	87	1009	79
	Died	298	9	184	14	440	13	261	21
2009	Alive	1163	92	363	86	1130	90	345	82
	Died	95	8	60	14	128	10	78	18
2010	Alive	1255	93	394	87	1213	90	377	83
	Died	92	7	61	13	134	10	78	17
2006 - 2010	Alive	5497	92	1843	86	5280	88	1731	81
	Died	485	8	305	14	702	12	417	19

+ The outcome data is derived based on data matching with the National Death Register
**Includes patients who died in-hospital*

Table 5.9.2 Overall outcomes for patients with STEMI by Percutaneous Coronary Intervention at admission, NCVD-ACS Registry, 2006-2010

	+Outcome	In-hospital				30-day*			
		Yes		No		Yes		No	
		No.	%	No.	%	No.	%	No.	%
2006 - 2008	Alive	773	90	3392	89	732	86	3214	85
	Died	83	10	399	11	124	14	577	15
2009	Alive	322	94	1204	90	316	93	1159	86
	Died	19	6	136	10	25	7	181	14
2010	Alive	252	92	1397	91	247	90	1343	88
	Died	23	8	130	9	28	10	184	12
2006 - 2010	Alive	1347	92	5993	90	1295	88	5716	86
	Died	125	8	665	10	177	12	942	14

+ The outcome data is derived based on data matching with the National Death Register
**Includes patients who died in-hospital*

Table 5.9.3 Overall outcomes for patients with STEMI by CABG at admission, NCVD-ACS Registry, 2006-2010

	+Outcome	In-hospital				30-day*			
		Yes		No		Yes		No	
		No.	%	No.	%	No.	%	No.	%
2006 - 2008	Alive	25	89	4140	90	24	86	3922	85
	Died	3	11	479	10	4	14	697	15
2009	Alive	4	100	1522	91	4	100	1471	88
	Died	0	0	155	9	0	0	206	12
2010	Alive	6	100	1643	91	6	100	1584	88
	Died	0	0	153	9	0	0	212	12
2006 - 2010	Alive	35	92	7305	90	34	89	6977	86
	Died	3	8	787	10	4	11	1115	14

+ The outcome data is derived based on data matching with the National Death Register
**Includes patients who died in-hospital*

Table 5.9.4 Overall outcomes for patients with STEMI by pre-admission aspirin use, NCVD-ACS Registry, 2006-2010

	+Outcome	In-hospital						30-day*					
		Yes		No		Not known		Yes		No		Unknown	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
2006 - 2008	Alive	760	86	2996	91	409	88	711	81	2840	86	395	85
	Died	120	14	307	9	55	12	169	19	463	14	69	15
2009	Alive	342	89	1114	91	70	88	323	84	1086	89	66	83
	Died	41	11	104	9	10	13	60	16	132	11	14	18
2010	Alive	332	91	1238	92	79	89	323	89	1194	88	73	82
	Died	31	9	112	8	10	11	40	11	156	12	16	18
2006 - 2010	Alive	1434	88	5348	91	558	88	1357	83	5120	87	534	84
	Died	192	12	523	9	75	12	269	17	751	13	99	16

+ The outcome data is derived based on data matching with the National Death Register
**Includes patients who died in-hospital*

Table 5.10.1 Overall outcomes for patients with NSTEMI/UA by Percutaneous Coronary Intervention at admission, NCVD-ACS Registry, 2006-2010

	+Outcome	In-hospital				30-day*			
		Yes		No		Yes		No	
		No.	%	No.	%	No.	%	No.	%
2006 - 2008	Alive	553	95	4337	93	524	90	3851	83
	Died	29	5	305	7	58	10	791	17
2009	Alive	171	96	1631	94	167	94	1511	87
	Died	7	4	104	6	11	6	224	13
2010	Alive	118	96	1381	94	112	91	1253	85
	Died	5	4	95	6	11	9	223	15
2006 - 2010	Alive	842	95	7349	94	803	91	6615	84
	Died	41	5	504	6	80	9	1238	16

+ The outcome data is derived based on data matching with the National Death Register
**Includes patients who died in-hospital*

Table 5.10.2 Overall outcomes for patients with NSTEMI/UA by CABG at admission, NCVD-ACS Registry, 2006-2010

	+Outcome	In-hospital				30-day*			
		Yes		No		Yes		No	
		No.	%	No.	%	No.	%	No.	%
2006 - 2008	Alive	98	88	4792	94	94	84	4281	84
	Died	14	13	320	6	18	16	831	16
2009	Alive	26	93	1776	94	25	89	1653	88
	Died	2	7	109	6	3	11	232	12
2010	Alive	12	100	1487	94	11	92	1354	85
	Died	0	0	100	6	1	8	233	15
2006 - 2010	Alive	136	89	8055	94	130	86	7288	85
	Died	16	11	529	6	22	14	1296	15

+ The outcome data is derived based on data matching with the National Death Register
**Includes patients who died in-hospital*

Table 5.10.3 Overall outcomes for patients with NSTEMI/UA by pre-admission aspirin use, NCVD-ACS Registry, 2006-2010

	+Outcome	In-hospital						30-day*					
		Yes		No		Not known		Yes		No		Unknown	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
2006 - 2008	Alive	2240	94	1965	94	685	94	1960	82	1781	85	634	87
	Died	153	6	135	6	46	6	433	18	319	15	97	13
2009	Alive	940	94	825	94	37	93	867	87	775	88	36	90
	Died	56	6	52	6	3	8	129	13	102	12	4	10
2010	Alive	699	93	719	94	81	98	628	84	662	87	75	90
	Died	52	7	46	6	2	2	123	16	103	13	8	10
2006 - 2010	Alive	3879	94	3509	94	803	94	3455	83	3218	86	745	87
	Died	261	6	233	6	51	6	685	17	524	14	109	13

+ The outcome data is derived based on data matching with the National Death Register
**Includes patients who died in-hospital*

Table 5.11.1 Prognostic factors for death in hospital among STEMI patients, NCVD-ACS Registry, 2006-2010

Factors	N	Odds Ratio	95% CI		P-value
Age group, years					
20 - <40 (ref)	635	1.00			
40 - <60	4470	1.23	(0.76,	1.99)	0.398
≥60	3025	1.96	(1.21,	3.19)	0.006
Gender					
Male (ref)	6941	1.00			
Female	1189	1.09	(0.86,	1.39)	0.468
Ethnic group*					
Malay (ref)	4466	1.00			
Chinese	1614	0.90	(0.72,	1.11)	0.322
Indian	1502	0.80	(0.63,	1.02)	0.072
Others	548	0.72	(0.50,	1.04)	0.078
Killip classification					
I (ref)	4420	1.00			
II	1553	1.32	(1.03,	1.68)	0.028
III	297	2.82	(2.00,	3.97)	0.000
IV	493	7.07	(5.38,	9.30)	0.000
Not stated/inadequately described/missing	1367	1.64	(1.28,	2.11)	0.000
Percutaneous Coronary Intervention					
Yes	1472	0.89	(0.61,	1.30)	0.558
No (ref)	6658	1.00			
Cardiac catheterisation					
Yes	1744	1.04	(0.73,	1.48)	0.835
No (ref)	6386	1.00			
TIMI risk score					
0-2 (ref)	2750	1.00			
3-4	2523	1.61	(1.17,	2.21)	0.003
5-7	2269	3.30	(2.42,	4.49)	0.000
>7	588	7.31	(5.05,	10.57)	0.000
Fibrinolytic therapy					
Given	5982	0.60	(0.50,	0.72)	0.000
Not given (ref)	2148	1.00			

Factors	N	Odds Ratio	95% CI		P-value
Smoking					
Never (ref)	2393	1.00			
Former (quit >30 days)	1522	2.57	(1.86,	3.56)	0.000
Current (any tobacco use within last 30 days)	3845	2.00	(1.46,	2.74)	0.000
Unknown	370	0.97	(0.66,	1.42)	0.860
Family history of premature cardiovascular disease					
Yes	938	1.81	(1.24,	2.65)	0.002
No (ref)	4804	1.00			
Unknown	2388	0.99	(0.79,	1.25)	0.960
Dyslipidaemia					
Yes	2006	1.92	(1.40,	2.62)	0.000
No (ref)	3084	1.00			
Unknown	3040	1.28	(1.02,	1.61)	0.036
Hypertension					
Yes	3982	3.41	(2.50,	4.64)	0.000
No (ref)	2769	1.00			
Unknown	1379	1.06	(0.73,	1.55)	0.756
Diabetes					
Yes	2969	2.89	(2.17,	3.86)	0.000
No (ref)	3574	1.00			
Unknown	1587	0.90	(0.64,	1.29)	0.576
Heart failure					
Yes	267	1.53	(1.07,	2.19)	0.020
No (ref)	6376	1.00			
Unknown	1487	1.36	(0.98,	1.88)	0.064
Coronary artery disease**					
Yes	4877	0.96	(0.77,	1.19)	0.694
No (ref)	1777	1.00			
Unknown	1476	0.84	(0.58,	1.20)	0.338

**'Others' includes Orang asli, Kadazan, Melanau, Murut, Bajau, Bidayuh, Iban, other Malaysian and foreigner*
***Coronary artery disease is defined as 'Yes' to 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)*

Table 5.11.2 Prognostic factors for death in hospital among NSTEMI/UA patients, NCVD-ACS Registry, 2006-2010

Factors	N	Odds ratio	95% CI		P-value
Age group, years					
20 - <40 (ref)	296	1.00			
40 - < 60	3719	2.72	(0.97,	7.68)	0.058
≥60	4721	6.30	(2.25,	17.65)	0.000
Gender					
Male (ref)	5882	1.00			
Female	2854	0.80	(0.64,	1.00)	0.053
Ethnic group*					
Malay (ref)	3852	1.00			
Chinese	2142	0.89	(0.72,	1.12)	0.323
Indian	2385	0.72	(0.57,	0.93)	0.010
Others	357	0.76	(0.47,	1.23)	0.270
Killip classification code					
I (ref)	4273	1.00			
II	1313	2.02	(1.54,	2.64)	0.000
III	331	4.71	(3.35,	6.62)	0.000
IV	151	16.94	(11.46,	25.03)	0.000
Not stated/ inadequately described	2668	1.64	(1.29,	2.09)	0.000
Percutaneous Coronary Intervention					
Yes	883	0.67	(0.44,	1.03)	0.066
No (ref)	7853	1.00			
Cardiac catheterisation					
Yes	1474	1.55	(1.12,	2.13)	0.007
No (ref)	7262	1.00			
TIMI risk score					
0-2 (ref)	4794	1.00			
3-4	3276	0.97	(0.78,	1.20)	0.774
5-7	666	1.56	(1.10,	2.21)	0.012
Smoking					
Never (ref)	4127	1.00			
Former (quit >30 days)	2261	1.71	(1.23,	2.37)	0.001
Current (any tobacco use within last 30 days)	1760	1.79	(1.25,	2.56)	0.001
Unknown	588	1.10	(0.77,	1.57)	0.602

Factors	N	Odds ratio	95% CI		P-value
Family history of premature cardiovascular disease					
Yes	964	0.87	(0.55,	1.40)	0.571
No (ref)	4907	1.00			
Unknown	2865	0.93	(0.74,	1.17)	0.542
Dyslipidaemia					
Yes	3611	1.54	(1.12,	2.12)	0.008
No (ref)	3009	1.00			
Unknown	2116	0.76	(0.56,	1.02)	0.064
Hypertension					
Yes	6334	1.89	(1.33,	2.70)	0.000
No (ref)	1626	1.00			
Unknown	776	1.14	(0.69,	1.87)	0.605
Diabetes					
Yes	4276	2.52	(1.84,	3.46)	0.000
No (ref)	3376	1.00			
Unknown	1084	1.29	(0.84,	1.99)	0.250
Heart failure					
Yes	965	1.98	(1.54,	2.53)	0.000
No (ref)	6505	1.00			
Unknown	1266	1.31	(0.91,	1.88)	0.142
Coronary artery disease**					
Yes	6773	0.69	(0.52,	0.91)	0.008
No (ref)	1032	1.00			
Unknown	931	0.81	(0.52,	1.25)	0.347

**'Others' includes Orang asli, Kadazan, Melanau, Murut, Bajau, Bidayuh, Iban, other Malaysian and foreigner **Coronary artery disease is defined as 'Yes' to 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)*

Table 5.11.3 Prognostic factors for death within 30 days among STEMI patients, NCVD-ACS Registry, 2006-2010

Factors	N	Odds Ratio	95% CI		P-value
Age group, years					
20 - <40 (ref)	635	1.00			
40 - <60	4470	1.21	(0.82,	1.78)	0.348
≥60	3025	2.21	(1.48,	3.28)	0.000
Gender					
Male (ref)	6941	1.00			
Female	1189	1.22	(1.00,	1.50)	0.054
Ethnic group*					
Malay (ref)	4466	1.00			
Chinese	1614	0.91	(0.75,	1.09)	0.292
Indian	1502	0.85	(0.69,	1.04)	0.109
Others	548	0.60	(0.43,	0.83)	0.002
Killip classification code					
I (ref)	4420	1.00			
II	1553	1.30	(1.07,	1.59)	0.009
III	297	2.81	(2.08,	3.79)	0.000
IV	493	5.04	(3.93,	6.48)	0.000
Not stated/inadequately described/missing	1367	1.14	(0.92,	1.42)	0.227
Percutaneous Coronary Intervention					
Yes	1472	0.67	(0.49,	0.92)	0.014
No (ref)	6658	1.00			
Cardiac catheterisation					
Yes	1744	1.36	(1.02,	1.82)	0.037
No (ref)	6386	1.00			
TIMI risk score					
0-2 (ref)	2750	1.00			
3-4	2523	1.48	(1.16,	1.89)	0.001
5-7	2269	2.72	(2.13,	3.48)	0.000
>7	588	5.79	(4.25,	7.89)	0.000
Fibrinolytic therapy					
Given	5982	0.60	(0.52,	0.71)	0.000
Not given (ref)	2148	1.00			

Factors	N	Odds Ratio	95% CI		P-value
Smoking					
Never (ref)	2393	1.00			
Former (quit >30 days)	1522	1.93	(1.47,	2.53)	0.000
Current (any tobacco use within last 30 days)	3845	1.59	(1.22,	2.05)	0.000
Unknown	370	0.98	(0.70,	1.36)	0.892
Family history of premature cardiovascular disease					
Yes	938	1.65	(1.22,	2.24)	0.001
No (ref)	4804	1.00			
Unknown	2388	1.08	(0.88,	1.31)	0.472
Dyslipidaemia					
Yes	2006	1.64	(1.27,	2.12)	0.000
No (ref)	3084	1.00			
Unknown	3040	1.34	(1.10,	1.63)	0.003
Hypertension					
Yes	3982	2.35	(1.83,	3.02)	0.000
No (ref)	2769	1.00			
Unknown	1379	0.96	(0.69,	1.33)	0.790
Diabetes					
Yes	2969	2.42	(1.91,	3.07)	0.000
No (ref)	3574	1.00			
Unknown	1587	0.91	(0.67,	1.24)	0.543
Heart failure					
Yes	267	1.54	(1.12,	2.13)	0.008
No (ref)	6376	1.00			
Unknown	1487	1.18	(0.89,	1.57)	0.245
Coronary artery disease**					
Yes	4877	0.90	(0.74,	1.08)	0.262
No (ref)	1777	1.00			
Unknown	1476	0.93	(0.68,	1.27)	0.644

**'Others' includes Orang asli, Kadazan, Melanau, Murut, Bajau, Bidayuh, Iban, other Malaysian and foreigner **Coronary artery disease is defined as 'Yes' to 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)*

Table 5.14.4 Prognostic factors for death within 30 days among NSTEMI/UA patients, NCVD-ACS Registry, 2006-2010

Factors	N	Odds ratio	95% CI		P-value
Age group, years					
20 - <40 (ref)	296	1.00			
40 - < 60	3719	1.88	(1.05	3.37)	0.034
≥60	4721	4.11	(2.30	7.33)	0.000
Gender					
Male (ref)	5882	1.00			
Female	2854	0.91	(0.78	1.06)	0.214
Ethnic group*					
Malay (ref)	3852	1.00			
Chinese	2142	0.92	(0.79	1.07)	0.274
Indian	2385	0.83	(0.71	0.97)	0.022
Others	357	0.61	(0.43	0.88)	0.008
Killip classification code					
I (ref)	4273	1.00			
II	1313	1.96	(1.66	2.33)	0.000
III	331	3.05	(2.35	3.96)	0.000
IV	151	7.12	(5.00	10.19)	0.000
Not stated/ inadequately described	2668	1.06	(0.91	1.25)	0.439
Percutaneous Coronary Intervention					
Yes	883	0.58	(0.43	0.79)	0.001
No (ref)	7853	1.00			
Cardiac catheterisation					
Yes	1474	1.06	(0.84	1.32)	0.633
No (ref)	7262	1.00			
TIMI risk score					
0-2 (ref)	4794	1.00			
3-4	3276	1.18	(1.02	1.36)	0.024
5-7	666	1.48	(1.17	1.88)	0.001
Smoking					
Never (ref)	4127	1.00			
Former (quit >30 days)	2261	1.67	(1.37	2.10)	0.000
Current (any tobacco use within last 30 days)	1760	1.51	(1.19	1.92)	0.001
Unknown	588	1.15	(0.89	1.49)	0.271

Factors	N	Odds Ratio	95% CI		P-value
Family history of premature cardiovascular disease					
Yes	964	0.94	(0.71	1.25)	0.688
No (ref)	4907	1.00			
Unknown	2865	1.07	(0.91	1.25)	0.405
Dyslipidaemia					
Yes	3611	1.59	(1.29	1.95)	0.000
No (ref)	3009	1.00			
Unknown	2116	0.94	(0.77	1.15)	0.559
Hypertension					
Yes	6334	1.93	(1.52	2.45)	0.000
No (ref)	1626	1.00			
Unknown	776	1.46	(1.02	2.08)	0.037
Diabetes					
Yes	4276	2.08	(1.70	2.55)	0.000
No (ref)	3376	1.00			
Unknown	1084	0.83	(0.61	1.12)	0.222
Heart failure					
Yes	965	1.80	(1.52	2.15)	0.000
No (ref)	6505	1.00			
Unknown	1266	0.94	(0.73	1.21)	0.646
Coronary artery disease**					
Yes	6773	0.75	(0.62	0.91)	0.004
No (ref)	1032	1.00			
Unknown	931	0.89	(0.65	1.21)	0.460

**'Others' includes Orang asli, Kadazan, Melanau, Murut, Bajau, Bidayuh, Iban, other Malaysian and foreigner*
***Coronary artery disease is defined as 'Yes' to 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)*

APPENDIX

APPENDIX A: DATA MANAGEMENT

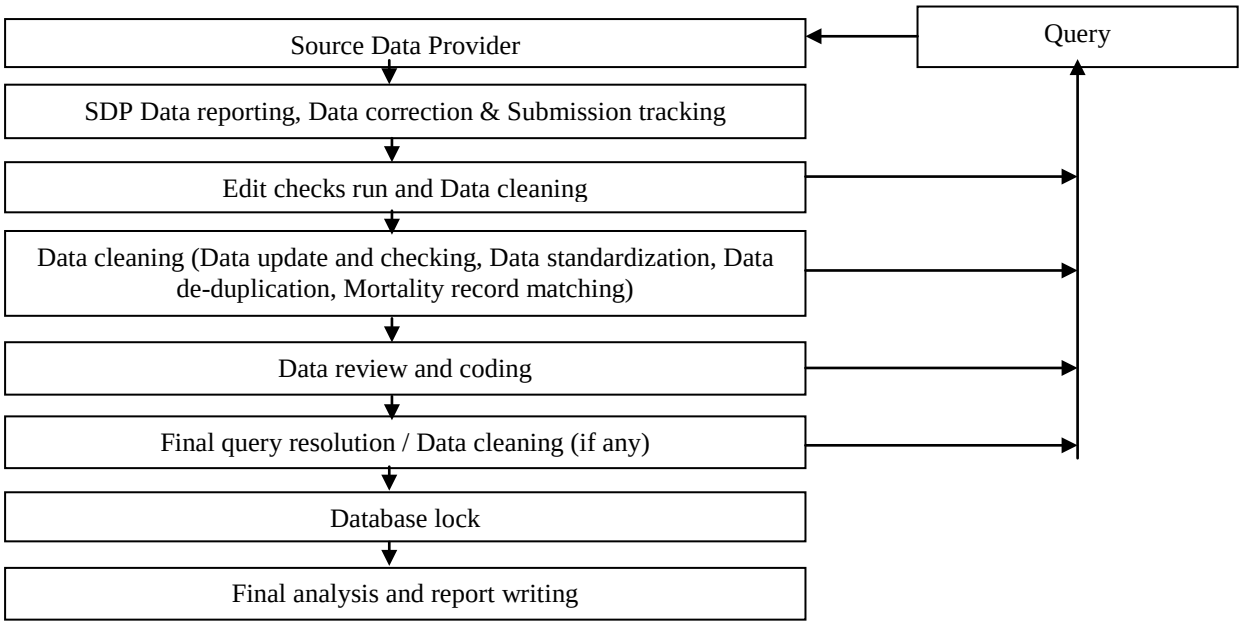
The National Cardiovascular Disease Database (NCVD) Registry maintains two different databases for cardiovascular diseases, i.e. for Acute Coronary Syndrome and Percutaneous Coronary Intervention. Data is stored in SQL Server due to the high volume of data accumulated throughout the years.

Data sources

Source Data Providers (SDPs) of NCVD-ACS registry comprise of all major hospitals who have participated in the registry, throughout Malaysia.

Data Flow Process

This section describes the data management flow process of the National Cardiovascular Disease Database Registry.



SDP Data reporting, Data Correction and Submission tracking

Data reporting by SDP is done via Web Applications e-Case Report Forms.

There are a number of data security features that are designed into the NCVD web application (eCRF) such as web owner authentication, 2-level user authentication (user name and password authentication and a Short Messaging System (SMS) of authorisation code of mobile phone authentication), access control, data encryption, session management to automatically log off the application, audit trail and data backup and disaster recovery plan.

For ACS, SDP submits NCVD-ACS Notification form on an ad-hoc basis whenever a patient was admitted for an ACS event. SDP also submits follow-up data at 30 days and 12 months post notification date intervals. An alert page containing all the overdue submissions for follow-up at 30-days and 12-months post notification date is available to users for ease of submissions tracking.

Prior to registering a patient record, a verification process is done by using the search functionality to search if the patient already exists in the registry. The application will still detect a duplicate record if the same MyKad number is keyed in, should the step of searching patient not done. This step is done to avoid duplicate records. For patients whose records already exist in the database, the SDP need only add a new ACS notification as the basic patient particulars are pre-filled, based on existing patient information in the database. The ACS and PCI registries share the same patient list.

There are a few in-built functionalities at the data entry page that serve to improve data quality. One such function is auto calculation function to reduce human error, in calculations. There is also an inconsistency check functionality that disables certain fields and prompts the user, if the value entered is out of range.

A real time data query page is also available via the web application to enable users to check which non-compulsory data is missing, out of range or inconsistent. A link is provided on the data query page for user to click on to resolve the query for the particular patient.

Real time reports are also provided in the web application. The aggregated data reports are presented in the form of tables and graphs. The aggregated data reports are typically presented in two forms, one as centre's own aggregated data report and another as the registry's overall aggregated data report. In this way, the centre can be compared with the overall registry's average.

Data download function is also available in the web application to allow users to download their own centre's data from all the forms entered, for their own further analyses. The data are downloadable as Text - tab delimited (.txt) format, Microsoft excel workbook (.xls) and as Comma separated value (.csv) format.

Edit checks run and Data cleaning
Edit checks is performed periodically by the registry manager to identify missing compulsory data, out of range values, inconsistency of data, invalid values and errors with de-duplication. Data cleaning is then performed based on the results of edit checks. Data update and data checking of the dataset is performed when there is a query of certain fields as and when necessary. It could be due to request by user, correction of data based on checking via data query in eCRF or after receiving results for preliminary data analysis. During data standardisation, missing data are handled based on derivation from existing data. Data de-duplication is also performed to identify duplicate records in the database that might have been missed out by SDPs. Finally record matching against the National Death Register *(Jabatan Pendaftaran Negara)* is performed to verify the mortality status of the patient.

Final query resolution / data cleaning / database lock
A final edit check run is performed to ensure that the data is clean. All queries will be resolved before the database is locked, to ensure data quality and integrity. The final dataset is subsequently locked and exported to the statistician for analysis.

Data analysis
Please refer to Statistical Analysis Method section for further details.

Data release policy
One of the primary objectives of the Registry is to make data available to the cardiovascular healthcare providers, policy makers and researchers. The Registry would appreciate if users acknowledge the Registry for the use of the data. Any request for data that requires a computer run must be made in writing (by e-mail, fax, or registered mail) accompanied with a Data Release Application Form and signed Data Release Agreement Form. These requests need prior approval by the Advisory Board before data can be released.

Registry ICT Infrastructure and Data centre
The operation of the NCVD is supported by an extensive ICT infrastructure to ensure operational efficiency and effectiveness.

The NCVD subscribes to co-location service with a high availability and highly secured Internet Data Centre at Cyberjaya in order to provide NCVD with quality assured Internet Hosting services and state-of-the-art physical and logical security features without having to invest in costly data centre setup internally. Physical security features implemented includes state-of-the-art security features such as anti-static raised flooring, fire protection with smoke and heat alarm warning system, biometric security access, video camera surveillance system, uninterrupted power supply, environmental control, etc.

Other managed security services include patch management of the servers, antivirus signature monitoring and update, firewall traffic monitoring and intrusion detection, security incidence response, data backup service done on a daily, weekly and monthly basis, data recovery simulation to verify that the backup works, which is done at least once yearly, network security scan and penetration test done on a half-yearly basis, security policy maintenance, maintenance and monitoring of audit trail of user access, etc. Managed system services such as usage and performance report, operating system maintenance and monitoring, bandwidth monitoring and systems health monitoring are also provided.

APPENDIX B: STATISTICAL METHODS

The statistical methods described were used to summarise the data collected from National Cardiovascular Database NCVD-ACS.

The data without missing on initial diagnosis, final diagnosis was neither stable angina nor non-cardiac, aged at 20 years old that were admitted from 1st January 2006 till 31st Dec 2010 were analysed. The data was stratified to reflect differences in

- Demography: race, gender , age
- Medical factors: pre-morbid or past medical history
- Initial diagnoses: ACS stratums
- Therapy: fibrinolytic given, aspirin use

Methods for handling missing data and outliers

Missing age was imputed using the hotdeck method. The variables were set to missing value if it lay outside the acceptable range as seen in table below.

Fields	Acceptable range
Number of distinct episodes of angina	≤ 20
Heart Rate	20 - 200 beats/min (should not be 0)
Systolic BP	60 - 230 mmHg (should not be 0)
Diastolic BP	10 -120 mmHg (should not be 0)
Height	130 cm - 210 cm (should not be 0)
Weight	30 kg - 200 kg (should not be 0)
Waist circumference	≥ 36 cm
Hip circumference	60 - 200 cm (should not be 0)
Peak CK-MB	< 1000 Unit/L (should not be 0)
Peak CK-MB	< 10 000 Unit/L (should not be 0)
Peak Troponin - TnT	No range
Peak Troponin - TnI	No range
Total Cholesterol, TC	3 -20 mmol/L
LDL	1 -15 mmol/L
HDL-C	0.5 -5 mmol/L
Triglycerides, Tg	1 - 15 mmol/L
Fasting Blood Glucose	3 - 30 mmol/L
Left Venrticular Ejection Fraction, LVEF	5% - 80%
Onset to Door	(should not be 0)
Door to needle time (mins)	1 min - 24 hours (or equivalent minutes) (should not be 0)
Door to balloon time (mins)	1 min - 24 hours (or equivalent minutes) Apply only for patients with STEMI and planned for primary angioplasty (should not be 0)

Patient Characteristics

The information on patient characteristics was summarized by number of admissions in chapter 2 of the report. These tables included patients' age, gender, ethnic group, coronary risk factors, anthropometric measurements, co-morbidity, and also the distribution of patients by source data providers (SDP). Continuous variables were summarised using summary statistics, such as mean, standard deviation, median, minimum and maximum were reported. On the other hand, both the frequency count and percentage were reported for categorical data.

Invariably, there were situations where there was missing data. For the purpose of analysis, subjects with missing age had their values imputed by using a hotdeck imputation method. For discrete data, analysis was confined to available data and no imputation was done.

Cardiac Presentation

Chapter 3 of the report basically was to summarize the patient characteristics, vital sign measurements, and laboratory parameters by ACS stratum such as STEMI, NSTEMI and UA, age groups namely young, middle-age and elderly, gender as well as the pre-morbid conditions such as diabetes, hypertension, and dyslipidaemia by number of admissions. Continuous variables were summarised using summary statistics, such as mean, standard deviation, median, minimum and maximum were reported. On the other hand, frequency count and percentage were reported for categorical data.

Treatment

The treatments that were provided to the patients were mainly summarized in chapter 4 of the report by number of admissions. This information was cross tabulated by ACS stratum, age group, gender as well as the main ethnic group in Malaysia. No imputation was done for this chapter.

Clinical Outcomes

Chapter 5 of the report summarized the overall in-hospital as well as 30-day outcomes for patients with ACS by number of admissions. Cross tabulations of outcomes by gender, pre-morbid conditions such as diabetes, hypertension, dyslipidaemia, and ACS stratum were included in this chapter. Tabulation of outcomes by fibrinolytic therapy was only presented for STEMI patients. Other tabulations such as outcomes by percutaneous coronary intervention at admission, CABG at admission, and also the pre-admission aspirin use were presented separately for patients with STEMI and NSTEMI/UA. Prognostic factors for in-hospital death as well as death in 30 days were summarized separately for STEMI and NSTEMI/UA patients. No imputation was done for this chapter.

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APPENDIX E: GLOSSARY

Acute Coronary Syndrome (ACS)	Indicates if the patient is suffering from an ACS event. ACS encompasses clinical features comprising chest pain or overwhelming shortness of breath, defined by accompanying clinical, ECG and biochemical features. ACS comprises the following: - Unstable Angina Pectoris (UAP) - NSTEMI - STEMI
Bleeding	The person's episode of bleeding as described by the thrombolysis in myocardial infarction (TIMI) criteria. Indicate if bleeding occurred during or after the cath. lab visit until discharge. The bleeding should require a transfusion and/or prolong the hospital stay and/or cause a drop in haemoglobin > 3.0 gm/dl.
Body Mass Index (BMI)	A measurement of the relative percentages of fat and muscle mass in the human body, in which weight in kilograms is divided by height in meters and the result used as an index of obesity (kgm-2). This will be autocalculated by the system.
Canadian Cardiovascular Score (CCS)	Indicates the Canadian Cardiovascular Angina Classification Score (CCS) of a patient which is categorised as: Class 0; Asymptomatic Class 1; Ordinary physical activity, such as walking or climbing the stairs does not cause angina. Angina may occur with strenuous, rapid or prolonged exertion at work or recreation. Class 2; There is slight limitation of ordinary activity. Angina may occur with moderate activity such as walking or climbing stairs rapidly, walking uphill, walking or climbing stairs after meals, in the cold, in the wind, or under emotional stress, or walking more than two blocks on the level, and climbing more than one flight of stairs at normal pace under normal conditions. Class 3; There is marked limitation of ordinary physical activity. Angina may occur after walking one or two blocks on the level or climbing one flight of stairs under normal conditions at a normal pace. Class 4; There is inability to carry on any physical activity without discomfort; angina may be present at rest.
Chronic renal failure	Indicates if the patient has a history and/or documented evidence and/or have undergone treatment for chronic renal failure. Includes all patients with creatinine 200 micromol/L.
Diabetes	Indicate if the patient has diabetes as documented by following: 1. A history of diabetes, regardless of duration of disease, or need for antidiabetic agents, or 2. Fasting blood glucose > 7.0mmol/L, or 3. HbA1c > 6.5mmol/L
Documented CAD	Indicates if the patient has angiographically-proven coronary disease (stenosis > 50%) or has undergone percutaenous angioplasty (PCI) or coronary artery bypass graft (CABG) prior to this admission to the hospital.
Door to balloon time	The duration between time patient presented to the reporting centre to time of first intracoronary device used performed by the same centre. Applicable only to patients with STEMI undergoing urgent PCI.

Door to needle time	The duration between time patients presented to the reporting centre to time intravenous fibrinolytic therapy was administered or initiated by that same centre. Applicable only to STEMI patients receiving thrombolysis at the reporting centre.
Elective PCI	PCI performed for patients with stable CAD.
Fibrinolytic therapy status	Identifies the person's fibrinolytic therapy status. Applicable only to patients presenting with STEMI. This data may be entered by the reporting centre for patients who received thrombolysis prior to transfer. Also indicates whether and where thrombolysis were given . Only thrombolysis instituted by the participating centre will be calculated for 'Door-to-Needle' time.
Killip classification	Identifies the Killip class, as a measure of haemodynamics compromise, of the person at the time of presentation **Class I** includes individuals with no clinical signs of heart failure **Class II** includes individuals with rales in the lungs, an S3 gallop, and elevated jugular venous pressure **Class III** describes individuals with frank pulmonary oedema **Class IV** describes individuals in cardiogenic shock
Left Ventricular Ejection Fraction (LVEF)	The left ventricular ejection fraction as measured by the percentage of the blood emptied from the left ventricle at the end of the contraction. Indicate the EF status at time of PCI procedure. The most recent test within the last 6 months, including the current procedure and up to discharge following the procedure.
New York Heart Association	Indicates the patient's NYHA classification as follows: I. Patient has cardiac disease but without resulting limitations of ordinary physical activity; Ordinary physical activity (e.g. walking several blocks or climbing stairs) does not cause undue fatigue or dyspnoea. Limiting symptoms may occur with marked exertion II. Patient has cardiac disease resulting in slight limitation of ordinary physical activity. Patient is comfortable at rest. Ordinary physical activity such as walking more than 2 blocks or climbing more than one flight of stairs results in limiting symptoms (e.g., fatigue or dyspnoea) III. Patient has cardiac disease resulting in marked limitation of physical activity. Patient is comfortable at rest. Less than ordinary physical activity (e.g., walking one to two level blocks or climbing one flight of stairs) causes fatigue or dyspnoea IV. Patient has dyspnoea at rest that increases with any physical activity. Patient has cardiac disease resulting in inability to perform any physical activity without discomfort. Symptoms may be present even at rest. If any physical activity is undertaken, discomfort is increased
Smoking status	Indicate if the patient has a history confirming any form of tobacco use in the past. This includes use of cigarettes / cigars / pipes/ tobacco chewing.
Time of STEMI onset	Indicate time of STEMI onset. Please give exact time of onset of pain (or nearest half hour).
Time patient presented	Defines the time that patient presented to the reporting centre (or nearest half hour).

TIMI Risk score for STEMI	Thrombolysis in myocardial infarction (TIMI) risk score for STEMI is based on following criteria: (Max 14 points) a) S1(5b) Age ≥ 75 - 3 point, Age 65 to 74 - 2 points b) S2(2) (c)Diabetes OR (b)Hypertension OR (g)Chronic angina (onset more than 2 weeks ago) OR (h)New onset angina (Less than 2 weeks) - 1 point c) S4(3a)Systolic BP <100 mmHg - 3 points d) S4(2) Heart Rate > 100 beat per minute - 2 points e) Killip II-IV - 2 points f) S4(4b) Weight < 67 kg - 1 point g) S5(2) Anterior Leads: V1 to V4, S5(1) Bundle Branch block (BBB) - 1 point h) Time to Treatment>4 - 1 point
TIMI Risk score for NSTEMI/UA	Thrombolysis in myocardial infarction (TIMI) risk score for UA/NSTEMI is based on following criteria: 1 point for each criteria below a) Age ≥ 65 b) At least 3 risk factors (Past medical history: dyslipidaemia, HPT, diabetes, premature cardiovascular disease family history status) c) Known CAD (stenosis ≥ 50%) (Past medical history: Myocardial infarction history, Documented CAD >50% stenosis) d) ST (ECG) deviation ≥ 0.5mm (ECG Abnormalities Type: ST-segment elevation ≥ 1mm (0.1 mV) in ≥ 2 contiguous leads, ST-segment elevation ≥ 2mm (0.2 mV) in ≥ 2 contiguous leads, · ST-segment depression ≥ 0.5mm (0.05 mV) in ≥ 2 contiguous leads (includes reciprocal changes)) e) Recent (≤ 24 hrs) Severe angina (≥ 2 angina in last 24 hrs) f) Use of anti-platelet agent (ASA) in last 7 days (Used at least one of ASA, ADP Antagonist) g) Elevated cardiac enzymes/markers: CK-MB (Peak CKMB value > CKMB Reference Upper limit) and Troponin (Peak Troponin value > Troponin Reference Upper limit)
Total number of overnight stays	Total number of days spent in at the reporting centre, either consecutively or intermittently.

APPENDIX F: CASE REPORT FORM

NATIONAL CARDIOVASCULAR DISEASE DATABASE (NCVD) NOTIFICATION FORM

For NCVD Use only:

ID: /
Centre:

Instruction: Complete this form to notify all ACS admissions at your centre to National Cardiovascular Disease Registry. Where check boxes ☐ are provided, check (√) one or more boxes. Where radio buttons ◉ are provided, check (√) one box only.

A. Reporting centre: _____ **B. Date of Admission (dd/mm/yy):** | | | | | | |

SECTION 1 : DEMOGRAPHICS

1. Patient Name :		**2. Local RN No (if applicable):**	
3. Identification Card Number :	*MyKad / MyKid:*	- -	*Old IC:*
	Other ID document No:	→	*Specify type (eg.passport, armed force ID):*
4. Gender:	◉ Male ◉ Female		
5a. Date of Birth:	d d m m y y	**5b. Age on admission:**	Auto Calculated
6. Ethnic Group:	◉ Malay ◉ Orang Asli ◉ Murut ◉ Iban ◉ Chinese ◉ Kadazan ◉ Bajau ◉ Other M'sian, specify : ..... ◉ Indian ◉ Melanau ◉ Bidayuh ◉ Foreigner, specify country of origin:		
7. Contact Number	*(1):*	*(2):*	

SECTION 2 : STATUS BEFORE EVENT

1. Smoking Status:	◉ Never	◉ Former (quit >30 days)	◉ Current (any tobacco use within last 30 days)
2. Status of Aspirin Use:	◉ None	◉ Used less than 7 days previously	◉ Used more than or equal to 7 days previously

3. Premorbid or past medical history :

a) Dyslipidaemia	◉ Yes	◉ No	◉ Not known	h) New onset angina (Less than 2 weeks)	◉ Yes	◉ No	◉ Not known
b) Hypertension	◉ Yes	◉ No	◉ Not known				
c) Diabetes	◉ Yes	◉ No	◉ Not known	i) Heart failure	◉ Yes	◉ No	◉ Not known
d) Family history of premature cardiovascular disease	◉ Yes	◉ No	◉ Not known	j) Chronic lung disease	◉ Yes	◉ No	◉ Not known
				k) Renal disease	◉ Yes	◉ No	◉ Not known
e) Myocardial infarction history	◉ Yes	◉ No	◉ Not known	l) Cerebrovascular disease	◉ Yes	◉ No	◉ Not known
f) Documented CAD > 50% stenosis	◉ Yes	◉ No	◉ Not known	m) Peripheral vascular disease	◉ Yes	◉ No	◉ Not known
g) Chronic Angina (onset more than 2 weeks ago)	◉ Yes	◉ No	◉ Not known	n) None of the above	☐		

SECTION 3 : ONSET

1a. Date of onset of ACS symptoms:	d d m m y y	**1b. Time of onset of ACS symptoms:**	h h m m (24hr) ☐ Not available
2a. Date Patient presented :	d d m m y y	**2b. Time Patient presented :**	h h m m (24hr) ☐ Not available
3. Was patient transferred from another centre?	◉ Yes ◉ No		

SECTION 4 : CLINICAL PRESENTATION & EXAMINATION

1. Number of distinct episodes of angina in past 24 hours:		☐ Not available			
2. Heart rate at presentation:		(beats / min)			
3. Blood pressure at presentation:	**a. Systolic:**	(mmHg)	**b. Diastolic:**	(mmHg)	
4. Anthropometric :	**a. Height:**	(cm) ☐ Not available	**BMI:**		Auto Calculated
	b. Weight:	(kg) ☐ Not available			
	c. Waist Circumference:	(cm) ☐ Not available	**WHR:**		Auto Calculated
	d. Hip Circumference:	(cm) ☐ Not available			
5. Kilip classification code :	◉ I ◉ II ◉ III ◉ IV ◉ Not stated / inadequately described				

SECTION 5 : ELECTROCARDIOGRAPHY (ECG)

1. ECG abnormalities type *(Check one or more boxes)*	☐ ST-segment elevation ≥ 1mm (0.1 mV) in ≥ 2 contiguous limb leads ☐ ST-segment elevation ≥ 2mm (0.2 mV) in ≥ 2 contiguous frontal leads or chest leads ☐ ST-segment depression ≥ 0.5mm (0.05 mV) in ≥ 2 contiguous leads ☐ T-wave inversion ≥ 1mm (0.1 mV) ☐ Bundle branch block (BBB) ☐ Non-specific ☐ None ☐ Not stated / inadequately described
2. ECG abnormalities location : *(Check one or more boxes)*	☐ Inferior leads: II, III, aVF ☐ Anterior leads: V1 to V4 ☐ Lateral leads: I, aVL, V5 to V6 ☐ True posterior: V1 V2 ☐ Right ventricle: ST elevation in lead V4R ☐ None ☐ Not stated / inadequately described

a. Patient Name :		b. Local RN No (if applicable):	
c. Identification Card Number :			

SECTION 6 : BASELINE INVESTIGATIONS (Values obtained within 48 hours from admission)

		Absolute values	Unit	Reference upper limits	Check (√) if not done
1. Peak CK-MB			Unit/L		◉ Not done
2. Peak CK			Unit/L		◉ Not done
3. Peak Troponin:	a. T n T:	◉ +ve ◉ -ve OR	ng/mL or mcg/L		◉ Not done
	b. T n I:	◉ +ve ◉ -ve OR	ng/mL or mcg/L		◉ Not done
4. Lipid profile (Fasting):	a. Total cholesterol:		mmol/L		◉ Not done
	b. HDL-C:		mmol/L		◉ Not done
	c. LDL-C:		mmol/L		◉ Not done
	d. Triglycerides:		mmol/L		◉ Not done
5. Fasting Blood Glucose:			mmol/L		◉ Not done
6. Left Ventricular Ejection Fraction:			%		◉ Not done

SECTION 7 : CLINICAL DIAGNOSIS AT ADMISSION

1. Acute coronary syndrome stratum:	◉ STEMI	◉ NSTEMI	◉ UA
2a. TIMI risk score UAP / NSTEMI:	Auto Calculated	2b. TIMI risk score STEMI:	Auto Calculated

SECTION 8 : FIBRINOLYTIC THERAPY *(Following Section is applicable for STEMI only)*

1. Fibrinolytic therapy status :	◉ Given at this centre → *(Please proceed to 2, 3, 4 below)* ◉ Given at another centre prior to transfer here ◉ Not given-proceeded directly to primary angioplasty ◉ Not given-Missed thrombolysis ◉ Not given-patient refusal ◉ Not given- Contraindicated	
Fill in (2), (3), (4) only if you check 'Given at this centre' in (1) above	2. Fibrinolytic drug used:	◉ Streptokinase ◉ Others (t-PA, r-PA, TNK t-PA)
	3. Intravenous fibrinolytic therapy :	a. Date: d d m m y y — b. Time: h h m m (24hr)
	4. Door to needle time:	*(mins)* Auto Calculated - (time pt presented to time of intravenous fb ty)

SECTION 9 : INVASIVE THERAPEUTIC PROCEDURES

1. Did patient undergo cardiac catheterization on this admission at your centre?	◉ No ◉ No - Transferred to another centre ◉ Yes
2. Did patient undergo percutaneous coronary intervention on this admission? *(If No or Not Applicable, Please skip 5, 6 & 7b below)*	◉ Yes ◉ No ◉ Not applicable ◉ a. For STEMI → ◉ Urgent → ◉ Primary PCI ◉ Rescue PCI ◉ Facilitated PCI ◉ Elective → Routine hospital practice? ◉ Yes ◉ No ◉ b. For NSTEMI / UA → ◉ Urgent ◉ Elective → Routine hospital practice? ◉ Yes ◉ No
3a. Number of diseased vessels:	◉ 0 ◉ 1 ◉ 2 ◉ 3
3b. Left Main Stem involvement:	◉ Yes ◉ No
4. Culprit artery:	◉ LAD ◉ LCx ◉ RCA ◉ LM ◉ Bypass Graft
5. First balloon inflation: (for STEMI - Urgent PCI only)	a. Date: d d m m y y — b. Time: h h m m (24hr)
6. Door to balloon time (mins): (for STEMI - Urgent PCI only)	Auto Calculated - (time pt presented to time of first angio balloon inflation)
7a(i). TIMI flow classification pre-PCI:	◉ 0 ◉ I ◉ II ◉ III
7a(ii). Intra-coronary Thrombus present?	◉ Yes ◉ No
7b. TIMI flow classification post-PCI:	◉ 0 ◉ I ◉ II ◉ III
8. PCI type:	◉ Angioplasty ◉ Stenting → a) ☐ Direct stenting; b) ☐ Pre-dilatation done; c) ☐ Stent type: 'Drug-eluting'; d) ☐ Stent type: 'Bare-metal'
9. Did patient undergo CABG on this admission?	◉ Yes → a. Date of CABG: d d m m y y ◉ No

a. Patient Name :		b. Local RN No (if applicable):	
c. Identification Card Number :			

SECTION 10 : PHARMACOLOGICAL THERAPY *(used / given during admission)*

Group	Given pre admission	Given during admission	Given after discharge
1. ASA	◉ Yes ◉ No	◉ Yes ◉ No	◉ Yes ◉ No
2. ADP antagonist	◉ Yes ◉ No	◉ Yes ◉ No	◉ Yes ◉ No
3. GP receptor inhibitor	◉ Yes ◉ No	◉ Yes ◉ No	
4. Unfrac Heparin	◉ Yes ◉ No	◉ Yes ◉ No	
5. LMWH	◉ Yes ◉ No	◉ Yes ◉ No	
6. Beta blocker	◉ Yes ◉ No	◉ Yes ◉ No	◉ Yes ◉ No
7. ACE Inhibitor	◉ Yes ◉ No	◉ Yes ◉ No	◉ Yes ◉ No
8. Angiotensin II receptor blocker	◉ Yes ◉ No	◉ Yes ◉ No	◉ Yes ◉ No
9. Statin	◉ Yes ◉ No	◉ Yes ◉ No	◉ Yes ◉ No
10. Other lipid lowering agent	◉ Yes ◉ No	◉ Yes ◉ No	◉ Yes ◉ No
11. Diuretics	◉ Yes ◉ No	◉ Yes ◉ No	◉ Yes ◉ No
12. Calcium antagonist	◉ Yes ◉ No	◉ Yes ◉ No	◉ Yes ◉ No
13. Oral Hypoglycaemic agent	◉ Yes ◉ No	◉ Yes ◉ No	◉ Yes ◉ No
14. Insulin	◉ Yes ◉ No	◉ Yes ◉ No	◉ Yes ◉ No
15. Anti-arrhythmic agent	◉ Yes ◉ No	◉ Yes ◉ No	◉ Yes ◉ No

SECTION 11 : IN-HOSPITAL CLINICAL OUTCOMES

1. Number of overnight stays

a. CCU _____ days

b. ICU / CICU: _____ days

2. Outcome:

◉ **Discharged**

a. Date : _____ (dd/mm/yy)

b. Total number of overnight stays: _____ Auto Calculated

◉ **Transferred to another centre**

a. Date : _____ (dd/mm/yy)

b. Name of Centre : _____

◉ **Died**

a. Date : _____ (dd/mm/yy)

b. Cause of Death :
- ◉ Cardiovascular
- ◉ Non Cardiovascular
- ◉ Other,specify : _____

3. Final diagnosis at discharge:
- ◉ Q wave MI
- ◉ non-Q wave MI
- ◉ Unstable angina
- ◉ Stable angina
- ◉ Non-cardiac

4. Bleeding Complication (TIMI Criteria):
- ◉ Major
- ◉ Minor
- ◉ None
- ◉ Not stated / Inadequately described

NATIONAL CARDIOVASCULAR DISEASE DATABASE
FOLLOW UP FORM AT 30 DAYS

For NCVD Use only:
ID: /
Centre:

Instruction: This form is to be completed at patient follow-up 30 days (+ 2 weeks) after admission. Following may be performed by clinic visit or telephone interview.
Where check boxes ☐ are provided, check (√) one or more boxes. Where radio button ◉ are provided, check (√) one box only.

A. Name of reporting centre:	
B. Patient Name :	Hj/Hjh/Dato'/Dr.
C. Identification Card Number :	*MyKad / MyKid:* ☐☐☐☐☐☐ - ☐☐ - ☐☐☐☐ *Old IC:*
	Other ID document No: *Specify type (eg.passport, armed force ID):*
D. Date of Follow up Notification:	☐☐☐☐☐☐ (dd/mm/yy)

SECTION 1: OUTCOME

1. Outcome:	1. Alive ☐	
	2. Died ☐ →	**a. Date of death:** ☐☐☐☐☐☐ (dd/mm/yy) **b. Cause of Death:** ◉ Cardiovascular ◉ Non Cardiovascular ◉ Other,specify : ----------
	3. Transferred to another centre : ☐ →	**a. Date of last follow-up:** ☐☐☐☐☐☐ (dd/mm/yy) **b. Name of Centre :**
	4. Lost to Follow up: ☐ →	**a. Date of last follow-up:** ☐☐☐☐☐☐ (dd/mm/yy)
2. Cardiovascular readmission:	1. ACS ☐ →	**a. Date :** ☐☐☐☐☐☐ (dd/mm/yy) **b. ACS Stratum:** ◉ STEMI ◉ NSTEMI ◉ UA
	2. Heart failure ☐ →	**a. Date :** ☐☐☐☐☐☐ (dd/mm/yy)
	3. Revascularization ☐ →	**a. Date :** ☐☐☐☐☐☐ (dd/mm/yy) **b. Type of Revascularization :** ☐ 1. PCI → ◉ Urgent ◉ Elective ☐ 2. CABG → ◉ Urgent ◉ Elective
	4. Stroke ☐ →	**a. Date :** ☐☐☐☐☐☐ (dd/mm/yy)

SECTION 2: CLINICAL HISTORY AND EXAMINATION (OPTIONAL)

1. Angina Status: (CCS classification)	◉ None	◉ Class I	◉ Class II	◉ Class III	◉ Class IV				
2. Functional capacity: (NYHA classification)	◉ None	◉ NYHA I	◉ NYHA II	◉ NYHA III	◉ NYHA IV				
3. BP	**a. Systolic:**	mmHg	**b. Diastolic:**	mmHg					
4. Anthropometric:	**a. Weight:**	kg	**b. Waist circumference:**	cm					
	c. Hip circumference:	cm							

SECTION 3: INVESTIGATIONS (OPTIONAL)

	Values	Unit
1. Lipid profile:		
a. Total cholesterol:		mmol/L
b. HDL-C:		mmol/L
c. LDL-C:		mmol/L
d. Triglycerides:		mmol/L
2. Left Ventricular Ejection Fraction:		%

SECTION 4: MEDICATIONS (OPTIONAL)

Group	Given		Group	Given	
1. ASA	◉ Yes	◉ No	**9. Statin**	◉ Yes	◉ No
2. ADP antagonist	◉ Yes	◉ No	**10. Other lipid lowering agent**	◉ Yes	◉ No
3. GP receptor inhibitor	◉ Yes	◉ No	**11. Diuretics**	◉ Yes	◉ No
4. Warfarin	◉ Yes	◉ No	**12. Calcium antagonist**	◉ Yes	◉ No
5. LMWH	◉ Yes	◉ No	**13. Oral Hypoglycaemic agent**	◉ Yes	◉ No
6. Beta blocker	◉ Yes	◉ No	**14. Insulin**	◉ Yes	◉ No
7. ACE Inhibitor	◉ Yes	◉ No	**15. Anti-arrhythmic agent**	◉ Yes	◉ No
8. Angiotensin II receptor blocker	◉ Yes	◉ No			

SECTION 5: REHABILITATION AND COUNSELLING (OPTIONAL)

1. Was patient referred to cardiac rehabilitation?	◉ Yes	◉ No
2. Has patient stopped smoking?	◉ Yes	◉ No

NATIONAL CARDIOVASCULAR DISEASE DATABASE
FOLLOW UP FORM AT 1 YEAR

For NCVD Use only:
ID: /
Centre:

Instruction: This form is to be completed at patient follow-up 1 year ± 1 month after admission. Following may be performed by clinic visit or telephone interview.
Where check boxes ☐ are provided, check (√) one or more boxes. Where radio button ◉ are provided, check (√) one box only.

A. Name of reporting centre:			
B. Patient Name :	Hj/Hjh/Dato'/Dr.		
C. Identification Card Number :	*MyKad / MyKid:*	- -	*Old IC:*
	Other ID document No:		*Specify type (eg.passport, armed force ID):*
D. Date of Follow up Notification:	(dd/mm/yy)		

SECTION 1: OUTCOME

1. Outcome:	1. Alive ☐	
	2. Died ☐ →	**a. Date of death:** (dd/mm/yy) **b. Cause of Death:** ◉ Cardiovascular ◉ Non Cardiovascular ◉ Other,specify :
	3. Transferred to another centre : ☐ →	**a. Date of last follow-up:** (dd/mm/yy) **b. Name of Centre :**
	4. Lost to Follow up: ☐ →	**a. Date of last follow-up:** (dd/mm/yy)
2. Cardiovascular readmission:	1. ACS ☐ →	**a. Date :** (dd/mm/yy) **b. ACS Stratum:** ◉ STEMI ◉ NSTEMI ◉ UA
	2. Heart failure ☐ →	**a. Date :** (dd/mm/yy)
	3. Revascularization ☐ →	**a. Date :** (dd/mm/yy) **b. Type of Revascularization :** ☐ 1. PCI → ◉ Urgent ◉ Elective ☐ 2. CABG → ◉ Urgent ◉ Elective
	4. Stroke ☐ →	**a. Date :** (dd/mm/yy)

SECTION 2: CLINICAL HISTORY AND EXAMINATION

1. Angina Status: (CCS classification)	◉ None	◉ Class I	◉ Class II	◉ Class III	◉ Class IV	
2. Functional capacity: (NYHA classification)	◉ None	◉ NYHA I	◉ NYHA II	◉ NYHA III	◉ NYHA IV	
3. BP	**a. Systolic:**	mmHg	**b. Diastolic:**	mmHg		
4. Anthropometric:	**a. Weight:**	kg	**b. Waist circumference:**	cm		
	c. Hip circumference:	cm				

SECTION 3: INVESTIGATIONS

	Values	Unit
1. Lipid profile:		
a. Total cholesterol:		mmol/L
b. HDL-C:		mmol/L
c. LDL-C:		mmol/L
d. Triglycerides:		mmol/L
2. Left Ventricular Ejection Fraction:		%

SECTION 4: MEDICATIONS

Group	Given		Group	Given	
1. ASA	◉ Yes	◉ No	**9. Statin**	◉ Yes	◉ No
2. ADP antagonist	◉ Yes	◉ No	**10. Other lipid lowering agent**	◉ Yes	◉ No
3. GP receptor inhibitor	◉ Yes	◉ No	**11. Diuretics**	◉ Yes	◉ No
4. Warfarin	◉ Yes	◉ No	**12. Calcium antagonist**	◉ Yes	◉ No
5. LMWH	◉ Yes	◉ No	**13. Oral Hypoglycaemic agent**	◉ Yes	◉ No
6. Beta blocker	◉ Yes	◉ No	**14. Insulin**	◉ Yes	◉ No
7. ACE Inhibitor	◉ Yes	◉ No	**15. Anti-arrhythmic agent**	◉ Yes	◉ No
8. Angiotensin II receptor blocker	◉ Yes	◉ No			

SECTION 5: REHABILITATION AND COUNSELLING

1. Was patient referred to cardiac rehabilitation?	◉ Yes	◉ No
2. Has patient stopped smoking?	◉ Yes	◉ No