

CHAPTER 5: OUTCOME

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Summary

1. There was improvement in the overall 30-day outcome compared to the last NCVD-ACS Registry in 2006-2010.
2. STEMI remained as the highest risk of mortality. Advanced age, female gender and higher TIMI risk score and Killip class were identified as predictors of mortality.
3. Patients who received fibrinolytic therapy had better outcome than those who did not.
4. Hospitals with cardiac catheterisation facility registered lower in-hospital and 30-day mortality.
5. Patients who underwent urgent cardiac catheterisation and urgent PCI had better outcome than those who did not.

Overall in-hospital and 30-day mortality

From the year 2011 to 2013, the overall (all-cause) in-hospital and 30-day mortality rate had been constant at around 7.6% and 9%, respectively. [Table 5.1] There was no obvious change in the trend of mortality across all ACS stratum within this three-year period. The STEMI group appeared to have the highest mortality rate. In-hospital mortality for STEMI was (10.6%) followed by NSTEMI (7.6%) and UA (1.2%). The 30-day mortality for STEMI was (11.8%) followed by NSTEMI (9.2%) and UA (2.4%). [Table 5.8] There was similar in-hospital outcome between patients treated at physician and cardiologist centres. However, we noted a slightly favourable outcome in the patients treated at the cardiologist-centre at 30-day (mortality physician 9.2% vs. cardiologist 8.2%). [Table 5.7] There was a marked improvement in the overall 30-day mortality rate compared to our previous 2006 to 2010 registry (9% vs. 14%)¹. Nevertheless, our overall mortality rate was still far higher than that of other worldwide registries²⁻⁴.

Outcome by Patients Characteristics

STEMI

Multivariate analysis of patients' baseline characteristics showed that female gender, higher Killip class at presentation and age >60 years were poor prognostic factors for in-hospital mortality. No significant difference was noted in adjusted mortality among the three major ethnic groups. Within all the conventional cardiovascular risk factors, we found that hypertensives and HF had higher adjusted mortality. The adjusted mortality risk was also higher with higher TIMI risk score. [Table 5.11.1]

NSTEMI/UA

The adjusted mortality showed that age was an important determinant of in-hospital mortality. Female gender seemed to have similar outcome compared to their male counterpart unlike the STEMI group and the Indian ethnic group had a better outcome compared to the Malays and Chinese. Higher Killip class also conferred poorer outcome in this group of patients. Among the cardiovascular risk factors, diabetes mellitus was associated with a significantly worse outcome. [Table 5.11.2]



Outcome of patients by treatment

STEMI

Patients who received fibrinolytics and in-hospital PCI achieved a better survival rate at discharge and 30-day post discharge than those who did not receive thrombolytics. Patients who had PCI seemed to do better compared to those treated with fibrinolytics but any definite conclusion required further evaluation as there bound to be overlap between the two groups. [Table 5.11.1 & 5.11.3]

NSTEMI/UA

Patients who had cardiac catheterisation had a better outcome at in-hospital and 30-day period. [Table 5.11.2 & 5.11.4] Those who underwent CABG had a poorer outcome at discharge but the 30-day outcome was favourable for this group of patients as the mortality rate after discharge until 30-day follow up was 0% across the study period (in-hospital mortality equals to 30-day mortality). [Table 5.10.2]

Significant Prognostic Factors

Age

Age was a very significant determinant particularly for patients with UA/NSTEMI. For UA/NSTEMI compared to younger aged patients (20-40 years old), those aged between 40-60 years and above 60 years had a hazard ratio of 9.31 and 17.16 for in-hospital mortality, and 10.61 and 20.45 for 30-day mortality, respectively. [Table 5.11.2 & 5.11.4]

Gender

Compared to men, women appeared to have marginally but significantly higher risk of mortality after STEMI. [Table 5.11.1 & 5.11.3]

Ethnicity

Using Malays (the predominant group) as the standard, patients of Indian origin had significantly lower risk for NSTEMI/UA whereas patients not belonging to the three main ethnic groups (such as Orang Asli, Kadazan, Melanau, Murut, Bajau, Bidayuh, Iban, other Malaysian and foreigner groups) had lower risk for STEMI only. There was no difference between Chinese and Malays for STEMI and NSTEMI/UA. [Table 5.11.1 & 5.11.2]

Killip Class

Killip Class was an important determinant of mortality. Patients in Killip Class IV had hazard ratio up to 3.49 compared to class I in STEMI and 7.21 in NSTEMI/UA. [Table 5.11.1 & 5.11.2]

PCI and cardiac catheterisation

Patients who underwent cardiac catheterisation during index admission had better outcome than those who did not. This was most obvious for NSTEMI/UA for in-hospital mortality [HR 0.45 (95%CI 0.34-0.59)]. For STEMI, patients who underwent PCI on same admission had lower risk of in-hospital and 30-day mortality. [Table 5.11.1, 5.11.2 & 5.11.3]

Fibrinolytic therapy

For patients with STEMI, the use of fibrinolytic therapy was associated with significantly lower in-hospital and 30-day mortality. [Table 5.11.1 & 5.11.3]

TIMI Risk Score for STEMI

The TIMI risk score continued to be a useful predictor of mortality for patients with STEMI. [Table 5.11.1 & 5.11.3]

References:

1. W.A Wan Ahmad, KH Sim (Eds.) NCVD. Annual Report of the NCVD-ACS Registry 2009 & 2010. Kuala Lumpur, Malaysia :National Cardiovascular Disease Database, 2013.
2. Goodman SG, Huang W, Yan AT et al; GRACE2 Investigators. The expanded Global Registry of Acute Coronary Events: Baseline characteristics, management practices, and hospital outcomes of patients with acute coronary syndromes. *Am Heart J* 2009; 158:193-201
3. Zabaïd 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
4. Hassen 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, 2011-2013

	+Outcome	Overall outcome			
		Outcome at discharge		30-day*	
		No.	%	No.	%
2011	Alive	3,729	92.2	3,681	91.0
	Death	318	7.8	366	9.0
2012	Alive	4,234	92.2	4,173	91.0
	Death	355	7.8	416	9.0
2013	Alive	5,670	92.6	5,586	91.2
	Death	457	7.4	541	8.8
2011 - 2013	Alive	13,633	92.4	13,440	91.0
	Death	1130	7.6	1323	9.0

+ 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, 2011-2013

	+Outcome	In-hospital						30-day*					
		Young		Middle-age		Elderly		Young		Middle-age		Elderly	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
2011	Alive	236	96.8	1,896	94.8	1,597	88.6	234	96.0	1,883	94.2	1,564	86.6
	Died	8	3.2	103	5.2	207	11.4	10	4.0	116	5.8	240	13.4
2012	Alive	300	97.8	2,119	95.8	1,815	87.6	299	97.4	2,101	95.0	1,773	85.6
	Died	7	2.2	92	4.2	256	12.4	8	2.6	110	5.0	298	14.4
2013	Alive	398	97.8	2889	95.0	2383	89.0	395	97.0	2859	94.0	2332	87.2
	Died	9	2.2	155	5.0	293	11.0	12	3.0	185	6.0	344	12.8
2011 - 2013	Alive	934	97.4	6904	95.2	5795	88.4	928	96.8	6843	94.4	5669	86.6
	Died	24	2.6	350	4.8	756	11.6	30	3.2	411	5.6	882	13.4

+ 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, 2011-2013

	+Outcome	In-hospital				30-day*			
		Male		Female		Male		Female	
		No.	%	No.	%	No.	%	No.	%
2011	Alive	2,913	92.6	816	90.4	2,882	91.6	799	88.6
	Died	232	7.4	86	9.6	263	8.4	103	11.4
2012	Alive	3,381	93.2	853	88.8	3,341	92.0	832	86.6
	Died	247	6.8	108	11.2	287	8.0	129	13.4
2013	Alive	4,536	93.2	1,134	89.8	4,473	92.0	1,113	88.2
	Died	329	6.8	128	10.2	392	8.0	149	11.8
2011 - 2013	Alive	10,830	93.0	2,803	89.6	10,696	92.0	2,744	87.8
	Died	808	7.0	322	10.4	942	8.0	381	12.2

+ 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, 2011-2013

	+Outcome	In-hospital						30-day*					
		Yes		No		Unknown		Yes		No		Unknown	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
2011	Alive	1,587	91.2	1,690	92.8	180	90.0	1,559	89.4	1,675	92.0	179	89.5
	Died	155	8.8	131	7.2	20	10.0	183	10.6	146	8.0	21	10.5
2012	Alive	1,798	91.0	1,885	93.2	230	93.4	1,763	89.4	1,864	92.2	229	93.0
	Died	176	9.0	138	6.8	16	6.6	211	10.6	159	7.8	17	7.0
2013	Alive	2,322	90.4	2,642	94.6	315	91.0	2,273	88.6	2,610	93.4	314	90.8
	Died	246	9.6	152	5.4	31	9.0	295	11.4	184	6.6	32	9.2
2011 - 2013	Alive	5,707	90.8	6,217	93.6	725	91.6	5,595	89.0	6,149	92.6	722	91.2
	Died	577	9.2	421	6.4	67	8.4	689	11.0	489	7.4	70	8.8

+ 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, 2011-2013

	+Outcome	In-hospital						30-day*					
		Yes		No		Not known		Yes		No		Unknown	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
2011	Alive	2,318	91.0	1,044	94.4	134	92.4	2,283	89.6	1,035	93.6	133	91.8
	Died	229	9.0	62	5.6	11	7.6	264	10.4	71	6.4	12	8.2
2012	Alive	2,562	91.6	1,171	93.0	193	95.6	2,519	90.0	1,157	91.8	192	95.0
	Died	235	8.4	88	7.0	9	4.4	278	10.0	102	8.2	10	5.0
2013	Alive	3,319	91.4	1,758	94.6	235	91.0	3,252	89.6	1,743	93.8	235	91.0
	Died	311	8.6	99	5.4	23	9.0	378	10.4	114	6.2	23	9.0
2011 - 2013	Alive	8,199	91.4	3,973	94.2	562	92.8	8,054	89.8	3,935	93.2	560	92.6
	Died	775	8.6	249	5.8	43	7.2	920	10.2	287	6.8	45	7.4

+ 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, 2011-2013

	+Outcome	In-hospital						30-day*					
		Yes		No		Not known		Yes		No		Unknown	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
2011	Alive	1,323	90.6	1,667	93.4	427	90.4	1,309	89.8	1,643	92.0	423	89.6
	Died	136	9.4	118	6.6	45	9.6	150	10.2	142	8.0	49	10.4
2012	Alive	1,435	93.4	1,988	91.8	472	92.0	1,412	91.8	1,958	90.4	467	91.0
	Died	103	6.6	177	8.2	41	8.0	126	8.2	207	9.6	46	9.0
2013	Alive	1,975	94.0	2,730	92.0	549	90.2	1,950	92.8	2,678	90.2	544	89.4
	Died	128	6.0	240	8.0	59	9.8	153	7.2	292	9.8	64	10.6
2011 - 2013	Alive	4,733	92.8	6,385	92.2	1,448	90.8	4,671	91.6	6,279	90.8	1,434	90.0
	Died	367	7.2	535	7.8	145	9.2	429	8.4	641	9.2	159	10.0

+ 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, NCD-ACS Registry, 2011-2013

	†Outcome	In-hospital				30-day*			
		Physician Centre		Cardiologist Centre		Physician Centre		Cardiologist Centre	
		No.	%	No.	%	No.	%	No.	%
2011	Alive	2,839	92.2	890	92.0	2,801	91.0	880	91.0
	Died	241	7.8	77	8.0	279	9.0	87	9.0
2012	Alive	3,368	92.2	866	92.6	3,315	90.8	858	91.8
	Died	286	7.8	69	7.4	339	9.2	77	8.2
2013	Alive	5,031	92.6	639	92.8	4,948	91.0	638	92.6
	Died	407	7.4	50	7.2	490	9.0	51	7.4
2011 - 2013	Alive	11,238	92.4	2,395	92.4	11,064	90.8	2,376	91.8
	Died	934	7.6	196	7.6	1,108	9.2	215	8.2

+ 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, NCD-ACS Registry, 2011-2013

	†Outcome	In-hospital						30-day*					
		STEMI		NSTEMI		UA		STEMI		NSTEMI		UA	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
2011	Alive	1,841	89.6	999	91.4	889	99.0	1,813	88.2	985	90.0	883	98.4
	Died	214	10.4	95	8.6	9	1.0	242	11.8	109	10.0	15	1.6
2012	Alive	2,120	88.8	1,073	93.6	1,041	98.4	2,095	87.8	1,053	91.8	1,025	97.0
	Died	266	11.2	73	6.4	16	1.6	291	12.2	93	8.2	32	3.0
2013	Alive	2,744	89.6	1,478	92.2	1,448	99.0	2,709	88.6	1,448	90.4	1,429	97.6
	Died	317	10.4	124	7.8	16	1.0	352	11.4	154	9.6	35	2.4
2011 - 2013	Alive	6,705	89.4	3,550	92.4	3,378	98.8	6,617	88.2	3,486	90.8	3,337	97.6
	Died	797	10.6	292	7.6	41	1.2	885	11.8	356	9.2	82	2.4

+ 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, 2011-2013

	+Outcome	Fibrinolytic Therapy							
		In-hospital				30-day*			
		Yes		No		Yes		No	
		No.	%	No.	%	No.	%	No.	%
2011	Alive	1,418	90.0	358	88.4	1,402	89.0	349	86.2
	Died	159	10.0	47	11.6	175	11.0	56	13.8
2012	Alive	1,521	90.2	551	85.6	1,508	89.4	540	84.0
	Died	165	9.8	92	14.4	178	10.6	103	16.0
2013	Alive	2,015	90.6	686	87.0	1,990	89.4	676	85.6
	Died	209	9.4	103	13.0	234	10.6	113	14.4
2011 - 2013	Alive	4,954	90.2	1,595	86.8	4,900	89.4	1,565	85.2
	Died	533	9.8	242	13.2	587	10.6	272	14.8

+ 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, 2011-2013

	+Outcome	Percutaneous Coronary Intervention (PCI)							
		In-hospital				30-day*			
		Yes		No		Yes		No	
		No.	%	No.	%	No.	%	No.	%
2011	Alive	376	93.8	1,096	87.4	366	91.2	1,087	86.8
	Died	25	6.2	157	12.6	35	8.8	166	13.2
2012	Alive	682	91.2	1,235	87.6	673	90.0	1,222	86.8
	Died	65	8.8	174	12.4	74	10.0	187	13.2
2013	Alive	987	92.2	1,523	88.0	972	90.8	1,504	87.0
	Died	83	7.8	206	12.0	98	9.2	225	13.0
2011 - 2013	Alive	2,045	92.2	3,854	87.8	2,011	90.6	3,813	86.8
	Died	173	7.8	537	12.2	207	9.4	578	13.2

+ 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, 2011-2013

	+Outcome	Coronary Artery Bypass Graft (CABG)							
		In-hospital				30-day*			
		Yes		No		Yes		No	
		No.	%	No.	%	No.	%	No.	%
2011	Alive	14	100.0	1,488	89.4	14	100.0	1,464	87.8
	Died	0	0	178	10.6	0	0	202	12.2
2012	Alive	14	87.5	1,749	89.6	13	81.2	1,729	88.6
	Died	2	12.5	204	10.4	3	18.8	224	11.4
2013	Alive	36	100.0	2,322	89.0	36	100.0	2,290	87.8
	Died	0	0	287	11.0	0	0	319	12.2
2011 - 2013	Alive	64	97.0	5,559	89.2	63	95.4	5,483	88.0
	Died	2	3.0	669	10.8	3	4.6	745	12.0

+ 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, 2011-2013

	+Outcome	STEMI by pre-admission aspirin use							
		In-hospital				30-day*			
		Yes		No		Yes		No	
		No.	%	No.	%	No.	%	No.	%
2011	Alive	326	87.4	1,423	90.0	319	85.6	1,402	88.6
	Died	47	12.6	158	10.0	54	14.4	179	11.4
2012	Alive	400	88.0	1,625	89.6	395	86.8	1,605	88.6
	Died	55	12.0	188	10.4	60	13.2	208	11.4
2013	Alive	521	86.6	2,094	90.6	513	85.2	2,067	89.4
	Died	81	13.4	219	9.4	89	14.8	246	10.6
2011 - 2013	Alive	1,247	87.2	5,142	90.0	1,227	85.8	5,074	89.0
	Died	183	12.8	565	10.0	203	14.2	633	11.0

+ 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, 2011-2013

	†Outcome	Percutaneous Coronary Intervention (PCI)							
		In-hospital				30-day*			
		Yes		No		Yes		No	
		No.	%	No.	%	No.	%	No.	%
2011	Alive	248	96.8	1,103	92.6	247	96.4	1,090	91.4
	Died	8	3.2	89	7.4	9	3.6	102	8.6
2012	Alive	300	96.4	1,387	95.4	297	95.4	1,358	93.4
	Died	11	3.6	67	4.6	14	4.6	96	6.6
2013	Alive	402	97.2	2,253	95.4	399	96.4	2,211	93.6
	Died	12	2.8	110	4.6	15	3.6	152	6.4
2011 - 2013	Alive	950	96.8	4,743	94.6	943	96.2	4,659	93.0
	Died	31	3.2	266	5.4	38	3.8	350	7.0

+ 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, 2011-2013

	†Outcome	Coronary Artery Bypass Graft (CABG)							
		In-hospital				30-day*			
		Yes		No		Yes		No	
		No.	%	No.	%	No.	%	No.	%
2011	Alive	39	92.8	1,334	93.8	39	92.8	1,314	92.4
	Died	3	7.2	88	6.2	3	7.2	108	7.6
2012	Alive	25	89.2	1,506	95.8	25	89.2	1,474	93.8
	Died	3	10.8	66	4.2	3	10.8	98	6.2
2013	Alive	59	95.2	2,566	95.6	59	95.2	2,518	93.8
	Died	3	4.8	119	4.4	3	4.8	167	6.2
2011 - 2013	Alive	123	93.2	5,406	95.2	123	93.2	5,306	93.4
	Died	9	6.8	273	4.8	9	6.8	373	6.6

+ 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, 2011-2013

	†Outcome	Pre-admission aspirin use							
		In-hospital				30-day*			
		Yes		No		Yes		No	
		No.	%	No.	%	No.	%	No.	%
2011	Alive	888	96.4	858	93.2	880	95.6	847	92.0
	Died	33	3.6	62	6.8	41	4.4	73	8.0
2012	Alive	949	97.6	1,026	94.8	928	95.4	1,012	93.4
	Died	23	2.4	57	5.2	44	4.6	71	6.6
2013	Alive	1582	95.8	1,193	95.0	1,554	94.2	1,172	93.4
	Died	69	4.2	62	5.0	97	5.8	83	6.6
2011 - 2013	Alive	3419	96.4	3,077	94.4	3,362	94.8	3,031	93.0
	Died	125	3.6	181	5.6	182	5.2	227	7.0

† 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, 2011-2013 (Multivariable Analysis)

Factors	N	Hazard ratio	95% CI		[^] p-value
Age group, years					
20 - <40 (ref)	655	1.00			
40 - <60	4,089	1.37	0.89	2.11	0.149
≥60	2,758	1.89	1.23	2.90	0.004
Gender					
Male (ref)	6,397	1.00			
Female	1,105	1.21	1.02	1.44	0.027
*Ethnic group					
Malay (ref)	4,318	1.00			
Chinese	1,262	0.87	0.72	1.05	0.148
Indian	1,145	0.90	0.73	1.10	0.293
Others	777	0.60	0.43	0.84	0.003
Killip classification					
I (ref)	4,135	1.00			
II	1,366	1.27	1.00	1.61	0.054
III	342	1.98	1.49	2.64	<0.001
IV	983	3.49	2.82	4.31	<0.001
Not stated/inadequately described/missing	676	1.43	1.04	1.97	0.026
Percutaneous Coronary Intervention					
No (ref)	5,031	1.00			
Yes	2,471	0.74	0.58	0.94	0.015
Cardiac catheterisation					
No (ref)	4,689	1.00			
Yes	2,813	0.75	0.59	0.95	0.016
TIMI risk score					
0-2 (ref)	2,241	1.00			
3-4	2,286	1.82	1.27	2.60	0.001
5-7	2,322	3.37	2.39	4.76	<0.001
>7	653	6.40	4.40	9.31	<0.001
Fibrinolytic therapy					
Not given (ref)	1,875	1.00			
Given	5,627	0.77	0.66	0.90	0.001



Factors	N	Hazard ratio	95% CI		^p-value
Smoking					
Never (ref)	2,241				
Former (quit >30 days)	1,283				
Current (any tobacco use within last 30 days)	3,825				
Unknown	153				
Family history of premature cardiovascular disease					
No (ref)	5,326	1.00			
Yes	957	1.04	0.79	1.37	0.790
Unknown	1,219	1.26	1.05	1.51	0.011
Dyslipidaemia					
No (ref)	4,133				
Yes	2,224				
Unknown	1,145				
Hypertension					
No (ref)	2,774	1.00			
Yes	4,259	1.41	1.16	1.72	<0.001
Unknown	469	0.63	0.40	1.01	0.055
Diabetes					
No (ref)	3,913	1.00			
Yes	3,016	1.19	1.00	1.42	0.052
Unknown	573	1.39	0.95	2.02	0.086
Heart failure					
No (ref)	6,803	1.00			
Yes	277	1.42	1.11	1.82	0.006
Unknown	422	0.89	0.67	1.19	0.431

* 'Others' includes Orang Asli, Kadazan, Melanau, Murut, Bajau, Bidayuh, Iban, other Malaysian and Foreigner
 ^ using Cox regression with backward stepwise variable selection



Table 5.11.2 Prognostic factors for death in hospital among NSTEMI/UA patients, NCVD-ACS Registry, 2011-2013 (Multivariable analysis)

Factors	N	Hazard ratio	95% CI		[^] p-value
Age group, years					
20 - <40 (ref)	303	1.00			
40 - <60	3,165	9.31	1.29	67.03	0.027
≥60	3,793	17.16	2.40	122.70	0.005
Gender					
Male (ref)	5,241				
Female	2,020				
*Ethnic group					
Malay (ref)	3,141	1.00			
Chinese	1,912	1.02	0.79	1.31	0.885
Indian	1,759	0.67	0.49	0.91	0.011
Others	449	0.97	0.59	1.58	0.897
Killip classification code					
I (ref)	3,906	1.00			
II	1,002	1.48	1.06	2.06	0.021
III	296	2.67	1.80	3.96	<0.001
IV	370	7.21	5.44	9.56	<0.001
Not stated/inadequately described	1,687	0.93	0.66	1.32	0.686
Percutaneous Coronary Intervention					
No (ref)	5,882				
Yes	1,379				
Cardiac catheterization					
No (ref)	5,115	1.00			
Yes	2,146	0.45	0.34	0.59	<0.001
TIMI risk score					
0-2 (ref)	4,249				
3-4	2,642				
5-7	370				
Smoking					
Never (ref)	3,297				
Former (quit >30 days)	1,874				
Current (any tobacco use within last 30 days)	1,789				
Unknown	301				



Factors	N	Hazard Ratio	95% CI		^p-value
Family history of premature cardiovascular disease					
No (ref)	4,924				
Yes	993				
Unknown	1,344				
Dyslipidaemia					
No (ref)	3,347				
Yes	3,340				
Unknown	574				
Hypertension					
No (ref)	1,703				
Yes	5,390				
Unknown	168				
Diabetes					
No (ref)	3,208	1.00			
Yes	3,787	1.55	1.18	2.02	0.002
Unknown	266	1.09	0.62	1.94	0.760
Heart failure					
No (ref)	6,104				
Yes	780				
Unknown	377				

* 'Others' includes Orang Asli, Kadazan, Melanau, Murut, Bajau, Bidayuh, Iban, other Malaysian and Foreigner
 ^using Cox regression with backward stepwise variable selection



Table 5.11.3 Prognostic factors for death within 30 days among STEMI patients, NCVD-ACS Registry, 2011-2013 (Multivariable analysis)

Factors	N	Hazard Ratio	95% CI		[^] p-value
Age group, years					
20 - <40 (ref)	655	1.00			
40 - <60	4,089	1.21	0.82	1.78	0.328
≥60	2,758	1.75	1.19	2.58	0.004
Gender					
Male (ref)	6,397	1.00			
Female	1,105	1.21	1.03	1.42	0.020
*Ethnic group					
Malay (ref)	4,318	1.00			
Chinese	1,262	0.87	0.72	1.04	0.118
Indian	1,145	0.89	0.74	1.09	0.267
Others	777	0.61	0.44	0.85	0.004
Killip classification code					
I (ref)	4,135	1.00			
II	1,366	1.32	1.05	1.64	0.015
III	342	2.34	1.80	3.04	<0.001
IV	983	3.77	3.09	4.60	<0.001
Not stated/inadequately described	676	1.48	1.09	2.01	0.012
Percutaneous Coronary Intervention					
No (ref)	5,031	1.00			
Yes	2,471	0.73	0.58	0.92	0.008
Cardiac catheterization					
No (ref)	4,689	1.00			
Yes	2,813	0.84	0.67	1.04	0.111
TIMI risk score					
0-2 (ref)	2,241	1.00			
3-4	2,286	1.78	1.29	2.46	<0.001
5-7	2,322	3.20	2.34	4.38	<0.001
>7	653	6.16	4.36	8.70	<0.001
Fibrinolytic therapy					
Not given (ref)	1,875	1.00			
Given	5,627	0.78	0.67	0.90	0.001



Factors	N	Hazard Ratio	95% CI		^p-value
Smoking					
Never (ref)	2,241				
Former (quit >30 days)	1,283				
Current (any tobacco use within last 30 days)	3,825				
Unknown	153				
Family history of premature cardiovascular disease					
No (ref)	5,326	1.00			
Yes	957	1.00	0.77	1.30	0.997
Unknown	1,219	1.25	1.05	1.49	0.011
Dyslipidaemia					
No (ref)	4,133				
Yes	2,224				
Unknown	1,145				
Hypertension					
No (ref)	2,774	1.00			
Yes	4,259	1.39	1.16	1.67	<0.001
Unknown	469	0.70	0.46	1.09	0.112
Diabetes					
No (ref)	3,913	1.00			
Yes	3,016	1.28	1.09	1.51	0.003
Unknown	573	1.33	0.93	1.92	0.120
Heart failure					
No (ref)	6,803	1.00			
Yes	277	1.53	1.20	1.94	0.001
Unknown	422	0.99	0.75	1.31	0.969

* 'Others' includes Orang Asli, Kadazan, Melanau, Murut, Bajau, Bidayuh, Iban, other Malaysian and Foreigner
 ^ using Cox regression with backward stepwise variable selection



Table 5.11.4 Prognostic factors for death within 30 days among NSTEMI/UA patients, NCVD-ACS Registry, 2011-2013 (Multivariable analysis)

Factors	N	Hazard ratio	95% CI		[^] p-value
Age group, years					
20 - <40 (ref)	303	1.00			
40 - <60	3,165	10.61	1.48	76.17	0.019
≥60	3,793	20.45	2.86	146.28	0.003
Gender					
Male (ref)	5,241				
Female	2,020				
*Ethnic group					
Malay (ref)	3,141	1.00			
Chinese	1,912	1.00	0.81	1.25	0.974
Indian	1,759	0.67	0.51	0.88	0.003
Others	449	0.94	0.58	1.54	0.818
Killip classification code					
I (ref)	3,906	1.00			
II	1,002	1.66	1.26	2.18	<0.001
III	296	2.80	1.95	4.03	<0.001
IV	370	7.73	5.97	10.01	<0.001
Not stated/inadequately described	1,687	1.02	0.76	1.36	0.896
Percutaneous Coronary Intervention					
No (ref)	5,882				
Yes	1,379				
Cardiac catheterisation					
No (ref)	5,115	1.00			
Yes	2,146	0.67	0.52	0.85	0.001
TIMI risk score					
0-2 (ref)	4,249				
3-4	2,642				
5-7	370				
Smoking					
Never (ref)	3,297	1.00			
Former (quit >30 days)	1,874	1.40	1.08	1.80	0.010
Current (any tobacco use within last 30 days)	1,789	1.18	0.90	1.54	0.230
Unknown	301	1.17	0.76	1.79	0.471



Factors	N	Hazard ratio	95% CI		^p-value
Family history of premature cardiovascular disease					
No (ref)	4,924				
Yes	993				
Unknown	1,344				
Dyslipidaemia					
No (ref)	3,347				
Yes	3,340				
Unknown	574				
Hypertension					
No (ref)	1,703				
Yes	5,390				
Unknown	168				
Diabetes					
No (ref)	3,208	1.00			
Yes	3,787	1.68	1.33	2.14	<0.001
Unknown	266	0.75	0.41	1.38	0.361
Heart failure					
No (ref)	6,104	1.00			
Yes	780	1.36	1.04	1.78	0.023
Unknown	377	1.01	0.66	1.53	0.981

* 'Others' includes Orang Asli, Kadazan, Melanau, Murut, Bajau, Bidayuh, Iban, other Malaysian and Foreigner
 ^ using Cox regression with backward stepwise variable selection