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Supporting Information

Supplementary methods and results

This appendix was part of the submitted manuscript and has been peer reviewed. It is posted as supplied by the authors.

Appendix to: Ayad M, Hyun K, D'Souza M, et al. Factors that influence whether patients with acute coronary syndromes undergo cardiac catheterisation. *Med J Aust* 2021; doi: 10.5694/mja2.50997.

Factors included in the multivariable logistic regression models performed in the framework of Generalised Estimating Equations

For the in-hospital outcomes, the main effects in the models were: cardiac catheterisation, age (4 groups), sex, Indigenous status, diabetes, peripheral artery disease, history of myocardial infarction, congestive heart failure, chronic renal failure, dementia, acute coronary syndrome diagnosis, hospital with catheterisation laboratory available, rural hospital and size of the hospital (number of beds in 3 groups).

For the follow-up outcomes, the main effects in the models were: cardiac catheterisation, age (4 groups), sex, indigenous status, diabetes, peripheral artery disease, history of myocardial infarction, congestive heart failure, chronic renal failure, dementia, acute coronary syndrome diagnosis, referral to cardiac rehabilitation program, prescription of four or more of the five evidence based medications at discharge, hospital with catheterisation laboratory available, rural hospital and size of the hospital (number of beds in 3 groups).

Table 1. Participating catheterisation-capable and catheterisation non-capable hospitals

Catheterisation-capable hospitals		Catheterisation non-capable hospitals	
Hospital	**Urban/rural**	**Hospital**	**Urban/rural**
Alfred (Vic)	Urban	Alice Springs (NT)	Rural
Austin Hospital (VIC)	Urban	Bairnsdale Regional (VIC)	Rural
Barwon-Geelong Hospital (VIC)	Urban	Bankstown (NSW)*	Urban
Box Hill (VIC)	Urban	Bathurst (NSW)	Rural
Canberra Hospital (ACT)	Urban	Campbelltown Hospital (NSW)*	Urban
Coffs Harbour (NSW)	Rural	Canterbury Hospital (NSW)	Urban
Concord Repatriation General Hospital (NSW)	Urban	Dubbo Base Hospital (NSW)	Rural
Flinders Medical Centre (SA)	Urban	Maitland Hospital (NSW)	Urban
Gold Coast (QLD)	Urban	Nambour General (QLD)	Rural
John Hunter (NSW)	Urban	Nowra, Shoalhaven Memorial District (NSW)	Rural
Launceston General Hospital (TAS)	Rural	Port Macquarie Hospital (NSW)*	Rural
Lismore (NSW)	Rural	Toowoomba Hospital (QLD)	Rural
Liverpool Hospital (NSW)	Urban		
Lyell McEwin Hospital (SA)	Urban		
Monash Heart (VIC)	Urban		
Nepean Hospital (NSW)	Urban		
Orange Base Hospital (NSW)	Rural		
Prince Charles Hosptial (QLD)	Urban		
Royal Brisbane & Women's hospital (QLD)	Urban		
Royal Darwin (NT) Royal Hobart (TAS)	Rural Rural		
Royal Perth (WA)	Urban		
Royal Prince Alfred (NSW)	Urban		
Sir Charles Gairdner Hospital (WA)	Urban		
St George Hospital (NSW) St Vincents (Vic)	Urban Urban		
The Northern Hospital (VIC)	Urban		
The Queen Elizabeth (SA)	Urban		
Townsville Hospital (QLD)	Rural		
Westmead (NSW)	Urban		
Wollongong (NSW)	Urban		

* These hospitals have acquired catheterisation laboratories subsequent to their participation in the CONCORDANCE registry.

Table 2. Baseline characteristics of 6389 patients who underwent cardiac catheterisation, by hospital of initial presentation

Characteristic	Catheterisation-capable hospital	Catheterisation non-capable hospital	Total
Number of patients	4557	1832	6389
Age (years), mean (SD)	63.9 (12.8)	64.5 (12.7)	64.1 (12.8)
Sex (women)	1200 (26%)	562 (31%)	1762 (28%)
Body mass index (kg/m^2)			
< 18 (underweight)	26 (1%)	12 (1%)	38 (1%)
18 to < 25 (healthy)	825 (25%)	248 (25%)	1073 (25%)
25 to < 30 (overweight)	1319 (40%)	373 (37%)	1692 (39%)
≥ 30 (obese)	1127 (34%)	377 (37%)	1504 (35%)
Indigenous Australians	147 (3%)	120 (7%)	267 (4%)
Comorbid conditions			
Hypertension	2650 (58%)	1146 (63%)	3796 (60%)
Diabetes	1154 (25%)	519 (28%)	1673 (26%)
Dyslipidaemia	2418 (53%)	1034 (56%)	3452 (54%)
Peripheral arterial disease	222 (5%)	96 (5%)	318 (5%)
Prior myocardial infarction	1135 (25%)	518 (28%)	1653 (26%)
Prior percutaneous coronary intervention	901 (20%)	366 (20%)	1267 (20%)
Prior coronary artery bypass graft	376 (8%)	179 (10%)	555 (9%)
Prior heart failure	233 (5%)	78 (4%)	311 (5%)
Prior stroke/transient ischemic attack	262 (6%)	141 (8%)	403 (6%)
Chronic renal failure	248 (5%)	151 (8%)	399 (6%)
Dementia/cognitive impairment	72 (2%)	36 (2%)	108 (2%)
Killip class			
1	4130 (91%)	1664 (91%)	5794 (91%)
2	350 (8%)	122 (7%)	472 (7%)
3	55 (1%)	41 (2%)	96 (2%)
4	22 (<1%)	5 (<1%)	27 (<1%)
GRACE risk score, mean (SD)	106 (30)	105 (30)	106 (30)
Diagnosis			
ST-elevation myocardial infarction	1698 (37%)	454 (25%)	2152 (34%)
Non-ST-elevation myocardial infarction	2169 (48%)	1067 (58%)	3236 (51%)
Unstable angina	688 (15%)	311 (17%)	999 (16%)
Percutaneous coronary intervention	2721 (60%)	904 (49%)	3625 (57%)
Percutaneous coronary intervention: type			
Primary	1601 [59%]	104 [12%]	1705 [47%]
Rescue	169 [6%]	167 [18%]	336 [9%]
Other	950 [35%]	633 [70%]	1583 [44%]
In-hospital low heparin	2087 (46%)	1235 (67%)	3322 (52%)
In-hospital statin	4217 (93%)	1613 (88%)	5830 (91%)
Discharge medications			
Aspirin	4069 (89%)	1625 (89%)	5694 (89%)
Clopidogrel	1983 (44%)	967 (53%)	2950 (46%)
Prasugrel	295 (6%)	35 (2%)	330 (5%)
Ticagrelor	1032 (23%)	272 (15%)	1304 (20%)
Coplavix (clopidogrel/aspirin)	177 (4%)	46 (3%)	223 (3%)
Lipid-lowering agent	4220 (93%)	1658 (91%)	5878 (92%)

Characteristic	Catheterisation-capable hospital	Catheterisation non-capable hospital	Total
Beta blocker	3520 (77%)	1384 (76%)	4904 (77%)
Angiotensin-converting enzyme inhibitors or angiotensin receptor blockers	3287 (72%)	1281 (70%)	4568 (71%)
Anticoagulant	347 (8%)	169 (9%)	516 (8%)
Triple therapy at discharge	147 (3%)	52 (3%)	199 (3%)
Four or more evidence-based medicine types	3508 (77%)	1333 (73%)	4841 (76%)
Referral to cardiac rehabilitation	3233 (71%)	1327 (73%)	4560 (72%)

SD = standard deviation.

Table 3. Baseline characteristics of patients who did not undergo cardiac catheterisation, by hospital of initial presentation

Characteristic	Catheterisation-capable hospital	Catheterisation non-capable hospital	Total
Number of patients	1080	776	1856
Age (years), mean (SD)	71.3 (14.1)	71.8 (14.1)	71.5 (14.1)
Sex (women)	375 (35%)	311 (40%)	686 (37%)
Body mass index (kg/m^2)			
< 18 (underweight)	12 (2%)	9 (3%)	21 (2%)
18 to < 25 (healthy)	163 (31%)	96 (30%)	259 (31%)
25 to < 30 (overweight)	171 (33%)	115 (36%)	286 (34%)
≥ 30 (obese)	179 (34%)	103 (32%)	282 (33%)
Indigenous Australians	52 (5%)	82 (11%)	134 (7%)
Comorbid conditions			
Hypertension	821 (76%)	584 (75%)	1405 (76%)
Diabetes	396 (37%)	290 (37%)	686 (37%)
Dyslipidaemia	707 (66%)	504 (65%)	1211 (65%)
Peripheral arterial disease	114 (11%)	92 (12%)	206 (11%)
Prior myocardial infarction	570 (53%)	404 (52%)	974 (52%)
Prior percutaneous coronary intervention	334 (31%)	269 (35%)	603 (32%)
Prior coronary artery bypass graft	286 (26%)	171 (22%)	457 (25%)
Prior heart failure	219 (20%)	151 (19%)	370 (20%)
Prior stroke/transient ischemic attack	147 (14%)	101 (13%)	248 (13%)
Chronic renal failure	190 (18%)	159 (20%)	349 (19%)
Dementia/cognitive impairment	89 (8%)	67 (9%)	156 (8%)
Killip class			
1	825 (76%)	638 (82%)	1463 (79%)
2	188 (17%)	108 (14%)	296 (16%)
3	45 (4%)	24 (3%)	69 (4%)
4	22 (2%)	6 (1%)	28 (2%)
GRACE risk score, mean (SD)	118 (39)	118 (36)	118 (38)
Cardiac arrest on admission	53 (5%)	41 (5%)	94 (5%)
Diagnosis			
ST-elevation myocardial infarction	88 (8%)	56 (7%)	144 (8%)
Non-ST-elevation myocardial infarction	492 (46%)	375 (48%)	867 (47%)
Unstable angina	499 (46%)	344 (44%)	843 (45%)
Revascularisation	62 (6%)	23 (3%)	85 (5%)
Coronary artery bypass graft	45 (4%)	12 (2%)	57 (3%)
Percutaneous coronary intervention	18 (2%)	11 (1%)	29 (2%)
Percutaneous coronary intervention: type			
Primary	5 [28%]	3 [30%]	8 [29%]
Rescue	1 [6%]	3 [30%]	4 [14%]
Other	12 [67%]	4 [40%]	16 [57%]
In-hospital heparin	277 (26%)	138 (18%)	415 (22%)
In-hospital low heparin	403 (37%)	386 (50%)	789 (43%)
In-hospital statin	802 (74%)	567 (73%)	1369 (74%)
Discharge medications			
Aspirin	742 (69%)	554 (71%)	1296 (70%)
Clopidogrel	405 (38%)	316 (41%)	721 (39%)

Characteristic	Catheterisation-capable hospital	Catheterisation non-capable hospital	Total
Prasugrel	7 (1%)	4 (1%)	11 (1%)
Ticagrelor	49 (5%)	46 (6%)	95 (5%)
Coplavix (clopidogrel/aspirin)	35 (3%)	23 (3%)	58 (3%)
Lipid-lowering agent	823 (76%)	585 (75%)	1408 (76%)
Beta blocker	670 (62%)	501 (65%)	1171 (63%)
Angiotensin-converting enzyme inhibitors or angiotensin receptor blockers	618 (57%)	440 (57%)	1058 (57%)
Anticoagulant	140 (13%)	113 (15%)	253 (14%)
Triple therapy at discharge	11 (1%)	10 (1%)	21 (1%)
Four or more evidence-based medicine types	525 (49%)	395 (51%)	920 (50%)
Referral to cardiac rehabilitation	255 (24%)	238 (32%)	493 (28%)

SD = standard deviation.

Table 4. Patient characteristics by follow-up status at 6 months

Variable		Followed up at 6 months	Not followed up
Number of patients		6759	1144
Age	Mean (SD)	65 (13)	65 (15)
Sex	Women	1999/6759 (30%)	335/1144 (29%)
Indigenous Australian		335/6637 (5%)	60/1108 (5%)
Hypertension		4270/6752 (63%)	710/1141 (62%)
Diabetes		1940/6759 (29%)	301/1144 (26%)
Dyslipidaemia		3858/6749 (57%)	643/1142 (56%)
Peripheral arterial disease		410/6759 (6%)	68/1144 (6%)
Prior myocardial infarction		2154/6759 (32%)	343/1144 (30%)
Previous percutaneous coronary intervention		1566/6759 (23%)	256/1144 (22%)
Previous coronary artery bypass graft		835/6759 (12%)	129/1144 (11%)
Prior heart failure		528/6759 (8%)	93/1144 (8%)
Previous stroke/transient ischemic attack		491/6759 (7%)	100/1144 (9%)
Chronic renal failure		593/6759 (9%)	89/1144 (8%)
Dementia/cognitive impairment		164/6759 (2%)	52/1144 (5%)
Killip class	1	6026/6759 (89%)	1021/1144 (89%)
	2	602/6759 (9%)	92/1144 (8%)
	3	109/6759 (2%)	30/1144 (3%)
	4	22/6759 (<1%)	1/1144 (<1%)
Cardiac arrest on admission		167/6759 (2%)	26/1144 (2%)
Diagnosis	ST-elevation myocardial infarction	1816/6759 (27%)	318/1144 (28%)
	Non-ST-elevation myocardial infarction	3370/6759 (50%)	588/1144 (51%)
	Unstable angina	1573/6759 (23%)	238/1144 (21%)

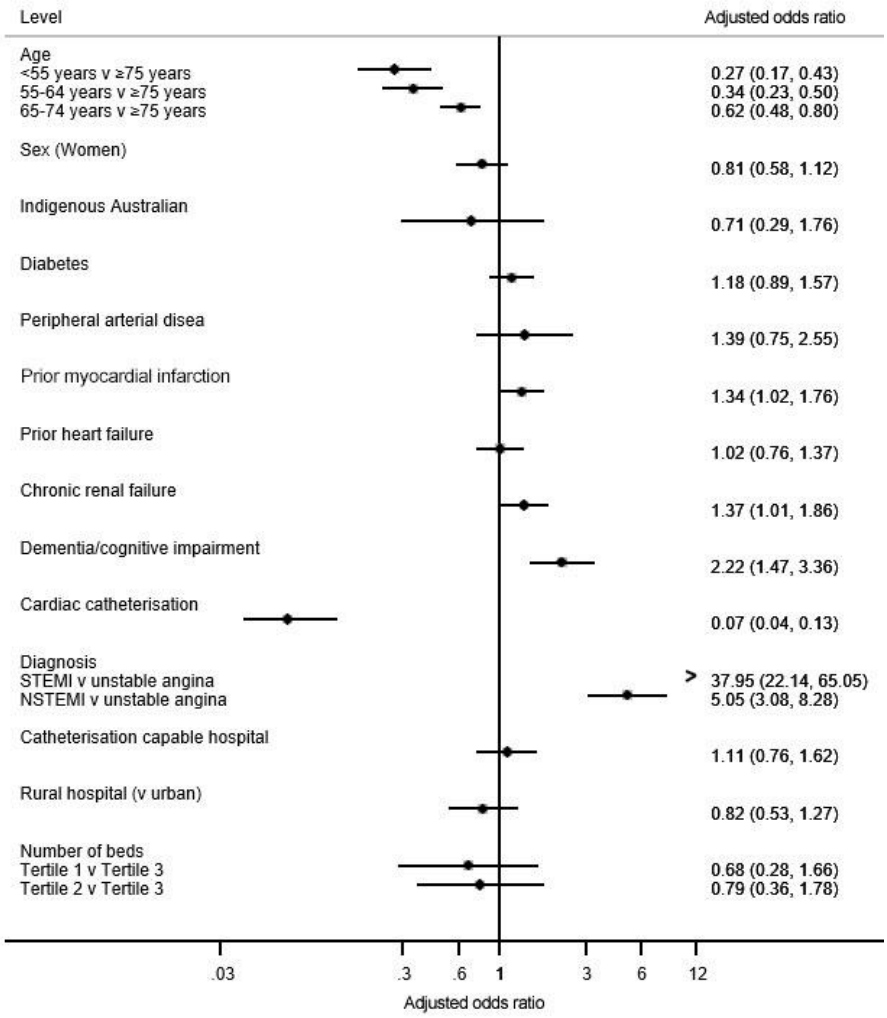
SD = standard deviation.

Table 5. Patient characteristics by follow-up status at 12 or 24 months

Variable		Followed up at 12/24 months	Not followed up
Number of patients		4979	2924
Age	Mean (SD)	65 (13)	66 (14)
Sex	Women	1450/4979 (29%)	884/2924 (30%)
Indigenous Australian		233/4888 (5%)	162/2857 (6%)
Hypertension		3115/4974 (63%)	1865/2919 (64%)
Diabetes		1400/4979 (28%)	841/2924 (29%)
Dyslipidaemia		2845/4969 (57%)	1656/2922 (57%)
Peripheral arterial disease		281/4979 (6%)	197/2924 (7%)
Prior myocardial infarction		1555/4979 (31%)	942/2924 (32%)
Previous percutaneous coronary intervention		1124/4979 (23%)	698/2924 (24%)
Previous coronary artery bypass graft		623/4979 (13%)	341/2924 (12%)
Prior heart failure		343/4979 (7%)	278/2924 (10%)
Previous stroke/transient ischemic attack		328/4979 (7%)	263/2924 (9%)
Chronic renal failure		395/4979 (8%)	287/2924 (10%)
Dementia/cognitive impairment		100/4979 (2%)	116/2924 (4%)
Killip class	1	4480/4979 (90%)	2567/2924 (88%)
	2	414/4979 (8%)	280/2924 (10%)
	3	72/4979 (1%)	67/2924 (2%)
	4	13/4979 (<1%)	10/2924 (<1%)
Cardiac arrest on admission		126/4979 (3%)	67/2924 (2%)
Diagnosis	ST-elevation myocardial infarction	1396/4979 (28%)	738/2924 (25%)
	Non-ST-elevation myocardial infarction	2436/4979 (49%)	1522/2924 (52%)
	Unstable angina	1147/4979 (23%)	664/2924 (23%)

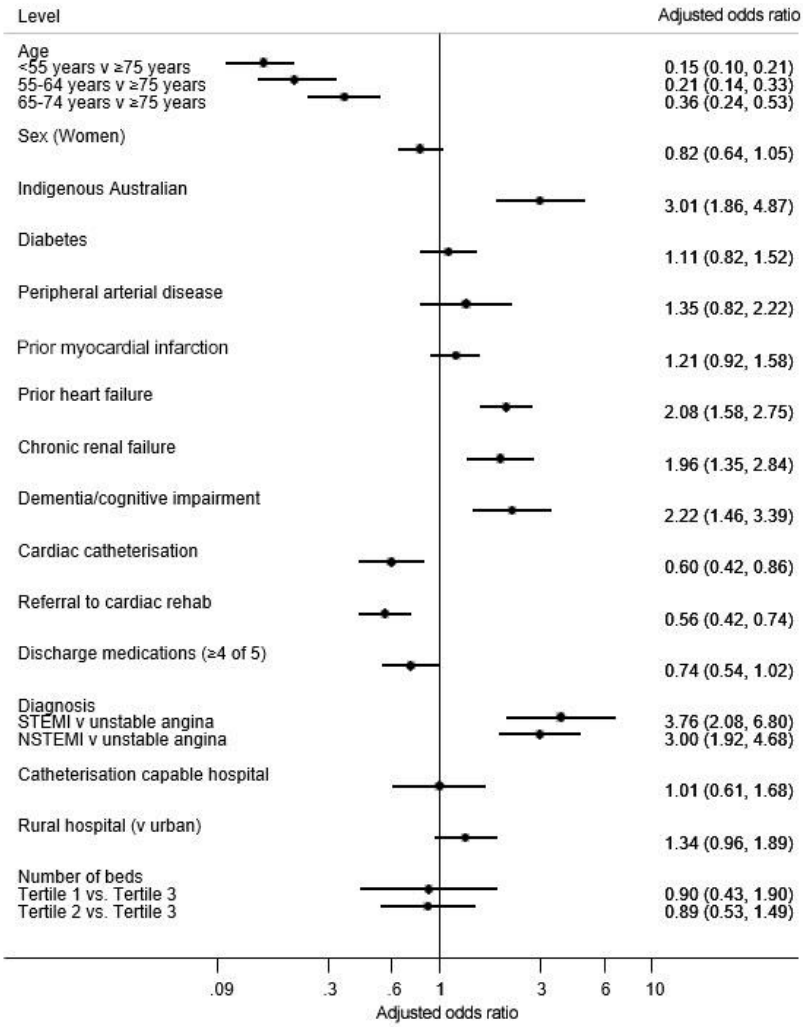
SD = standard deviation.

Figure 1. Predictors of in-hospital death: multivariable analysis



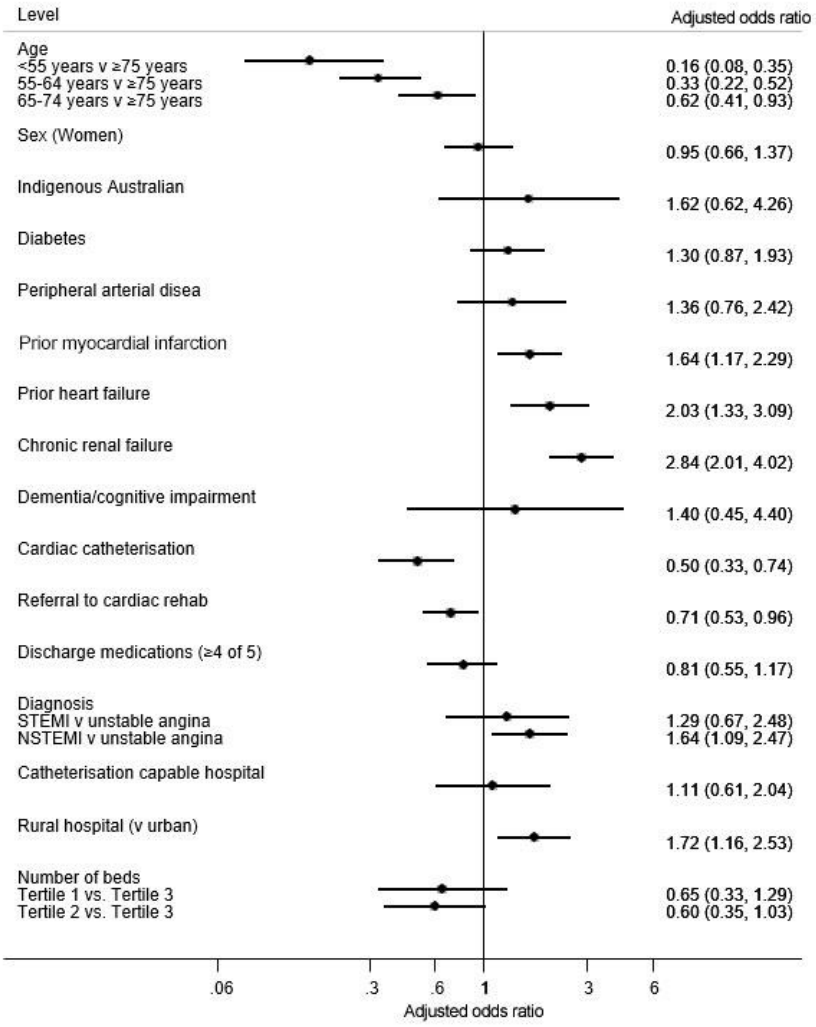
CI = confidence interval; STEMI = ST-elevation myocardial infarction, NSTEMI = non-ST-elevation myocardial infarction.

Figure 2. Predictors of death by 6-month follow-up: multivariable analysis



CI = confidence interval; STEMI = ST-elevation myocardial infarction, NSTEMI = non-ST-elevation myocardial infarction.

Figure 3. Predictors of death by 12- or 24-month follow-up: multivariable analysis



CI = confidence interval; STEMI = ST-elevation myocardial infarction, NSTEMI = non-ST-elevation myocardial infarction.