

Online Appendix

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Figure 1: STROBE diagram of progress through stages of analysis

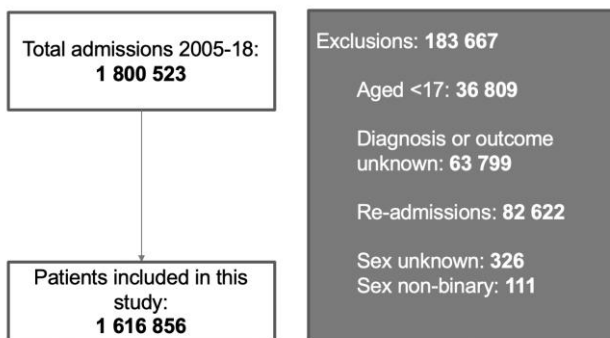


Table 1: Sex balance in ICU admissions by diagnostic category

Diagnostic category		Total Patients (<i>n</i>=1 616 856)	Number of Women (<i>n</i> = 684 434)	% women (99% CI)	Absolute difference <i>n</i> men – <i>n</i> women (<i>n</i>=247 988)	Relative contribution to overall sex difference (%)*
Cardiovascular	Non-op	120 883	49 404	40.9(40.5-41.2)	22 075	8.9
	Op	301 806	82 469	27.3(27.1-27.5)	136 868	55.2
	Total	422 689	131 873	31.2 (31.0-31.4)	158 943	64.1
Trauma	Non-op	53 224	13 249	24.9(24.4-25.5)	26 726	10.8
	Op	25 916	7929	30.6(29.9-31.3)	10 058	4.1
	Total	79 140	21 178	26.8 (26.4-27.2)	36 748	14.8
Respiratory	Non-op	171 155	80 545	47.1(46.7-47.4)	10 065	4.1
	Op	72 705	27 995	38.5(38.0-39.0)	16 715	6.7
	Total	243 860	108 540	44.5 (44.3-44.8)	26 780	10.8
Gastrointestinal	Non-op	54 498	22 576	41.4(40.9-41.9)	9346	3.8
	Op	215 902	100 739	46.7(46.4-46.9)	14 424	5.8
	Total	270 400	123 315	45.6 (45.4-45.9)	23 770	9.6
Sepsis	Total	103 390	46 654	45.1 (44.7-45.5)	10 082	4.1
Neurologic	Non-op	81 241	36 724	45.2(44.8-45.6)	7793	3.1
	Op	11 2271	55 292	49.2(48.9-49.6)	1687	.7
	Total	193 512	92 016	47.6(47.3-47.8)	9480	3.8
Male-Specific	Op	4355	32	0.7 (0.4-1.1)	4291	1.7
Haematologic	Non-op	7182	3258	45.4(43.8-46.9)	666	0.3

	Op	578	292	50.5(45.1-55.9)	-6	0.0
	Total	7760	3550	45.8 (44.3-47.2)	660	0.3
Musculoskeletal, skin & soft tissue	Non-op	3935	1712	43.5(41.5-45.6)	511	0.2
	Op	87 327	43 951	50.3(49.9-50.8)	-575	-0.2
	Total	91 262	45 663	50.0 (49.6-50.5)	-64	0.0
Other	Non-op	9070	4651	51.3 (49.9-52.6)	-232	-0.1
Renal & Genito-urinary	Non-op	20 710	8505	41.1(40.2-42.0)	3700	1.5
	Op	32 330	10 443	32.3(31.6-33.0)	11 444	4.6
	Total	53 040	18 948	35.7(35.3-36.3)	15 144	6.1
Metabolic	Non-op	99 302	53 681	54.1(53.7-54.5)	-8060	-3.3
	Op	12 651	8050	63.6(62.5-64.7)	-3449	-1.4
	Total	111 953	61 731	55.1 (54.8-55.5)	-11 509	-4.6
Female-specific	Non-op	4000	3975	99.4(99.0-99.6)	-3950	-1.6
	Op	22 425	22 308	99.5(99.3-99.6)	-22 191	-8.9
	Total	26 425	26 283	99.5(99.3-99.6)	-26 141	-10.5
Total		1 616 856	684 434	42.3 (42.2-42.4)	247 988	

Non-op = non-operative; op = postoperative. * Relative contribution to overall sex difference = (male admissions within diagnostic category – female admissions within diagnostic category)/(total male admissions – total female admissions)

Table 2: Multivariate logistic model for female ICU admission

Category	Variable	<i>n admissions</i> (% female) (<i>n=1586076</i>)*	Unadjust- ed Odds Ratio	99% CI	Adjusted Odds ratio	99% CI	Wald chi- square
Diagnostic category	Cardiovascular non-operative	120 883 (40.9)	0.68	0.55-0.84	0.69	0.55-0.85	41522 (<i>p</i> <0.001)
	Respiratory non-operative	171 155 (47.1)	0.87	0.7-1.08	0.88	0.71-1.09	
	Gastrointestinal non-operative	54 498 (41.4)	0.69	0.56-.086	0.69	0.56-0.86	
	Neurological non-operative	81 241 (45.2)	0.81	0.65-1.00	0.83	0.67-1.03	
	Sepsis non-operative	103 390 (45.1)	0.81	0.65-1.00	0.82	0.66-1.03	
	Trauma non-operative	53 224 (24.9)	0.32	0.26-0.4	0.33	0.26-0.41	
	Metabolic non-operative	99 302 (54.1)	1.15	0.93-1.43	1.11	0.9-1.38	
	Haematologic non-operative	7182 (45.4)	0.81	0.65-1.02	0.84	0.67-1.05	
	Renal non-operative	20 710 (41.1)	0.68	0.55-0.85	0.69	0.56-0.86	
	Other non-operative	9070 (51.3)	1.03	0.83-1.29	1.01	0.81-1.26	
	Musculoskeletal non-operative	3935 (43.5)	0.75	0.6-0.95	0.75	0.6-0.95	
	Cardiovascular operative	301 806 (27.3)	0.37	0.30-0.46	0.39	0.31-0.48	
	Respiratory operative	72 705 (38.5)	0.61	0.50-0.76	0.62	0.5-0.77	
	Gastrointestinal operative	215 902 (46.7)	0.86	0.69-1.06	0.86	0.69-1.06	
	Neurological operative	112 271 (49.2)	0.95	0.77-1.18	0.96	0.77-1.19	
	Trauma operative	25 916 (30.6)	0.43	0.35-0.54	0.43	0.34-0.53	
	Renal & genito-urinary operative	32 330 (32.3)	0.47	0.37-0.58	0.48	0.38-0.59	
	Musculoskeletal operative	87 327 (50.3)	0.99	0.80-1.23	0.96	0.77-1.19	
	Haematologic operative	578 (50.5)	Reference		Reference		
	Metabolic operative	12 651 (63.6)	1.71	1.38-2.13	1.73	1.39-2.16	
Age	<30 years	107 252 ((45.2)	Reference		Reference		5097 (<i>p</i> <0.001)
	30-39 years	104 065 (46.7)	1.06	1.04-1.09	1.02	1.00-1.04	
	40-49 years	157 172 (44.4)	0.97	0.95-0.99	0.95	0.93-0.97	
	50-59 years	246 354 (40.4)	0.82	0.81-0.84	0.84	0.83-0.86	
	60-69 years	356 780 (37.4)	0.73	0.71-0.74	0.77	0.76-0.78	
	70-79 years	375 028 (39.2)	0.78	0.77-0.8	0.85	0.83-0.86	
	80 years +	239 425 (46.6)	1.06	1.04-1.08	1.08	1.06-1.11	
Hospital	Metropolitan	26 504 (46.3)	Reference		Reference		1294

type	Tertiary	689 648 (37.9)	0.7	0.70-0.72	0.89	0.88-0.90	(p<0.001)
	Rural	210 833 (45.1)	0.95	0.94-0.97	0.97	0.95-0.98	
	Private	424 091 (42.6)	0.86	0.85-0.87	1.03	1.02-.105	
Region	New Zealand	119 895 (39.3)	Reference		Reference		189 (p<0.001)
	Australian Capital Territory	38 876 (42.6)	1.15	1.11-1.18	0.98	0.95-1.01	
	New South Wales	496 064 (42.7)	1.15	1.13-1.17	0.96	0.94-0.98	
	Northern Territory	18 452 (42.8)	1.16	1.11-1.20	0.91	0.87-0.95	
	Queensland	311 095 (40.8)	1.06	1.04-1.08	0.95	0.93-0.97	
	South Australia	113 452 (41.5)	1.10	1.07-1.12	0.97	0.95-0.99	
	Tasmania	26 667 (42.3)	1.13	1.09-1.17	0.97	0.94-1.01	
	Victoria	377 229 (41.5)	1.10	1.08-1.12	0.95	0.93-0.97	
	Western Australia	84 346 (39.2)	1.00	0.97-1.02	0.89	0.87-0.91	
Year	2005	74 073 (40.2)	Reference		Reference		109 (p.0.001)
	2006	78 237 (39.8)	0.99	0.96-1.01	0.98	0.96-1.01	
	2007	81 070 (40.2)	1.00	0.97-1.03	0.98	0.95-1.01	
	2008	82 823 (40.5)	1.01	0.99-1.04	0.99	0.96-1.01	
	2009	91 451 (40.9)	1.03	1.00-1.06	0.99	0.97-1.02	
	2010	100 683 (41.1)	1.04	1.01-1.07	0.99	0.96-1.01	
	2011	108 811 (41.4)	1.05	1.03-1.08	1.00	0.97-1.02	
	2012	117 540 (41.7)	1.06	1.04-1.09	1.01	0.98-1.03	
	2013	121 450 (41.2)	1.04	1.02-1.07	0.99	0.97-1.02	
	2014	131 445 (42.0)	1.08	1.05-1.10	1.02	1.00-1.05	
	2015	142 454 (41.6)	1.06	1.04-1.09	1.00	0.98-1.03	
	2016	151 881 (42.2)	1.09	1.06-1.12	1.02	1.00-1.04	
	2017	155 711 (42.5)	1.10	1.08-1.13	1.03	1.00-1.05	
	2018	148 447 (42.7)	1.11	1.08-1.13	1.03	1.01-1.06	
Elective status	Unplanned	894 017 (43.5)	Reference		Reference		3 (p=0.08)
	Planned	692 059(38.9)	0.83	0.82-0.84	0.99	0.98-1.00	

* Sex-specific diagnoses excluded from this model, as stated in methods (30 780 patients [26315 women]

excluded).

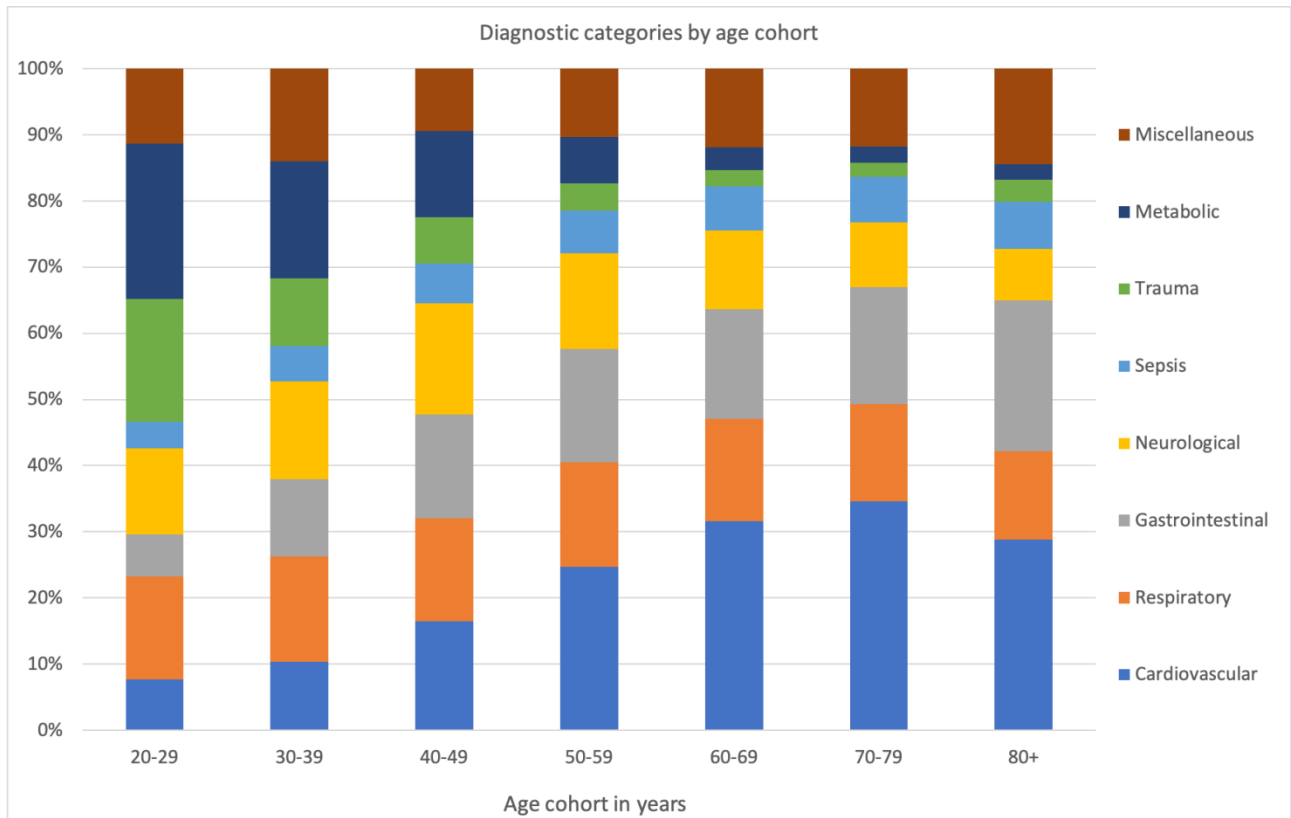
Table 3: Individual diagnoses with the lowest and highest percentage of female admissions*

LOWEST % FEMALE PATIENTS				
Diagnosis	Diagnostic category	Total patients	<i>n</i> women	% women (99% CI)
Endoluminal aortic repair	Cardiovascular operative	7178	1307	18.2 (17.1- 19.4)
Cervical spine injury	Trauma non-operative	1428	261	18.3 (15.7- 21.1)
Ruptured aortic aneurysm	Cardiovascular operative	3101	581	18.7 (17.0- 20.6)
CAGS	Cardiovascular operative	126 146	24 333	19.3 (19.0- 19.6)
Burns	Trauma non-operative	3452	711	20.6 (18.9- 22.4)
Elective AAA repair	Cardiovascular operative	12 617	2669	21.2 (20.2-22.1)
Head +/- multi-trauma	Trauma non-operative	21 957	4933	22.5 (21.7-23.2)
CAGS + valve	Cardiovascular operative	25 657	6404	25.0 (24.3-25.7)
Head +/- multi-trauma	Trauma operative	8290	2086	25.2 (23.9-26.4)
Multi-trauma with spinal injury	Trauma operative	3710	1027	27.7(25.8-29.6)
HIGHEST % FEMALE PATIENTS				
Diagnosis	Diagnostic category	Total patients	<i>n</i> women	% women (99% CI)
Asthma	Respiratory non-operative	12 990	9050	69.7 (68.6-70.7)
Endocrine surgery	Metabolic operative	12 649	8050	63.6 (62.3- 64.7)
Subarachnoid haemorrhage	Neurological operative	7792	4925	63.2 (61.8-64.6)
Subarachnoid haemorrhage	Neurological non-operative	8833	5294	59.9 (58.6-61.3)
Metabolic & endocrine disorders‡	Metabolic non-operative	18 117	10 472	57.8 (56.9-58.8)
Hypertension	Cardiovascular non-operative	2437	1395	57.2 (54.6-59.8)
Gastrointestinal obstruction	Gastrointestinal operative	24 190	13 115	54.2 (53.4-55.0)
Skin surgery	Musculoskeletal operative	9307	5033	54.1 (52.7-55.4)
Drug overdose	Metabolic non-operative	59 084	31 762	53.8 (53.2-54.3)
Gastrointestinal Ischaemia	Gastrointestinal operative	5129	2718	53.0 (51.2-54.8)

*excludes sex specific diagnoses and diagnoses with fewer than 1000 admissions (<0.1% of study population)

‡includes electrolyte abnormalities, thermal and endocrine emergencies

Figure 2: Diagnostic category by age cohort



ANZICS APD Contributing Sites

The authors and the ANZICS CORE management committee would like to thank clinicians, data collectors and researchers from contributing sites listed below:

Albury Wodonga Health ICU, Alfred Hospital ICU, Alice Springs Hospital ICU, Allamanda Private Hospital ICU, Armadale Health Service ICU, Armidale Rural Referral Hospital ICU, Ashford Community Hospital ICU, Auckland City Hospital CV ICU, Auckland City Hospital DCCM, Austin Hospital ICU, Ballarat Health Services ICU, Bankstown-Lidcombe Hospital ICU, Bathurst Base Hospital ICU, Bendigo Health Care Group ICU, Blacktown Hospital ICU, Box Hill Hospital ICU, Brisbane Private Hospital ICU, Brisbane Waters Private Hospital ICU, Buderim Private Hospital ICU, Bunbury Regional Hospital ICU, Bundaberg Base Hospital ICU, Caboolture Hospital ICU, Cabrini Hospital ICU, Cairns Hospital ICU, Calvary Adelaide Hospital ICU, Calvary Hospital (Canberra) ICU, Calvary Hospital (Lenah Valley) ICU, Calvary John James Hospital ICU, Calvary Mater Newcastle ICU, Calvary North Adelaide Hospital ICU, Campbelltown Hospital ICU, Canberra Hospital ICU, Central Gippsland Health Service (Sale) ICU, Christchurch Hospital ICU, Coffs Harbour Health Campus ICU, Concord Hospital (Sydney) ICU, Dandenong Hospital ICU, Dubbo Base Hospital ICU, Dunedin Hospital ICU, Epworth Eastern Private Hospital ICU, Epworth Freemasons Hospital ICU, Epworth Geelong ICU, Epworth Hospital (Richmond) ICU, Fairfield Hospital ICU, Figtree Private Hospital ICU, Fiona Stanley Hospital ICU, Flinders Medical Centre ICU, Flinders Private Hospital ICU, Footscray Hospital ICU, Frankston Hospital ICU, Fremantle Hospital ICU, Gold Coast Private Hospital ICU, Gold Coast University Hospital ICU, Gosford Hospital ICU, Gosford Private Hospital ICU, Goulburn Base Hospital ICU, Goulburn Valley Health ICU, Grafton Base Hospital ICU, Greenslopes Private Hospital ICU, Griffith Base Hospital ICU, Hawkes Bay Hospital ICU, Hervey Bay Hospital ICU, Hollywood Private Hospital ICU, Holmesglen Private Hospital ICU, Hornsby Ku-ring-gai Hospital ICU, Hurstville Private Hospital ICU, Hutt Hospital ICU, Ipswich Hospital ICU, John Fawcner Hospital ICU, John Flynn Private Hospital ICU, John Hunter Hospital ICU, Joondalup Health Campus ICU, Kareena Private Hospital ICU, Knox Private Hospital ICU, Latrobe Regional Hospital ICU, Launceston General Hospital ICU, Lismore Base Hospital ICU, Liverpool Hospital ICU, Logan Hospital ICU, Lyell McEwin Hospital ICU, Mackay Base Hospital ICU, Macquarie University Private Hospital ICU, Manly Hospital & Community Health ICU, Manning Rural Referral Hospital ICU, Maroondah Hospital ICU, Mater Adults Hospital (Brisbane) ICU, Mater Health Services North Queensland ICU, Mater Private Hospital (Brisbane) ICU, Mater Private Hospital (Sydney) ICU, Melbourne Private Hospital ICU, Mersey Community Hospital ICU, Middlemore Hospital ICU, Mildura Base Hospital ICU, Mona Vale Hospital ICU, Monash Medical Centre-Clayton Campus ICU, Mount Hospital ICU, Mount Isa Hospital ICU, Mulgrave Private Hospital ICU, Nambour General Hospital ICU, Nambour Selangor Private Hospital ICU, National Capital Private Hospital ICU, Nelson Hospital ICU, Nepean Hospital ICU, Newcastle Private Hospital ICU, Noosa Hospital ICU, North Shore Hospital ICU, North Shore Private Hospital ICU, North West Regional Hospital (Burnie) ICU, Northeast Health Wangaratta ICU, Norwest Private Hospital ICU, Orange Base Hospital ICU, Peninsula Private Hospital ICU, Peter MacCallum Cancer Institute ICU, Pindara Private Hospital ICU, Port Macquarie Base Hospital ICU, Prince of Wales Hospital (Sydney) ICU, Prince of Wales Private Hospital (Sydney) ICU, Princess Alexandra Hospital ICU, Queen Elizabeth II Jubilee Hospital ICU, Redcliffe Hospital ICU, Repatriation General Hospital (Adelaide) ICU, Robina Hospital ICU, Rockhampton Hospital ICU, Rockingham General Hospital ICU, Rotorua Hospital ICU, Royal Adelaide Hospital ICU, Royal Brisbane and Women's Hospital ICU, Royal Darwin Hospital ICU, Royal Hobart Hospital ICU, Royal Melbourne Hospital ICU, Royal North Shore Hospital ICU, Royal Perth Hospital ICU, Royal Prince Alfred Hospital ICU, Shoalhaven Hospital ICU, Sir Charles Gairdner Hospital ICU, South West Healthcare (Warrnambool) ICU, Southern Cross Hospital (Hamilton) ICU, Southern Cross Hospital (Wellington) ICU, St Andrew's Hospital (Adelaide) ICU, St Andrew's Hospital Toowoomba ICU, St Andrew's War Memorial Hospital ICU, St George Hospital (Sydney) ICU, St George Hospital (Sydney) ICU, St George Hospital (Sydney) ICU2, St George Private Hospital (Sydney) ICU, St Georges Hospital (NZ) ICU, St John Of God Health Care (Subiaco) ICU, St John Of God Hospital (Ballarat) ICU, St John of God Hospital (Bendigo) ICU, St John Of God Hospital (Geelong) ICU, St John Of God Hospital (Murdoch) ICU, St John of God Midland Public & Private ICU, St Vincent's Private Hospital Northside ICU, St Vincent's Hospital (Melbourne) ICU, St Vincent's Hospital (Sydney) ICU, St Vincent's Hospital (Toowoomba) ICU, St Vincent's Private Hospital (Sydney) ICU, St Vincent's Private Hospital Fitzroy ICU, Sunnybank Hospital ICU, Sunshine Hospital ICU, Sutherland Hospital & Community Health Services ICU, Sydney Adventist Hospital ICU, Sydney Southwest Private Hospital ICU, Tamworth Base Hospital ICU, Taranaki Health ICU, Tauranga Hospital ICU, The Bays Hospital ICU, The Chris O'Brien Lifehouse ICU, The Memorial Hospital (Adelaide) ICU, The Northern Hospital ICU, The Prince Charles Hospital ICU, The Queen

Elizabeth (Adelaide) ICU, The Wesley Hospital ICU, Timaru Hospital ICU, Toowoomba Hospital ICU, Townsville University Hospital ICU, Tweed Heads District Hospital ICU, University Hospital Geelong ICU, Wagga Wagga Base Hospital & District Health ICU, Waikato Hospital ICU, Warringal Private Hospital ICU, Wellington Hospital ICU, Werribee Mercy Hospital ICU, Western District Health Service (Hamilton) ICU, Western Hospital (SA) ICU, Western Private Hospital ICU, Westmead Hospital ICU, Westmead Private Hospital ICU, Whangarei Area Hospital, Northland Health Ltd ICU, Wimmera Health Care Group (Horsham) ICU, Wollongong Hospital ICU, Wollongong Private Hospital ICU, Wyong Hospital ICU