

Supplementary materials

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Table S1 Codes for cardiovascular disease subtypes and procedures included in the study

Cardiovascular subtypes	ICD-10 codes
Acute coronary syndrome	I20.0, I21, I22, I24
Heart failure	I50
Acute stroke/ Transient Ischaemic Attack	I60, I61, I63, I64, G45
Aortic Aneurysm	I71
Peripheral arterial disease	I70, I73, I74, I77
Venous thromboembolism	I26, I80, I81, I82
Cardiovascular Procedures	OPSC-4 codes, ICD-10 codes
Percutaneous coronary intervention	K49; K50, K63.1-K63.6; K65; K75
Coronary artery bypass grafts	K40; K41; K42; K43; K44; K45; K46
Pacemaker or cardiac resynchronisation therapy	K59, K60; K61
Ventricular assist device or heart transplant	K01, K02; K54.1; K54.2
Stroke thrombolysis or thrombectomy	I63 AND X83.3, I63 AND L35.4
Carotid endarterectomy or stenting	L29.4; L29.5; L31.4
Cerebral aneurysm coiling	O01 or O02 or O03 or O04 AND Y53 AND Z35
Aortic aneurysm repair	L18; L19; L20; L21; L22; L23; L25; L26; L27; L28
Peripheral limb angioplasty	L54; L63; L66; L71.1
Limb revascularisation, bypass or amputation	L16; L20.6; L21.6; L48; L49; L50; L51; L52; L53; L56; L57; L58; L59; L60; L65.2; L65.3; X09; X10; X11, X12
Pulmonary artery embolectomy or embolisation	L12.4; L12.5; L13

ICD-10: international classification of diseases, 10th revision; OPSC-4: Office of population censuses and surveys classification of interventions and procedures, version 4

Table S2 – Demographic characteristics for individuals admitted for cardiovascular disease diagnoses

Characteristics n (%)	England		Scotland		Wales	
	2016-2019	2020-2021	2016-2019	2020-2021	2016-2019	2020-2021
Cardiac						
<i>Acute coronary syndrome</i>						
Men	276824 (65.2)	133482 (66.0)	6576 (63.0)	6529 (64.4)	4339 (63.3)	4228 (65.0)
Age (years)						
<50	36555 (8.6)	17541 (8.7)	825 (7.9)	736 (7.3)	488 (7.1)	469 (7.2)
50-59	75724 (17.8)	38030 (18.8)	1974 (18.9)	1959 (19.3)	1174 (17.1)	1164 (17.9)
60-69	94958 (22.4)	47268 (23.4)	2492 (23.9)	2509 (24.8)	1588 (23.1)	1555 (23.9)
70-79	105203 (24.8)	50809 (25.1)	2522 (24.1)	2571 (25.4)	1797 (26.2)	1799 (27.7)
≥ 80	112427 (26.5)	48573 (24.0)	2634 (25.2)	2358 (23.3)	1810 (26.4)	1514 (23.3)
Ethnicity						
White	335062 (78.9)	155336 (76.8)	8452 (80.9)	8112 (80.1)	2175 (31.8)	2338 (36.0)
Mixed race	1728 (0.4)	933 (0.5)	14 (0.1)	20 (0.1)	<5	8 (0.1)
Asian	30599 (7.2)	14360 (7.1)	142 (1.4)	137 (1.4)	16 (0.2)	19 (0.3)
Black	5819 (1.4)	2795 (1.4)	11 (0.1)	10.5 (0.1)	<5	<5
Other or unknown	51659 (12.2)	28797 (14.2)	1830 (17.5)	1855 (18.3)	4655 (68.0)	4125 (63.6)
Charlson index						
0	158321 (37.3)	70883 (35.1)	6176 (59.1)	6002 (59.24)	532 (7.8)	482 (7.4)
1	128510 (30.2)	59312 (29.3)	2462 (23.6)	2540 (25.1)	2811 (41.0)	2520 (38.8)
2	65846 (15.5)	32731 (16.2)	1062 (10.2)	942 (9.3)	1815 (26.5)	1818 (28.0)
3+	72190 (17.0)	39295 (19.4)	748 (7.2)	649 (6.4)	1699 (24.8)	1682 (25.9)
<i>Heart failure</i>						
Men					2648	2473
	200885 (54.4)	102542 (54.4)	3527 (52.9)	3402 (52.5)	(53.77)	(53.86)
Age (years)						
<50	11093 (3.0)	5648 (3.0)	199 (3.0)	214 (3.3)	130 (2.64)	122 (2.65)
50-59	20883 (5.7)	11500 (6.1)	405 (6.1)	444 (6.9)	248 (5.03)	248 (5.41)
60-69	45635 (12.4)	22697 (12.0)	951 (14.3)	953 (14.7)	595 (12.09)	544 (11.85)
70-79	96306 (26.1)	49275 (26.1)	1861 (27.9)	1762 (27.2)	1364 (27.7)	1282 (27.9)
≥ 80	195281 (52.9)	99508 (52.8)	3254 (48.8)	3102 (47.9)	2588 (52.6)	2395 (52.2)
Ethnicity						
White	309677 (83.9)	156050 (82.7)	5870 (88.0)	5678 (87.7)	1800 (36.6)	2072 (45.2)
Mixed race	1418 (0.4)	769 (0.4)	11 (0.2)	10 (0.2)	<5	<5
Asian	21250 (5.8)	9877 (5.2)	79 (1.2)	91 (1.4)	12 (0.25)	20 (0.44)
Black	10035 (2.7)	5036 (2.7)	8 (0.1)	13 (0.2)	<5	<5
Other or unknown	26818 (7.3)	16896 (9.0)	703 (10.5)	683 (10.6)	3103 (63.1)	2487 (54.3)
Charlson index						
0	74096 (20.1)	34706 (18.4)	2508 (37.6)	2441 (37.7)	<5	<5
1	82554 (22.4)	39697 (21.0)	1671 (25.1)	1725 (26.6)	1127 (22.9)	1056 (23.0)
2	76921 (20.8)	38727 (20.5)	1307 (19.6)	1263 (19.5)	1264 (25.7)	1206 (26.3)
3+	135627 (36.7)	75498 (40.0)	1184 (17.8)	1046 (16.2)	2533 (51.4)	2330 (50.8)
Cerebrovascular						
<i>Acute stroke or transient ischaemic attack</i>						
Men	226362 (50.5)	116466 (51.7)	6194 (49.7)	6283 (51.1)	3740 (50.1)	3644 (51.2)
Age (years)						
<50	31172 (6.9)	16012 (7.1)	761 (6.1)	689 (5.6)	449 (6.0)	426 (6.0)
50-59	47446 (10.6)	25746 (11.4)	1480 (11.9)	1455 (11.8)	789 (10.6)	715 (10.0)
60-69	73660 (16.4)	38182 (16.9)	2390 (19.2)	2384 (19.4)	1278 (17.1)	1209 (17.0)
70-79	118130 (26.3)	60486 (26.8)	3410 (27.3)	3528 (28.7)	2067 (27.7)	2118 (29.8)
≥ 80	178156 (39.7)	84947 (37.7)	4431 (35.5)	4253 (34.6)	2885 (38.6)	2652 (37.3)
Ethnicity						
White	366735 (81.8)	177503 (78.8)	10112 (81.1)	10171 (82.6)	2104 (28.2)	2415 (34.0)
Mixed race	1601 (0.4)	1014 (0.4)	11 (0.08)	14 (0.1)	<5	<5
Asian	16382 (3.7)	8847 (3.9)	101 (0.8)	98 (0.8)	12 (0.2)	14 (0.2)
Black	9152 (2.0)	4760 (2.1)	13 (0.1)	17 (0.1)	<5	6 (0.1)
Other or unknown	54694 (12.2)	33249 (14.8)	2235 (17.9)	2008 (16.3)	5342 (71.6)	4674 (65.8)
Charlson index						
0	169443 (37.8)	75659 (33.6)	7077 (56.7)	6840 (55.6)	2902 (38.9)	2793 (39.2)
1	110395 (24.6)	49825 (22.1)	2805 (22.5)	2724 (22.1)	1831 (24.5)	1808 (25.4)
2	80267 (17.9)	43724 (19.4)	1527 (12.3)	1643 (13.4)	1364 (18.3)	1257 (17.7)
3+	88459 (19.7)	56165 (24.9)	1063 (8.5)	1101 (9.0)	1370 (18.4)	1260 (17.7)

Other Vascular Aortic Aneurysm							
Men		36433 (76.1)	14238 (75.1)	692.(75.9)	547.5 (72.5)	515 (76.5)	377 (72.9)
Age (years)							
	<50	2445 (5.1)	1090 (5.7)	33.3 (3.7)	34 (4.5)	25 (3.7)	30 (5.7)
	50-59	2918 (6.1)	1496 (7.9)	50.3 (5.5)	43 (5.7)	40 (5.9)	38 (7.5)
	60-69	9604 (20.1)	3669 (19.3)	209 (22.9)	168 (22.2)	134 (19.9)	103 (19.9)
	70-79	18567 (38.8)	7228 (38.1)	352 (38.6)	302 (39.9)	269 (39.9)	198 (38.3)
	≥ 80	14365 (30.0)	5482 (28.9)	268 (29.4)	209 (27.7)	206 (30.5)	148 (28.6)
Ethnicity							
	White	37482 (78.3)	14168 (74.7)	735 (80.6)	604 (79.9)	262 (39.2)	213 (41.5)
	Mixed race	149 (0.3)	82 (0.4)	<5	<5	<5	<5
	Asian	629 (1.3)	298 (1.6)	<5	<5	<5	<5
	Black	593 (1.2)	253 (1.3)	<5	<5	<5	<5
	Other or unknown	9046 (18.9)	4164 (22.0)	174 (19.1)	147 (19.4)	407 (60.8)	300 (58.5)
Charlson index							
	0	19712 (41.2)	7284 (38.4)	630 (69.0)	481 (63.7)	286 (42.5)	206 (39.9)
	1	14227 (29.7)	5468 (28.8)	149 (16.3)	151 (20.0)	186 (27.7)	165 (31.9)
	2	7711 (16.1)	3216 (17.0)	84 (9.2)	74 (9.7)	98 (14.6)	78 (15.0)
	3+	6249 (13.0)	2997 (15.8)	50 (5.4)	50 (6.6)	103 (15.3)	68 (13.3)
Peripheral arterial disease							
Men		101842 (58.6)	42216 (58.7)	2185 (59.0)	1829 (58.9)	1354 (60.3)	1169 (63.0)
Age (years)							
	<50	19836 (11.4)	8350 (11.6)	295 (8.0)	248 (8.0)	188 (8.4)	128 (6.9)
	50-59	26569 (15.3)	10866 (15.1)	603 (16.3)	472 (15.2)	331 (14.7)	264 (14.3)
	60-69	43279 (24.9)	17609 (24.5)	961 (25.9)	829 (26.7)	574 (25.6)	490 (26.4)
	70-79	48592 (27.9)	20219 (28.1)	1090 (29.4)	906 (29.2)	656 (29.2)	538 (29.0)
	≥ 80	35628 (20.5)	14814 (20.6)	756 (20.4)	651 (21.0)	497 (22.1)	435 (23.4)
Ethnicity							
	White	142160 (81.7)	56427 (78.5)	3216 (86.8)	2632 (84.8)	806 (36.0)	793 (43.0)
	Mixed race	718 (0.4)	359 (0.5)	<5	<5	<5	<5
	Asian	5660 (3.3)	2515 (3.5)	24 (0.7)	22 (0.7)	<5	<5
	Black	2912 (1.7)	1171 (1.6)	<5	<5	<5	<5
	Other or unknown	22454 (12.9)	11386 (15.8)	456 (12.3)	445 (14.3)	1434 (64.0)	1052 (57.0)
Charlson index							
	0	67397 (38.8)	24370 (33.9)	2355 (63.6)	1785 (57.5)	862 (38.4)	584 (31.5)
	1	47357 (27.2)	19098 (26.6)	626 (16.9)	644 (20.7)	624 (27.8)	542 (29.2)
	2	29125 (16.7)	12946 (18.0)	445 (12.0)	414 (13.3)	358 (16.0)	352 (18.9)
	3+	30025 (17.3)	15444 (21.5)	280 (7.6)	262 (8.4)	402 (17.9)	378 (20.4)
Venous thromboembolism							
Men		121772 (48.8)	69032 (49.9)	2521 (49.5)	2653 (49.3)	1609 (48.4)	1864 (49.2)
Age (years)							
	<50	57825 (23.2)	31500 (22.8)	1220 (24.0)	1148 (21.3)	662 (19.9)	768 (20.3)
	50-59	38076 (15.3)	22682 (16.4)	774 (15.2)	898 (16.7)	496 (14.9)	600 (15.8)
	60-69	47365 (19.0)	26159 (18.9)	10255 (20.1)	1077 (20.0)	684 (20.6)	742 (19.6)
	70-79	55994 (22.4)	31391 (22.7)	1146 (22.5)	1297 (24.1)	808 (24.3)	940 (24.8)
	≥ 80	50253 (20.1)	26536 (19.2)	926 (18.2)	966 (17.9)	676 (20.3)	739 (19.5)
Ethnicity							
	White	210082 (84.2)	112375 (81.3)	4177 (82.1)	4487 (83.3)	973 (29.3)	1416 (37.5)
	Mixed race	1393 (0.6)	884 (0.6)	6 (0.1)	9 (0.2)	<5	<5
	Asian	6154 (2.5)	3481 (2.5)	26 (0.5)	19 (0.4)	<5	6 (0.1)
	Black	6067 (2.4)	3662 (2.6)	7 (0.1)	12 (0.2)	<5	<5
	Other or unknown	25817 (10.3)	17866 (12.9)	876 (17.2)	857 (15.9)	2344 (70.7)	2356 (62.4)
Charlson index							
	0	118865 (47.6)	64012 (46.3)	2969 (58.3)	3051 (56.7)	1564 (47.0)	1740 (45.9)
	1	65512 (26.3)	34998 (25.3)	870 (17.1)	1013 (18.8)	744 (22.4)	856 (22.6)
	2	35776 (14.3)	20513 (14.8)	573 (11.3)	609 (11.3)	423 (12.7)	480 (12.7)
	3+	29360 (11.8)	18745 (13.6)	680 (13.4)	712 (13.2)	596 (17.9)	712 (18.8)

Venous thromboembolism: deep vein thrombosis or pulmonary embolism

Table S3 – Demographic characteristics for individuals admitted for cardiovascular disease procedures

Characteristics n (%)	England		Scotland		Wales	
	2016-2019	2020-2021	2016-2019	2020-2021	2016/19	2020/21
Cardiac						
<i>Percutaneous coronary intervention</i>						
Men	526548 (66.8)	202595 (68.3)	12408 (66.5)	10886 (68.0)	7319 (65.6)	6152 (67.4)
Age (years)						
<50	76091 (9.7)	28441 (9.6)	1810 (9.7)	1413 (8.8)	991 (8.9)	791 (8.7)
50-59	161097 (20.5)	61847 (20.9)	4266 (22.9)	3691 (23.1)	2191 (19.7)	1772 (19.4)
60-69	222606 (28.3)	83024 (28.0)	5673 (30.4)	4835 (30.2)	3219 (28.9)	2546 (27.9)
70-79	226845 (28.8)	86264 (29.1)	4951 (26.6)	4396 (27.5)	3344 (30.0)	2800 (30.7)
≥ 80	101079 (12.8)	36996 (12.5)	1950 (10.5)	1676 (10.5)	1406 (12.6)	1219 (13.4)
Ethnicity						
White	597885 (75.9)	218505 (73.7)	12990 (69.7)	10202 (63.7)	3455 (31.0)	3035 (33.3)
Mixed race	3849 (0.5)	1555 (0.5)	13 (0.1)	15 (0.1)	6 (0.1)	6 (0.1)
Asian	55527 (7.0)	20461 (6.9)	223 (1.2)	175 (1.1)	30 (0.3)	32 (0.4)
Black	11134 (1.4)	4304 (1.5)	19 (0.1)	17 (0.1)	9 (0.1)	<5
Other or unknown	119323 (15.1)	51747 (17.4)	5405 (29.0)	5602 (35.0)	7651 (68.6)	6045 (66.3)
Charlson index						
0	380128 (48.3)	130839 (44.1)	12622 (67.7)	10751 (67.2)	11054 (99.2)	9060 (99.3)
1	246982 (31.4)	93287 (31.5)	4223 (22.6)	3715 (23.2)	96 (0.9)	68 (0.8)
2	94263 (12.0)	40305 (13.6)	1207 (6.5)	1042 (6.5)	<5	<5
3+	66345 (8.4)	32141 (10.8)	597 (3.2)	503 (3.1)	<5	<5
<i>Coronary artery bypass grafts</i>						
Men	50706 (81.5)	17493 (82.7)	1054 (80.5)	837 (80.71)	810 (79.4)	537 (82.9)
Age (years)						
<50	2865 (4.6)	1074 (5.1)	52 (4.0)	35 (3.4)	33 (3.2)	21 (3.2)
50-59	10736 (17.3)	3982 (18.8)	241 (18.4)	177 (17.0)	143 (14.0)	108 (16.8)
60-69	20045 (32.2)	7056 (33.4)	467 (35.7)	388 (37.4)	320 (31.4)	220 (34.1)
70-79	22765 (36.6)	7653 (36.2)	450 (34.3)	387 (37.3)	400 (39.2)	254 (39.2)
≥ 80	5793 (9.3)	1377 (6.5)	100 (7.6)	52 (5.0)	124 (12.1)	44 (6.7)
Ethnicity						
White	44977 (72.3)	14089 (66.6)	833 (63.6)	528 (50.9)	415 (41.0)	268 (41.6)
Mixed race	238 (0.4)	100 (0.5)	<5	<5	<5	<5
Asian	4519 (7.3)	1437 (6.8)	15 (1.1)	10 (0.9)	<5	<5
Black	463 (0.7)	157 (0.7)	<5	<5	<5	<5
Other or unknown	12007 (19.3)	5359 (25.3)	460 (35.2)	499 (48.1)	597 (59.0)	375 (58.4)
Charlson index						
0	22626 (36.4)	6301 (29.8)	781 (59.7)	596 (57.5)	711 (69.9)	471 (72.9)
1	21093 (33.9)	6878 (32.5)	372 (28.4)	313 (30.2)	306 (30.1)	175 (27.1)
2	10438 (16.8)	4335 (20.5)	106 (8.1)	91 (8.8)	<5	<5
3+	8047 (12.9)	3628 (17.2)	50 (3.8)	37 (3.6)	<5	<5
<i>Pacemaker or cardiac resynchronisation therapy</i>						
Men	207933 (67.0)	88009 (67.6)	2615 (63.8)	2605 (64.4)	3036 (65.3)	2706 (66.7)
Age (years)						
<50	22408 (7.2)	8548 (6.6)	274 (6.7)	239.5 (5.9)	334 (7.2)	294 (7.2)
50-59	29577 (9.5)	12411 (9.5)	354 (8.6)	341 (8.4)	409 (8.8)	366 (9.0)
60-69	59158 (19.1)	23955 (18.4)	702 (17.1)	713.5 (17.6)	882 (19.0)	747 (18.4)
70-79	102244 (33.0)	43064 (33.1)	1320 (32.2)	1274 (31.5)	1585 (34.1)	1346 (33.2)
≥ 80	96791 (31.2)	42160 (32.4)	1446 (35.3)	1478 (36.5)	1441 (31.0)	1307 (32.2)
Ethnicity						
White	251103 (81.0)	102071 (78.4)	3231 (78.9)	3252 (80.4)	1712 (37.0)	1434 (35.4)
Mixed race	1151 (0.4)	543 (0.4)	<5	<5	<5	<5
Asian	12396 (4.0)	5042 (3.9)	28 (0.7)	28 (0.7)	11 (0.2)	8 (0.2)
Black	3874 (1.2)	1695 (1.3)	<5	<5	<5	<5
Other or unknown	41654 (13.4)	20787 (16.0)	831 (20.29)	761 (18.8)	2920 (62.9)	2609 (64.4)
Charlson index						
0	128245 (41.3)	50041 (38.5)	2749 (67.1)	2715 (67.1)	3717 (80.0)	3358 (82.8)
1	90461 (29.2)	36263 (27.9)	760 (18.6)	751 (18.6)	920 (19.8)	694 (17.1)
2	48521 (15.6)	21771 (16.7)	365 (8.9)	382 (9.4)	10 (0.2)	6 (0.2)
3+	42951 (13.8)	22063 (17.0)	222 (5.4)	199 (4.9)	<5	<5
<i>Ventricular assist device or heart transplant</i>						
Men	750 (70.4)	202 (66.9)	12 (75.8)	14 (56.3)	7 (100)	6 (100)

Age (years)						
	<50	528 (49.6)	162 (53.6)	9 (56.5)	11 (45.8)	6 (100)
	50-59	313 (29.4)	92 (30.5)	6 (35.5)	9 (37.5)	0
	60-69	199 (18.7)	45 (14.9)	<5	<5	0
	70-79	NR	NR	<5	<5	0
	≥ 80	NR	NR	<5	<5	0
Ethnicity						
	White	778 (73.1)	228 (75.5)	6 (38.7)	13 (52.1)	8 (100)
	Mixed race	NR	NR	NR		0
	Asian	95 (8.9)	23 (7.6)	<5	<5	0
	Black	38 (3.6)	6 (2.0)	NR		0
	Other or unknown	134 (12.6)	41 (13.6)	9 (59.7)	12 (47.9)	0
Charlson index						
	0	362 (34.0)	124 (41.1)	9 (59.7)	17 (70.8)	11 (100)
	1	306 (28.7)	80 (26.5)	<5	6 (22.9)	0
	2	179 (16.8)	46 (15.2)	<5	<5	0
	3+	218 (20.5)	52 (17.2)	<5	<5	0
Cerebrovascular						
<i>Stroke thrombolysis or thrombectomy</i>						
Men		8592 (55.6)	4978 (57.3)	<5	<5	139 (57.4)
Age (years)						
	<50	1121 (7.3)	711 (8.2)	<5	<5	15 (6.2)
	50-59	1912 (12.4)	1220 (14.1)	<5	<5	28 (11.3)
	60-69	2914 (18.9)	1714 (19.7)	<5	<5	48 (19.6)
	70-79	4515 (29.2)	2578 (29.7)	<5	<5	73 (30.2)
	≥ 80	4990 (32.3)	2460 (28.3)	<5	<5	79 (32.7)
Ethnicity						
	White	12281 (79.5)	6384 (73.5)	<5	<5	84 (34.8)
	Mixed race	52 (0.3)	40 (0.5)	<5	<5	<5
	Asian	508 (3.3)	320 (3.7)	<5	<5	<5
	Black	216 (1.4)	122 (1.4)	<5	<5	<5
	Other or unknown	2395 (15.5)	1817 (20.9)	<5	<5	158 (65.2)
Charlson index						
	0	5984 (38.7)	2672 (30.8)	<5	<5	245 (100)
	1	3374 (21.8)	1540 (17.7)	<5	<5	0
	2	3181 (20.6)	2259 (26.0)	<5	<5	0
	3+	2913 (18.9)	2212 (25.5)	<5	<5	0
<i>Carotid endarterectomy or stenting</i>						
Men		9366 (67.5)	3839 (68.8)	274 (68.7)	209 (68.2)	149 (65.8)
Age (years)						
	<50	281 (2.0)	144 (2.6)	7 (1.8)	7 (2.3)	<5
	50-59	1520 (11.0)	653 (11.7)	58 (14.6)	48 (15.5)	30 (13.4)
	60-69	3575 (25.8)	1550 (27.8)	128 (32.0)	88 (28.6)	68 (30.4)
	70-79	5530 (39.9)	2149 (38.5)	143 (35.8)	117 (38.2)	88 (39.8)
	≥ 80	2965 (21.4)	1081 (19.4)	63 (15.9)	48 (15.5)	36 (16.4)
Ethnicity						
	White	10469 (75.5)	3958 (71.0)	300 (75.3)	224 (72.9)	87 (38.5)
	Mixed race	26 (0.2)	8 (0.1)	<5	<5	
	Asian	342 (2.5)	133 (2.4)	<5	<5	
	Black	43 (0.3)	23 (0.4)	<5	<5	
	Other or unknown	2991 (21.6)	1455 (26.1)	96 (24.1)	82 (26.6)	139 (61.5)
Charlson index						
	0	5961 (43.0)	2279 (40.9)	270 (67.8)	202 (65.9)	225 (100)
	1	4073 (29.4)	1534 (27.5)	76 (19.06)	64 (20.7)	0
	2	2168 (15.6)	952 (17.1)	33 (8.2)	31 (10.0)	0
	3+	1669 (12.0)	812 (14.6)	20 (5.1)	11 (3.4)	0
<i>Cerebral aneurysm coiling</i>						
Men		1921 (30.4)	1007 (31.1)	68 (27.3)	79 (29.6)	44 (30.5)
Age (years)						
	<50	1741 (27.6)	774 (23.9)	71 (28.7)	63 (23.5)	40 (28.3)
	50-59	1916 (30.4)	1003 (31.0)	84 (34.0)	81 (30.5)	51 (36.3)
	60-69	1597 (25.3)	845 (26.1)	58 (23.4)	76 (28.6)	34 (23.8)
	70-79	880 (13.9)	512 (15.8)	29 (11.5)	38 (14.1)	16 (11.6)

	≥ 80	179 (2.8)	100 (3.1)	6 (2.4)	9 (3.2)	<5	<5
Ethnicity							
	White	4553 (72.1)	2204 (68.2)	149 (60.3)	167 (62.7)	47 (33.2)	28 (22.3)
	Mixed race	37 (0.6)	28 (0.9)	<5	<5	<5	<5
	Asian	190 (3.0)	124 (3.8)	<5	<5	<5	<5
	Black	174 (2.8)	87 (2.7)	<5	<5	<5	<5
	Other or unknown	1359 (21.5)	791 (24.5)	94 (38.1)	97 (36.53)	94 (66.8)	98 (77.7)
Charlson index							
	0	4125 (65.3)	1971 (60.9)	218 (88.0)	234 (88.0)	142 (100)	126 (100)
	1	1352 (21.4)	745 (23.0)	22 (8.7)	22 (8.1)	0	0
	2	586 (9.3)	340 (10.5)	7 (2.9)	9 (3.2)	0	0
	3+	250 (4.0)	178 (5.5)	<5	<5	0	0
Other vascular							
Aortic aneurysm repair							
	Men	36084 (73.3)	12305 (74.9)	1046 (71.7)	786 (72.2)	558 (72.8)	388 (74.9)
Age (years)							
	<50	5244 (10.6)	1975 (12.0)	126 (8.6)	105 (9.7)	73 (9.5)	58 (11.2)
	50-59	4194 (8.5)	1654 (10.1)	144 (9.8)	113 (10.4)	62 (8.1)	50 (9.7)
	60-69	10564 (21.4)	3480 (21.2)	374 (25.7)	282 (25.9)	164 (21.4)	108 (20.7)
	70-79	18233 (37.0)	6114 (37.2)	550 (37.7)	424 (39.0)	285 (37.2)	199 (38.3)
	≥ 80	11017 (22.4)	3215 (19.6)	266 (18.2)	164 (15.1)	182 (23.8)	104 (20.0)
Ethnicity							
	White	38115 (77.4)	11988 (72.9)	994 (68.1)	698 (64.1)	315 (41.6)	222 (43.2)
	Mixed race	206 (0.4)	78 (0.5)	<5	<5	<5	<5
	Asian	1339 (2.7)	445 (2.7)	8 (0.5)	8 (0.7)	<5	<5
	Black	553 (1.1)	181 (1.1)	<5	<5	<5	<5
	Other or unknown	9039 (18.4)	3746 (22.8)	457 (31.3)	379 (34.8)	443 (58.5)	293 (56.8)
Charlson index							
	0	21802 (44.3)	6696 (40.7)	1024 (70.2)	749 (68.8)	670 (87.6)	386 (74.4)
	1	14712 (29.9)	4849 (29.5)	283 (19.4)	211 (19.4)	95 (12.4)	133 (25.7)
	2	7263 (14.7)	2636 (16.0)	104 (7.1)	93 (8.5)	<5	<5
	3+	5475 (11.1)	2257 (13.7)	48 (3.3)	37 (3.4)	<5	<5
Peripheral limb angioplasty							
	Men	61640 (67.5)	24672 (68.4)	1272 (63.8)	1097 (63.9)	663 (64.5)	489 (67.2)
Age (years)							
	<50	3792 (4.2)	1392 (3.9)	103 (5.2)	83 (4.8)	41 (4.0)	28 (3.9)
	50-59	12277 (13.4)	4668 (12.9)	307 (15.4)	246 (14.3)	137 (13.3)	82 (11.2)
	60-69	24685 (27.0)	9642 (26.7)	547 (27.42)	468 (27.2)	275 (26.8)	196 (27.0)
	70-79	29822 (32.7)	11988 (33.2)	628 (31.5)	553 (32.2)	332 (32.3)	242 (33.2)
	≥ 80	20720 (22.7)	8390 (23.3)	410 (20.5)	369 (21.5)	242 (23.6)	180 (24.7)
Ethnicity							
	White	74565 (81.7)	28354 (78.6)	1690 (84.7)	1379 (80.2)	414 (40.4)	317 (43.9)
	Mixed race	281 (0.3)	126 (0.3)	<5	<5	<5	<5
	Asian	1906 (2.1)	767 (2.1)	10 (0.5)	14 (0.8)	<5	<5
	Black	1303 (1.4)	588 (1.6)	<5	<5	<5	<5
	Other or unknown	13241 (14.5)	6245 (17.3)	289 (14.5)	323 (18.8)	610 (59.6)	404 (56.1)
Charlson index							
	0	30942 (33.9)	9703 (26.9)	1277 (64.0)	921 (53.6)	1014 (98.7)	702 (97.3)
	1	25033 (27.4)	9345 (25.9)	302 (15.1)	348 (20.3)	13 (1.3)	20 (2.8)
	2	16904 (18.5)	7362 (20.4)	281 (14.1)	314 (18.3)		
	3+	18417 (20.2)	9670 (26.8)	136 (6.8)	136 (7.9)		
Limb revascularisation, bypass or amputation							
	Men	48386 (70.8)	20393 (73.5)	1877 (69.0)	1731 (70.7)	1048 (70.8)	945 (75.2)
Age (years)							
	<50	8938 (13.1)	3427 (12.4)	304 (11.2)	248 (10.1)	168 (11.4)	123 (9.8)
	50-59	12231 (17.9)	5141 (18.5)	521 (19.2)	453 (18.5)	251 (16.9)	214 (17.1)
	60-69	17374 (25.4)	7336 (26.5)	758 (27.9)	720 (29.4)	396 (26.7)	377 (30.0)
	70-79	18587 (27.2)	7605 (27.4)	772 (28.4)	698 (28.5)	422 (28.5)	344 (27.4)
	≥ 80	11202 (16.4)	4226 (15.2)	365 (13.4)	328 (13.4)	244 (16.5)	198 (15.7)
Ethnicity							
	White	56527 (82.7)	21977 (79.2)	2331 (85.7)	2008 (82.1)	597 (40.5)	572 (45.8)
	Mixed race	229 (0.3)	139 (0.5)	<5	<5	<5	<5
	Asian	1293 (1.9)	575 (2.1)	19 (0.7)	17 (0.7)	<5	<5

Black	912 (1.3)	383 (1.4)	<5	<5	<5	<5
Other or unknown	9371 (13.7)	4661 (16.8)	366 (13.4)	417 (17.0)	879 (59.5)	678 (54.2)
Charlson index						
0	19657 (28.8)	6691 (24.1)	1522 (56.0)	1198 (49)	1472 (99.4)	1248 (100)
1	16691 (24.4)	6030 (21.7)	422 (15.5)	465 (19.0)	10 (0.6)	0
2	15848 (23.2)	7097 (25.6)	551 (20.3)	567 (23.2)	0	0
3+	16136 (23.6)	7917 (28.5)	224 (8.2)	217 (8.9)	0	0
<i>Pulmonary artery embolectomy or embolisation</i>						
Men	1938 (52.0)	774 (52.6)	58 (46.7)	39 (50.7)	27 (49.54)	18 (61.4)
Age (years)						
<50	2512 (67.4)	958 (65.1)	57 (45.7)	36 (46.1)	36 (85.8)	15 (100)
50-59	329 (8.8)	125 (8.5)	16 (13.1)	15 (19.5)	<5	<5
60-69	375 (10.1)	170 (11.5)	23 (18.7)	12 (14.9)	6 (14.2)	<5
70-79	383 (10.3)	159 (10.8)	20 (15.7)	11 (13.6)	<5	<5
≥ 80	127 (3.4)	60 (4.1)	9 (6.8)	<5	<5	<5
Ethnicity						
White	2577 (69.2)	1049 (71.3)	86 (69.4)	47 (61.0)	35 (69.2)	13 (44.1)
Mixed race	69 (1.9)	25 (1.7)	<5	<5	<5	<5
Asian	301 (8.1)	137 (9.3)	<5	<5	<5	<5
Black	112 (3.0)	28 (1.9)	<5	<5	<5	<5
Other or unknown	667 (17.9)	233 (15.8)	37 (29.8)	29 (37.0)	16 (30.9)	16 (55.9)
Charlson index						
0	1809 (48.6)	700 (47.6)	77 (62.0)	57 (73.4)	53 (100)	30 (100)
1	1327 (35.6)	567 (38.5)	24 (19.1)	11 (14.3)	0	0
2	338 (9.1)	122 (8.3)	14 (11.5)	<5	0	0
3+	252 (6.8)	83 (5.6)	9 (7.4)	<5	0	0

Figure S1: Study data sources and datasets



TRE: trusted research environment

Figure S2: Monthly emergency hospital procedures for cardiovascular disease across subtypes, across three countries in the UK and across pre-pandemic (2016-2019) and pandemic (2020-2021) periods.

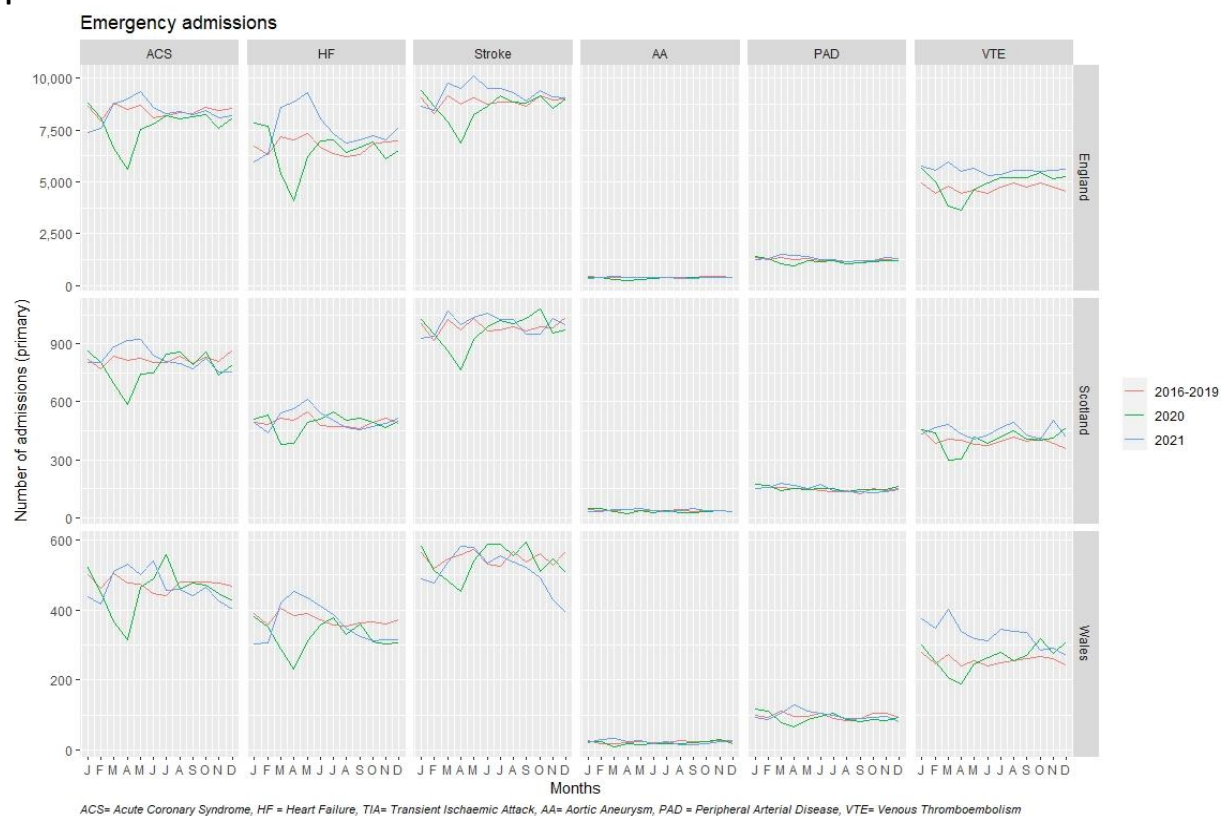


Figure S3: Monthly elective procedures for cardiovascular disease across subtypes, across three countries in the UK and across pre-pandemic (2016-2019) and pandemic (2020-2021) periods.

