

Table 1 Analysis of prevalent and incident cases for different healthcare service parameters and medication types. Values are numbers (%) in and % in b

a. Overall prevalence and incidence rates based on medical and pharmacy claims

	Healthcare Service Variable	Overall	Male	Female
Prevalence	Medical and Pharmacy Claims	186268 (2.23)	103495 (2.53)	82773 (1.94)
Incidence	Medical and Pharmacy Claims	27453 (3.29)	14766 (3.61)	12687 (2.98)

b. Prevalence and incidence targets by gender and age groups

		≥ 65 years			< 65 years		
	Healthcare Service Variable	Overall	Male	Female	Overall	Male	Female
Prevalence	Anticoagulant	59690 (6.53)	28582 (7.33)	31108 (5.93)	37327 (0.50)	23826 (0.64)	13501 (0.36)
	Rhythm control	13482 (1.47)	6509 (1.67)	6973 (1.33)	10631 (0.14)	7419 (0.20)	3212 (0.09)
	Emergency room visit (ER)	24859 (2.72)	11289 (2.89)	13570 (2.59)	884 (0.01)	548 (0.01)	336 (0.01)
	Hospital admission (HA)	7927 (0.87)	3309 (0.85)	4618 (0.88)	348 (0.00)	218 (0.01)	130 (0.00)
	Office visit (OV)	70868 (7.75)	35763 (9.17)	35105 (6.69)	31119 (0.42)	22428 (0.61)	8691 (0.23)
	Office observation (OO)	10017 (1.10)	4490 (1.15)	5527 (1.05)	3695 (0.05)	2613 (0.07)	1082 (0.03)
	Catheter ablation procedure (CA)	2775 (0.30)	1577 (0.40)	1198 (0.23)	4969 (0.07)	3664 (0.10)	1305 (0.03)
	Cardioversion (CV)	5901 (0.66)	3375 (0.87)	2526 (0.48)	5584 (0.08)	4542 (0.12)	1042 (0.03)
	Combined medical (ER/HA/OV/OO/CA/CV)	72910 (7.97)	36683 (9.41)	36227 (6.91)	32828 (0.44)	23524 (0.54)	9304 (0.25)
	All claims with AF ICD 10 codes	96866 (10.59)	48325 (12.39)	48541 (9.25)	42705 (0.57)	30237 (0.82)	12468 (0.33)
	Medical and Pharmacy Claims	116525 (12.74)	57641 (14.78)	58884 (11.23)	69743 (0.94)	45854 (1.24)	23889 (0.64)
Incidence	Anticoagulant	7879 (6.72)	3626 (5.29)	4253 (8.11)	5069 (0.70)	3317 (0.91)	1752 (0.48)
	Rhythm control medication	2073 (1.77)	955 (1.39)	1118 (2.13)	1570 (0.22)	1155 (0.32)	415 (0.11)
	Emergency room visit (ER)	3811 (3.25)	1738 (2.54)	2073 (3.95)	0 (0.00)	0 (0.00)	0 (0.00)
	Hospital admission (HA)	1727 (1.47)	690 (1.01)	1037 (1.98)	0 (0.00)	0 (0.00)	0 (0.00)
	Office visit (OV)	7119 (6.08)	3389 (4.94)	3730 (7.12)	4795 (0.66)	3452 (0.95)	1343 (0.37)
	Office observation (OO)	2036 (1.74)	933 (1.36)	1103 (2.10)	885 (0.12)	612 (0.17)	273 (0.08)
	Catheter ablation procedure (CA)	547 (0.47)	333 (0.49)	214 (0.41)	1031 (0.14)	757 (0.21)	274 (0.08)
	Cardioversion (CV)	1353 (1.15)	746 (1.09)	607 (1.16)	1279 (0.18)	1035 (0.28)	244 (0.07)
	Combined medical (ER/HA/OV/OO/CA/CV)	9513 (8.12)	4534 (6.61)	4979 (9.50)	4909 (0.67)	3535 (0.97)	1374 (0.38)
	All claims with AF ICD 10 codes	10494 (8.96)	4915 (7.17)	5579 (10.64)	6730 (0.93)	4751 (1.31)	1979 (0.54)
	Medical and Pharmacy Claims	18002 (15.36)	8463 (12.35)	9539 (18.20)	9451 (1.30)	6303 (1.73)	3148 (0.87)

c. Prevalence and incidence targets as % of integrated medical/pharmacy criteria

		≥ 65 years			< 65 years		
	Healthcare Service Variable	Overall	Male	Female	Overall	Male	Female
Prevalence	Anticoagulant medication	51.2	49.6	52.8	53.5	52.0	56.5
	Rhythm control medication	11.6	11.3	11.8	15.2	16.2	13.4
	Emergency room visit (ER)	21.3	19.6	23	1.3	1.2	1.4
	Hospital admission (HA)	6.8	5.7	7.8	0.5	0.5	0.5
	Office visit (OV)	60.6	62.0	59.6	44.6	48.9	36.4
	Office observation (OO)	8.6	7.8	9.4	5.3	5.7	4.5
	Catheter ablation procedure (CA)	2.4	2.7	2	7.1	8.0	5.5
	Cardioversion (CV)	5.1	5.9	4.3	8	9.9	4.4
	Combined medical (ER/HA/OV/OO/CA/CV)	62.6	63.6	61.5	47.1	51.3	38.9
	All claims with AF ICD 10 codes	83.1	83.8	82.4	61.2	65.9	52.2
Incidence	Anticoagulant medication	43.8	42.8	44.6	53.6	52.6	55.7
	Rhythm control medication	11.5	11.3	11.7	16.6	18.3	13.2
	Emergency room visit (ER)	21.2	20.5	21.7	0.0	0.0	0.0
	Hospital admission (HA)	9.6	8.2	10.9	0.0	0.0	0.0
	Office visit (OV)	39.5	40.0	39.1	50.7	54.8	42.7
	Office observation (OO)	11.3	11.0	11.6	9.4	9.7	8.7
	Catheter ablation procedure (CA)	3.0	3.9	2.2	10.9	12.0	8.7
	Cardioversion (CV)	7.5	8.8	6.4	13.5	16.4	7.8
	Combined medical (ER/HA/OV/OO/CA/CV)	52.8	53.6	52.2	51.9	56.1	43.6
	All claims with AF ICD 10 codes	58.3	58.1	58.5	71.2	75.4	62.9

Table 2 AF Prevalence and incidence by age groups using diversified medical and pharmacy criteria. Values are in numbers (%)

2a prevalence

Healthcare Service Variable	Age group (years)					
	< 45	45-54	55-64	65-74	75-84	≥ 85
Anticoagulant medication	7671 (0.17)	13261 (0.29)	16395 (1.49)	26075 (5.35)	23665 (7.85)	9950 (7.94)
Rhythm control medication	1482 (0.03)	3821 (0.22)	5328 (0.49)	6368 (1.31)	5187 (1.72)	1927 (1.54)
Emergency room visit (ER)	70 (0.00)	280 (0.02)	534 (0.05)	9311 (1.91)	10209 (3.39)	5339 (4.26)
Hospital admission (HA)	22 (0.00)	96 (0.01)	230 (0.02)	3381 (0.69)	3199 (1.06)	1347 (1.07)
Office visit (OV)	4352 (0.10)	10643 (0.60)	16124 (1.47)	28406 (5.83)	29070 (9.64)	13392 (10.68)
Office observation (OO)	601 (0.01)	1338 (0.08)	1756 (0.16)	3715 (0.76)	4087 (1.36)	2215 (1.77)
Catheter ablation procedure (CA)	828 (0.02)	1740 (0.10)	2401 (0.22)	1835 (0.38)	833 (0.28)	107 (0.09)
Cardioversion (CV)	824 (0.02)	1960 (0.11)	2800 (0.25)	3116 (0.64)	2312 (0.77)	473 (0.38)
Combined medical (ER/HA/OV/OO/CA/CV)	4636 (0.10)	11220 (0.64)	16972 (1.55)	29196 (5.99)	29846 (9.90)	13868 (11.06)
All claims with AF ICD 10 codes	6684 (0.15)	14808 (0.84)	21213 (1.93)	37887 (7.77)	38707 (12.84)	20272 (16.17)
Medical and Pharmacy Claims	13998 (0.31)	24735 (1.41)	31010 (2.82)	47589 (9.76)	45663 (15.14)	23273 (18.57)

2b incidence

Healthcare Service Variable	Age group (years)					
	< 45	45-54	55-64	65-74	75-84	≥ 85
Anticoagulant medication	903 (0.24)	1787 (0.85)	2379 (1.66)	3635 (7.35)	3171 (6.72)	1073 (14.47)
Rhythm control medication	195 (0.05)	546 (0.26)	829 (0.58)	1002 (2.03)	824 (1.75)	247 (3.33)
Emergency room visit (ER)	0 (0.00)	0 (0.00)	0 (0.00)	1579 (3.19)	1613 (3.42)	619 (8.35)
Hospital admission (HA)	0 (0.00)	0 (0.00)	0 (0.00)	733 (1.48)	724 (1.53)	270 (3.64)
Office visit (OV)	651 (0.17)	1642 (0.78)	2502 (1.74)	3165 (6.40)	2966 (6.29)	988 (13.32)
Office observation (OO)	126 (0.03)	301 (0.14)	458 (0.32)	822 (1.66)	872 (1.85)	342 (4.61)
Catheter ablation procedure (CA)	140 (0.04)	357 (0.17)	534 (0.37)	370 (0.75)	162 (0.34)	15 (0.20)
Cardioversion (CV)	163 (0.04)	445 (0.21)	671 (0.47)	731 (1.48)	535 (1.13)	87 (1.17)
Combined medical (ER/HA/OV/OO/CA/CV)	671 (0.18)	1694 (0.80)	2544 (1.77)	4148 (8.38)	3968 (8.41)	1397 (18.84)
All claims with AF ICD 10 codes	993 (0.27)	2359 (1.12)	3378 (2.35)	4485 (9.06)	4263 (9.04)	1746 (23.54)
Medical and Pharmacy Claims	1730 (0.46)	3384 (1.61)	4337 (3.02)	7795 (15.75)	7292 (15.46)	2915 (39.31)

Table 3 Analysis of individual co-morbidity profiles for AF prevalent and incident cases. Values are numbers (%)

	Characteristics	≥ 65 years				< 65 years			
		Overall	Male	Female	Pr > ChiSq	Overall	Male	Female	Pr > ChiSq
Prevalence	Heart failure	51020 (43.8)	24968 (43.3)	26052 (44.2)	0.097	12617 (18.1)	8981 (18.6)	3636 (15.2)	<0.0001
	Hypertension	99521 (85.4)	48755 (84.6)	50766 (86.2)	<0.0001	43323 (62.1)	29861 (65.1)	13462 (56.4)	<0.0001
	Diabetes mellitus	33072 (28.4)	17375 (30.1)	15697 (26.7)	<0.0001	10388 (14.9)	7184 (15.7)	3204 (13.4)	<0.0001
	Prior stroke and thromboembolic events	22686 (19.5)	10753 (18.7)	11933 (20.3)	<0.0001	6698 (9.6)	4031 (8.8)	2667 (11.2)	<0.0001
	Vascular disease	38982 (33.5)	20252 (35.1)	18730 (31.8)	<0.0001	9628 (13.8)	6877 (15.0)	2751 (11.5)	<0.0001
	Valvular disease	48381 (41.5)	23070 (40.0)	25311 (43.0)	<0.0001	19122 (27.4)	12589 (27.5)	6533 (27.3)	0.4564
	Coronary artery disease	51801 (44.5)	29709 (51.5)	22092 (37.5)	<0.0001	13514 (19.4)	10400 (22.7)	3114 (13.0)	<0.0001
	Obstructive sleep apnea	5101 (4.4)	2982 (5.2)	2119 (3.6)	<0.0001	6221 (8.9)	4607 (10.0)	1614 (6.8)	<0.0001
	Chronic kidney disease	35260 (30.3)	18140 (31.5)	17120 (29.1)	<0.0001	5799 (8.3)	4055 (8.8)	1744 (7.3)	<0.0001
Incidence	Heart failure	9089 (50.5)	4227 (49.9)	4862 (51.0)	0.6830	1985 (21.0)	1412 (22.4)	573 (18.2)	<0.0001
	Hypertension	16687 (92.7)	7789 (92.0)	8898 (93.3)	<0.0001	6304 (66.7)	4384 (69.6)	1920 (61.0)	<0.0001
	Diabetes mellitus	5686 (31.6)	2878 (34.0)	2808 (29.4)	<0.0001	1546 (16.4)	1055 (16.7)	491 (15.6)	0.2042
	Prior stroke and thromboembolic events	4612 (25.6)	2087 (24.7)	2525 (26.5)	0.0573	1022 (10.8)	646 (10.2)	376 (11.9)	0.0103
	Vascular disease	7730 (42.9)	3854 (45.5)	3876 (40.6)	<0.0001	1581 (16.7)	1149 (18.2)	432 (13.7)	<0.0001
	Valvular disease	9851 (54.7)	4482 (53.0)	5369 (56.3)	<0.0001	3273 (34.6)	2184 (34.7)	1089 (34.6)	0.9080
	Coronary artery disease	9226 (51.2)	5014 (59.2)	4212 (44.2)	<0.0001	2224 (23.5)	1729 (27.4)	495 (15.7)	<0.0001
	Obstructive sleep apnea	981 (5.4)	574 (6.8)	407 (4.3)	<0.0001	1109 (11.7)	840 (13.3)	269 (8.5)	<0.0001
	Chronic kidney disease	6382 (35.5)	3091 (36.5)	3291 (34.5)	<0.0001	932 (9.9)	668 (10.6)	264 (8.4)	0.0011

Table 4 AF Prevalence and incidence for overall and ≥ 65 year AF cohorts with and without multi-morbidity. Values are in numbers (% for prevalence and new cases/1000 person-years for incidence)

4a prevalence

	Group 1	Group 2	
Cohort	'Claims/ICD10 + pharmacy codes'	'Claims/ICD 10 only'	% change with respect to ICD 10 only
Overall AF	186268 (0.0223)	139571 (0.0167)	0.335
Overall AF + ≥ 1 comorbidity (conventional multi-morbidity definition as ≥ 2 comorbidities)	160420 (0.0192)	130368 (0.0156)	0.231
Overall AF + ≥ 2 non-AF comorbidities	126874 (0.0152)	107096 (0.0128)	0.188
AF for age ≥ 65 years	116525 (0.1274)	96866 (0.1059)	0.203
AF for age ≥ 65 years + ≥ 1 comorbidities	107240 (0.1173)	94473 (0.1033)	0.136
AF for age ≥ 65 years + ≥ 2 comorbidities	92769 (0.1014)	107096 (0.0909)	0.116

4b incidence

	Group 1	Group 2	
Cohort	'Claims/ICD10 + pharmacy codes'	'Claims/ICD 10 only'	% change with respect to ICD 10 only
Overall AF	27453 (3.25)	17224 (2.04)	0.594
Overall AF + ≥ 1 comorbidity (conventional multi-morbidity definition as ≥ 2 comorbidities)	25176 (2.98)	16211 (1.92)	0.553
Overall AF + ≥ 2 non-AF comorbidities	21418 (2.54)	13753 (1.63)	0.557
AF for age ≥ 65 years	18002 (15.36)	10494 (8.96)	0.715
AF for age ≥ 65 years + ≥ 1 comorbidities	17510 (14.94)	10335 (8.82)	0.694
AF for age ≥ 65 years + ≥ 2 comorbidities	16070 (13.71)	9489 (8.10)	0.694

	Overall			Male			Female		
Age group (years)	Estimate	95% CI LL	95% CI UL	Estimate	95% CI LL	95% CI UL	Estimate	95% CI LL	95% CI UL
< 45	0.00464	0.00457	0.00470	0.00594	0.00584	0.00605	0.00329	0.00320	0.00337
45-54	0.01606	0.01589	0.01623	0.02180	0.02151	0.02208	0.01048	0.01028	0.01067
55-64	0.03022	0.02994	0.03050	0.04138	0.04091	0.04184	0.01950	0.01918	0.01982
65-74	0.15754	0.15653	0.15856	0.19291	0.19123	0.19458	0.13078	0.12953	0.13211
75-84	0.15457	0.15354	0.15560	0.16716	0.16552	0.16880	0.14543	0.14411	0.14686
≥ 85	0.14198	0.14047	0.14349	0.13822	0.13573	0.14070	0.14410	0.14220	0.14616