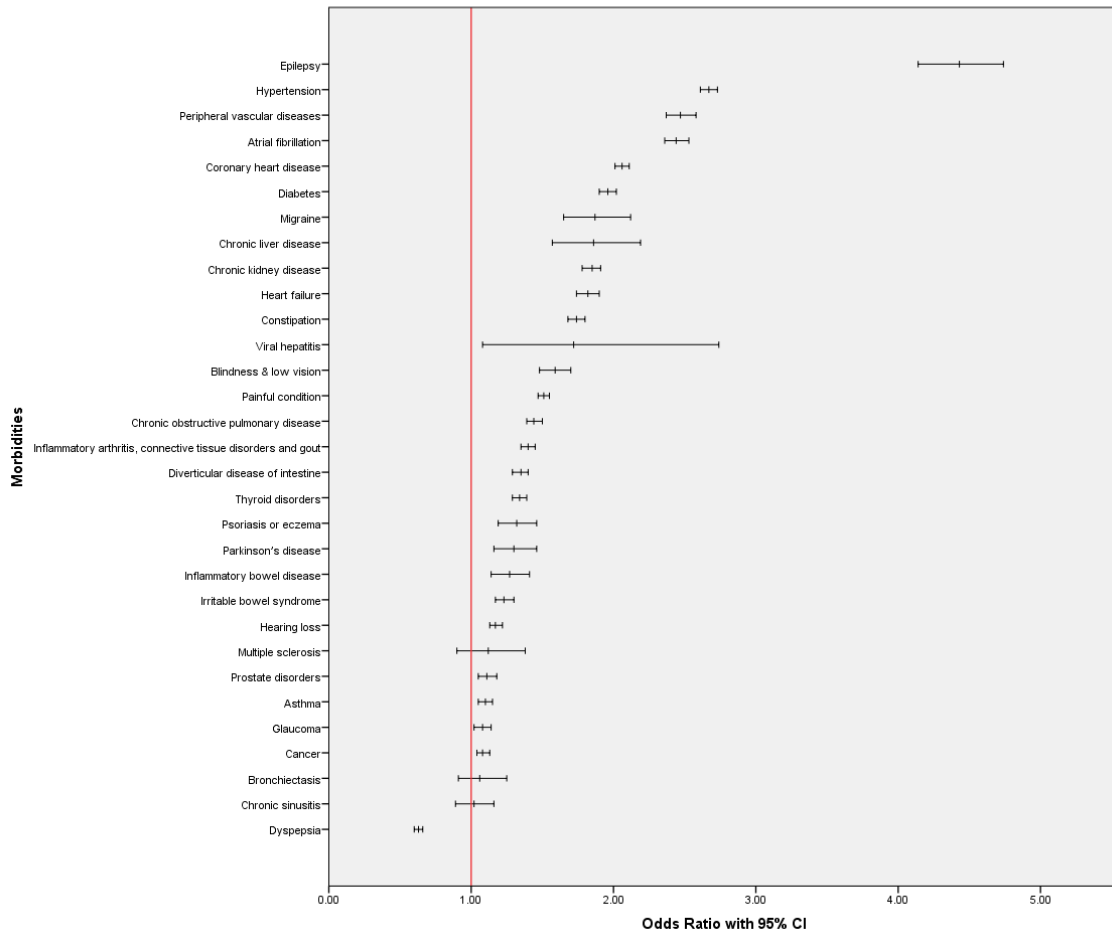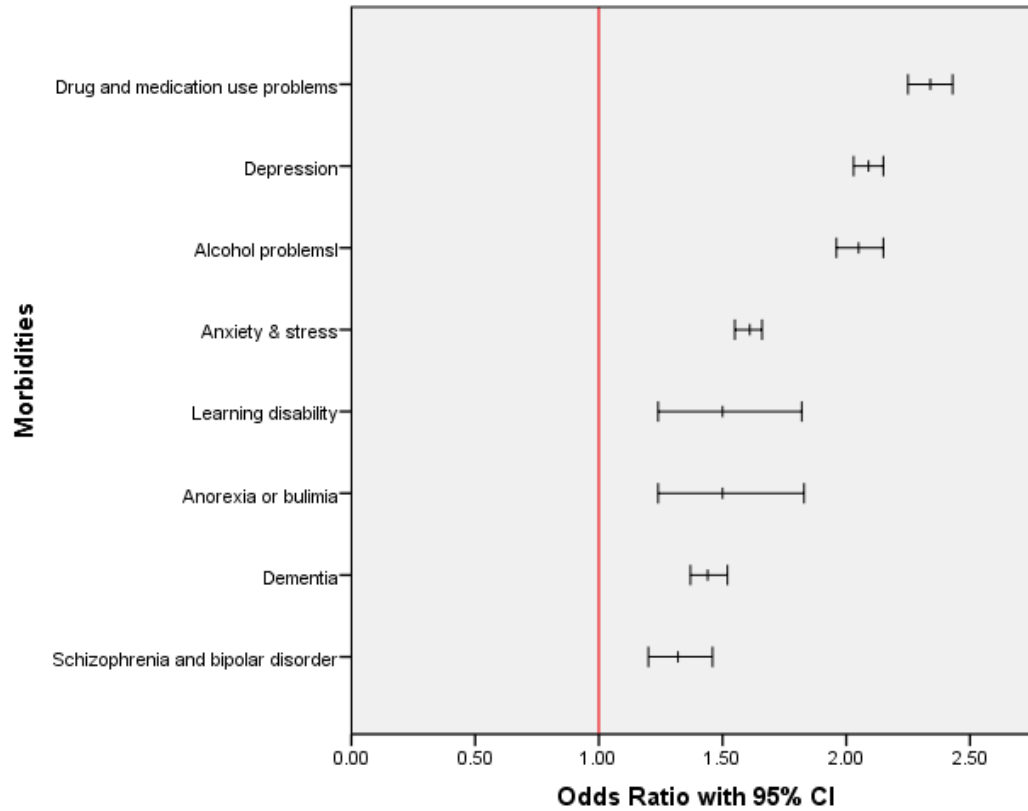**Table 1. Stroke status and number of morbidities (N=1,424,378)**

	Stroke N (%) 35690 (100)	No stroke (%) 1388688 (100)	Unadjusted Odds Ratio (95% CI) [a]	Age, gender and deprivation adjusted Odds Ratio (95% CI) [a]
Total number of morbidities[b]				
None	2053 (5.8)	721430 (52.0)	1	1
One-three	17750 (49.7)	551295 (39.7)	11.31 (10.81 to 11.85)	4.35 (4.15 to 4.56)
Four-six	12300 (34.5)	100500 (7.2)	43.01 (41.03 to 45.09)	8.59 (8.17 to 9.04)
Seven or more	3587 (10.1)	15463 (1.1)	81.52 (77.04 to 86.26)	12.81 (12.05 to 13.61)
Number of physical morbidities[b]				
None	2769 (7.8)	800202 (57.6)	1	1
One-three	20716 (58.0)	510846 (36.8)	11.72 (11.26 to 12.20)	4.03 (3.86 to 4.20)
Four-six	10414 (29.2)	70709 (5.1)	42.56 (40.79 to 44.41)	7.32 (6.99 to 7.67)
Seven or more	1791 (5.0)	6931 (0.5)	74.68 (70.05 to 79.61)	10.33 (9.64 to 11.05)
Number of mental morbidities				
None	21961 (61.5)	1163095 (83.8)	1	1
One-three	13533 (37.9)	223739 (16.1)	3.20 (3.13 to 3.27)	2.08 (2.04 to 2.13)
Four or more	196 (0.5)	1854 (0.1)	5.60 (4.83 to 6.49)	3.56 (3.03 to 4.20)

[a] all p<0.001

[b] excluding stroke

Figure 1- Odds Ratios (with 95% CI) for physical morbidities in relation to stroke status (adjusted for age, gender, deprivation). Stroke N = 35690. Stroke-free N= 1388688.

Figure 2 - Odds Ratios (with 95% CI) for mental health morbidities in relation to stroke status (adjusted for age, gender, deprivation). Stroke N= 35690. Stroke-free N= 1388688.

Note: Drug related problems is any Read code which records psychoactive substance abuse which includes both drug misuse and prescription drug problems of multiple sources

Table 2. Stroke status and number of repeat medications (N=1,424,378)

	Stroke N (%) 35690 (100)	No stroke N (%) 1388688 (100)	Unadjusted Odds Ratio (95% CI) [a]	Age, gender and deprivation adjusted Odds Ratio (95% CI) [a]	Age, gender, deprivation and morbidity count adjusted Odds Ratio (95% CI) [a]
Number of medications					
None	2447 (6.9%)	863688 (62.2%)	1	1	1
One-two	3038 (8.5%)	240721 (17.3%)	4.45 (4.22 to 4.70)	2.38 (2.26 to 2.52)	2.29 (2.17 to 2.42)
Three-four	6566 (18.4%)	122518 (8.8%)	18.92 (18.05 to 19.82)	6.25 (5.95 to 6.57)	5.78 (5.49 to 6.08)
Five-six	8185 (22.9%)	75512 (5.4%)	38.26 (36.55 to 40.05)	10.50 (9.99 to 11.03)	9.36 (8.89 to 9.86)
Seven-eight	6721 (18.8%)	43344 (3.1%)	54.73 (52.20 to 57.38)	13.90 (13.20 to 14.63)	11.94 (11.29 to 12.62)
Nine-ten	4219 (11.8%)	22536 (1.6%)	66.08 (62.76 to 69.57)	16.22 (15.34 to17.15)	13.44 (12.65 to 14.29)
Eleven or more	4514(12.6%)	20369 (1.5%)	78.22 (74.32 to 82.32)	20.13 (19.05 to 21.27)	15.84 (14.86 to 16.88)

[a] all p<0.001

	Stroke N (%) 35690 (100)	No stroke N (%) 1388688(100)	Unadjusted Odds Ratio (95% CI) [a]	Adjusted Odds Ratio (95% CI) [a,b]
Men	18071 (50.6)	681358 (49.1)	1.07 (1.04 to 1.09)[c]	1.49 (1.46 to 1.53)[c]
Age group				
18-24	50 (0.1)	151643 (10.9)	1	1
25-34	157 (0.4)	229239 (16.5)	2.08 (1.51 to 2.86)	2.08 (1.52 to 2.86)
35-44	592 (1.7)	278401 (20.0)	6.45 (4.83 to 8.61)	6.53 (4.89 to 8.71)
45-54	2019 (5.7)	251775 (18.1)	24.32 (18.37 to 32.20)	24.80 (18.73 to 32.83)
55-64	5650 (15.8)	213683 (15.4)	80.19 (60.70 to 105.94)	82.58 (62.51 to 109.10)
65-74	9847 (27.6)	145433 (10.5)	205.35 (155.51 to 271.16)	212.61 (161.01 to 280.74)
75+	17375 (48.7)	118514 (8.5)	444.64 (336.83 to 586.95)	476.65 (361.07 to 629.23)
Deprivation quintile				
1 affluent	5993 (16.8)	266036 (19.2)	1	1
2	7724 (21.6)	296430 (21.3)	1.16 (1.12 to 1.20)	1.09 (1.05 to 1.12)

Supplementary File 1. Stroke status in relation to demographic characteristics (N=1,424,378)

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3	8251 (23.1)	313996 (22.6)	1.17 (1.13 to 1.21)	1.20 (1.16 to 1.24)
4	7008 (19.6)	264376 (19.0)	1.18 (1.14 to 1.22)	1.28 (1.24 to 1.33)
5 deprived	6714 (18.8)	247850 (17.8)	1.20 (1.16 to 1.25)	1.42 (1.37 to 1.47)

[a] all p values <0.001
[b] adjustments were made for all other demographic variables e.g. age and deprivation when examining gender.
[c] reference category is women

Supplementary File 2. Stroke status and prevalence of physical morbidities (N=1,424,378)

	Stroke N (%) 35690 (100)	No stroke N (%) 1388688 (100)	Unadjusted Odds Ratio (95% CI)[a,b]	Age, gender and deprivation adjusted Odds Ratio (95% CI) [a,b]
Epilepsy	1186 (3.3)	11198 (0.8)	4.23 (3.98 to 4.49)	4.43 (4.14 to 4.74)
Hypertension	21742 (60.9)	212572 (15.3)	8.62 (8.44 to 8.81)	2.67 (2.61 to 2.73)
Peripheral vascular diseases	3286 (9.2)	19954 (1.4)	6.96 (6.69 to 7.23)	2.47 (2.37 to 2.58)
Atrial fibrillation	4652 (13.0)	19324 (1.4)	10.62 (10.27 to 10.99)	2.44 (2.36 to 2.53)
Coronary heart disease	10518 (29.5)	70949 (5.1)	7.76 (7.58 to 7.95)	2.06 (2.01 to 2.11)
Diabetes	6697 (18.8)	68134 (4.9)	4.48 (4.36 to 4.60)	1.96 (1.90 to 2.02)
Migraine	273 (0.8)	8978 (0.6)	1.19 (1.05 to 1.34)	1.87 (1.65 to 2.12)
Chronic liver disease	159 (0.4)	2455 (0.2)	2.53 (2.15 to 2.97)	1.86 (1.57 to 2.19)
Chronic kidney disease	5100 (14.3)	28466 (2.0)	7.97 (7.72 to 8.23)	1.85 (1.78 to 1.91)
Heart failure	2977 (8.3)	15922 (1.1)	7.85 (7.53 to 8.17)	1.82 (1.74 to 1.90)
Constipation	4934 (13.8)	31482 (2.3)	6.92 (6.70 to 7.14)	1.74 (1.68 to 1.80)
Viral Hepatitis	19 (0.1)	1156 (0.1)	0.64 (0.41 to 1.01) p=0.053	1.72 (1.08 to 2.74)
Blindness & low vision	1124 (3.1)	7254 (0.5)	6.19 (5.81 to 6.60)	1.59 (1.48 to 1.70)
Painful condition	7810 (21.9)	118321 (8.5)	3.01 (2.93 to 3.09)	1.51 (1.47 to 1.55)
Chronic obstructive pulmonary disease	4235 (11.9)	48872 (3.5)	3.69 (3.57 to 3.82)	1.44 (1.39 to 1.50)
Inflammatory arthritis, connective tissue	4198 (11.8)	53810 (3.9)	3.31 (3.20 to 3.42)	1.40 (1.35 to 1.45)

disorders and gout				
Diverticular disease of intestine	3472 (9.7)	30341 (2.2)	4.83 (4.65 to 5.01)	1.35 (1.29 to 1.40)
Thyroid disorders	4244 (11.9)	67699 (4.9)	2.63 (2.55 to 2.72)	1.34 (1.29 to 1.39)
Psoriasis or eczema	446 (1.2)	9923 (0.7)	1.76 (1.60 to 1.93)	1.32 (1.19 to 1.46)
Parkinson's disease	361 (1.0)	2380 (0.2)	5.95 (5.33 to 6.65)	1.30 (1.16 to 1.46)
Inflammatory bowel disease	382 (1.1)	9369 (0.7)	1.59 (1.44 to 1.77)	1.27 (1.14 to 1.41)
Irritable bowel syndrome	1539 (4.3)	50598 (3.6)	1.19 (1.13 to 1.26)	1.23 (1.17 to 1.30)
Hearing loss	3968 (11.1)	50766 (3.7)	3.30 (3.19 to 3.41)	1.17 (1.13 to 1.22)
Multiple sclerosis	92 (0.3)	3755 (0.3)	0.95 (0.78 to 1.17) p=0.650	1.12 (0.90 to 1.38) p=0.309
Prostate disorders	1424 (4.0)	13809 (1.0)	4.14 (3.91 to 4.37)	1.11 (1.05 to 1.18)
Asthma	2285 (6.4)	82220 (5.9)	1.09 (1.04 to 1.14)	1.10 (1.05 to 1.15)
Glaucoma	1544 (4.3)	14375 (1.0)	4.32 (4.10 to 4.56)	1.08 (1.02 to 1.14)
Cancer	2937 (8.2)	40727 (2.9)	2.97 (2.85 to 3.09)	1.08 (1.04 to 1.13)
Bronchiectasis	173 (0.5)	2641 (0.2)	2.56 (2.19 to 2.98)	1.06 (0.91 to 1.25) p=0.454
Chronic sinusitis	248 (0.7)	8917 (0.6)	1.08 (0.95 to 1.23) p=0.219	1.02 (0.89 to 1.16) p=0.820
Dyspepsia	2571 (7.2)	76633 (5.5)	1.33 (1.28 to 1.38)	0.63 (0.60 to 0.66)

[a] reference category is absence of each condition
[b] all p values <0.001 unless otherwise stated

Supplementary File 3. Stroke status and prevalence of mental health morbidities (N=1,424,378)

	Stroke N (%) 35690 (100)	Non stroke N (%) 1388688 (100)	Unadjusted Odds Ratio (95% CI) [a,b]	Age, gender and deprivation adjusted Odds Ratio (95% CI) [a,b]
Drug and medication use problems	3831 (10.7)	38629 (2.8)	4.20 (4.06 to 4.35)	2.34 (2.25 to 2.43)
Depression	7394 (20.7)	136549 (9.8)	2.40 (2.33 to 2.46)	2.09 (2.03 to 2.15)
Alcohol problems	2062 (5.8)	40301 (2.9)	2.05 (1.96 to 2.15)	2.05 (1.96 to 2.15)
Anxiety & stress	4026 (11.3)	51700 (3.7)	3.29 (3.18 to 3.40)	1.61 (1.55 to 1.66)
Learning disability	115 (0.3)	4899 (0.4)	0.91 (0.76 to 1.10) p=0.336	1.50 (1.24 to 1.82)
Anorexia or bulimia	118 (0.3)	5188 (0.4)	0.89 (0.74 to 1.06) p=0.189	1.50 (1.24 to 1.83)
Dementia	2075 (5.8)	9621 (0.7)	8.85 (8.43 to 9.29)	1.44 (1.37 to 1.52)
Schizophrenia and bipolar disorder	452 (1.3)	12041 (0.9)	1.47 (1.33 to 1.61)	1.32 (1.20 to 1.46)
[a] reference category is absence of each condition [b] all p values <0.001 unless otherwise stated				

Supplementary file 4 **Stroke status and number of morbidities and repeat medications for two age groups**

	Stroke N (%) 35690 (100)	No stroke (%) 1388688 (100)	Gender and deprivation adjusted Odds Ratio (95% CI) [a]
Total number of morbidities[b] (Age group 35-44)			
None	162 (27.4)	179346 (64.4)	1
One-three	332 (56.1)	92652 (33.3)	3.93 (3.25 to 4.75)
Four-six	84 (14.2)	6069 (2.2)	14.77 (11.29 to 19.32)
Seven or more	14 (2.4)	334 (0.1)	45.19 (25.83 to 79.04)
Number of morbidities[b] (Age group 75plus)			
None	435 (2.5)	11846 (10.0)	1
One-three	7620 (43.9)	64934 (54.8)	3.23 (2.92 to 3.56)
Four-six	7009 (40.3)	34197 (28.9)	5.69 (5.15 to 6.28)
Seven or more	2311 (13.3)	7537 (6.4)	8.56 (7.70 to 9.53)
Number of medications (Age 35-74)			
None	180 (30.4)	217,943 (78.3)	1
One-two	135 (22.8)	42,772 (15.4)	3.86 (3.06 to 4.83)
Three-four	99 (16.7)	10,688 (3.8)	11.12 (8.68 to 14.25)
Five-six	65 (11.0)	3,912 (1.4)	19.83 (14.89 to 26.42)
Seven-eight	46 (7.8)	1,713 (0.6)	32.10 (23.10 to 44.60)
Nine-ten	37 (6.3)	735 (0.3)	59.91 (41.66 to 86.16)
Eleven or more	30 (5.1)	638 (0.2)	56.14 (37.77 to 83.43)
Number of medications (Age 75 plus)			
None	970 (5.6)	16,153 (13.6)	1
One-two	1,017 (5.9)	20,805 (17.6)	0.82 (0.75 to 0.90)

Three-four	2,897 (16.7)	26,558 (22.4)	1.85 (1.72 to 2.00)
Five-six	4,147 (23.9)	23,290 (19.7)	3.04 (2.83 to 3.27)
Seven-eight	3,690 (21.2)	15,616 (13.2)	4.05 (3.76 to 4.36)
Nine-ten	2,376 (13.7)	8,760 (7.4)	4.68 (4.32 to 5.07)
Eleven or more	2,278 (13.1)	7,332 (6.2)	5.38 (4.97 to 5.83)

all p values <0.001

Supplementary file 5

Definitions of 31 physical health conditions assessed.

Condition	Variable Definition
Coronary heart disease	Read code ever recorded
Chronic kidney disease	Read code ever recorded
Asthma (active)	Read code ever recorded AND any prescription in last year
Atrial fibrillation	Read code ever recorded
Epilepsy	Read code ever recorded AND epilepsy prescription in last year
New cancer in the last 5 years	Read code first recorded in last 5 years (Relevant Read Code recorded)
Thyrotoxicosis/Thyroid disorders (includes hypothyroidism)	Read code ever recorded (Relevant Read Code recorded)
Diabetes	Read code ever recorded
Parkinson's disease	Read code ever recorded (Relevant Read Code recorded)

Multiple sclerosis	Read code ever recorded (Relevant Read Code recorded)
Visual impairment	Read code ever recorded (Relevant Read Code recorded)
Glaucoma	Read code ever recorded (Relevant Read Code recorded)
Hearing loss	Read code ever recorded (Relevant Read Code recorded)
Hypertension	Read code ever recorded (Relevant Read Code recorded)
Heart failure	Read code ever recorded
Peripheral vascular diseases	Read code ever recorded (Relevant Read Code recorded)
Chronic sinusitis	Read code ever recorded (Relevant Read Code recorded)
Bronchitis, emphysema & other chronic obstructive pulmonary diseases	Read code ever recorded (Relevant Read Code recorded)
Bronchiectasis	Read code ever recorded (Relevant Read Code recorded)
Crohn's disease & ulcerative colitis	Read code ever recorded (Relevant Read Code recorded)
Diverticular disease of intestine	Read code ever recorded (Relevant Read Code recorded)
Rheumatoid arthritis, other inflammatory polyarthropathies & systematic connective tissue disorders	Read code ever recorded (Relevant Read Code recorded)
Hyperplasia of prostate & prostate disorders	Read code ever recorded (Relevant Read Code recorded)
Psoriasis or eczema	Read code ever recorded (M11% & M12%) AND ≥ 4 prescription in last year (BNF 13.4, excluding hydrocortisone, & BNF 13.5)

Viral Hepatitis	Read code ever recorded (Relevant Read Code recorded)
Irritable bowel syndrome	Read code ever recorded (Relevant Read Code recorded) OR ≥ 4 antispasmodic prescription in last year (POM only, exclude kolanticon, alverine citrate & peppermint oil)
Cirrhosis/chronic liver disease/alcoholic liver disease	Read code ever recorded (Relevant Read Code recorded)
Migraine	≥ 4 anti-migraine prescriptions in last year (BNF 040704%, POM only exclude migraleve)
Dyspepsia	≥ 4 prescriptions in last year BNF 0103% excluding antacids AND NOT ≥4 NSAIDS OR ≥4 aspirin/clopidogrel
Constipation	≥4 prescriptions in last year, BNF 0106%
Pain	≥4 specified analgesic prescriptions in last year (opioids/>8mg co-codamol/NSAIDS) OR ≥4 specified anti-epileptics in the absence of an epilepsy Read code in last year (gabapentin, pregabalin and carbamazepine)

Definitions of 8 mental health conditions assessed

Condition	Variable Definition
Anorexia or bulimia	Read code ever recorded
Drugs misuse (Other psychoactive substance misuse)	Read code ever recorded
Anxiety & other neurotic, stress related & somatoform disorders	Read code in last 12 months OR ≥ 4 anxiolytic/hypnotic prescriptions in last 12 months OR ≥ 4 10/25mg amitriptyline in last 12 months & do not meet the criteria for 'Pain'
Depression	Read code recorded in last 12 months OR ≥4 anti-depressant prescriptions (excluding low dose tricyclics) in last 12 months
Alcohol misuse	Read code ever recoded
Schizophrenia (and related non-organic psychosis) or bipolar disorder	Read code ever recorded/recorded in last 12 months (code dependent) OR Lithium prescribed in last 168 days
Dementia	Read code ever recorded
Learning disability	Read code ever recorded

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