

Supplemental Material

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Supplemental Tables

Supplemental Table 1. Meta-annotations performance results for Diagnosis and Status

Meta-Annotation	Values	F1 (macro/weighted)	P (macro/weighted)	R (macro/weighted)
Diagnosis	Patient / Other	0.94 / 0.94	0.95 / 0.95	0.92 / 0.94
Status	Affirmed / Other	0.89 / 0.98	0.94 / 0.98	0.85 / 0.98

Supplemental Table 2. Prevalence estimates and sex differences within the whole SMI cohort and SSD and BD subgroups.

	Total Cohort		SSD		p-value	BD		p- value
	Female	Male	Female	Male		Female	Male	
Diabetes	1282 (15.8)	1403 (15)	1021 (18.8)	1187 (15.6)	<.001	261 (9.7)	216 (12.1)	.190
Hypertension ***	1325 (16.3)	1212 (12.9)	1060 (19.6)	1010 (13.3)	<.001	265 (9.8)	202 (11.4)	1.000
Asthma **	869 (10.7)	852 (9.1)	559 (10.3)	732 (9.6)	1.000	310 (11.5)	120 (6.7)	<.001
Arthritis ***	657 (8.1)	297 (3.2)	471 (8.7)	231 (3.0)	<.001	186 (6.9)	66 (3.7)	<.001
Epilepsy	349 (4.3)	450 (4.8)	253 (4.7)	399 (5.3)	1.000	96 (3.6)	51 (2.9)	1.000
Cerebrovascular diseases	367 (4.5)	361 (3.9)	265 (4.9)	308 (4.1)	.499	102 (3.8)	53 (3.0)	1.000
Eczema *	331 (4.1)	285 (3.0)	238 (4.4)	241 (3.2)	<.01	93 (3.4)	44 (2.5)	1.000
Migraine ***	369 (4.5)	194 (2.1)	217 (4.0)	155 (2.0)	<.001	152 (5.6)	39 (2.2)	<.001
Ischaemic heart disease	249 (3.1)	312 (3.3)	196 (3.6)	239 (3.1)	1.000	53 (2.0)	73 (4.2)	<.001
Chronic Obstructive Lung diseases	237 (2.9)	239 (2.5)	153 (2.8)	189 (2.5)	1.000	84 (3.1)	50 (2.8)	1.000
Chronic Kidney disease	158 (1.9)	121 (1.3)	104 (1.9)	75 (1.0)	<.001	54 (2.0)	46 (2.6)	1.000
Parkinson disease	113 (1.4)	153 (1.6)	81 (1.5)	120 (1.6)	1.000	32 (1.2)	33 (1.9)	1.000
Heart failure	123 (1.5)	99 (1.0)	105 (1.9)	82 (1.1)	.001	18 (0.7)	17 (1.0)	1.000
Psoriasis	76 (0.9)	103 (1.1)	45 (0.8)	84 (1.1)	1.000	31 (1.1)	19 (1.1)	1.000
Atrial fibrillation	65 (0.8)	68 (0.7)	50 (0.9)	50 (0.7)	1.000	15 (0.6)	18 (1.0)	1.000
Transient Ischaemic Attack	79 (1.0)	51 (0.5)	53 (1.0)	38 (0.5)	.037	26 (1.0)	13 (0.7)	1.000
Inflammatory Bowel diseases	26 (0.3)	14 (0.1)	18 (0.3)	7 (0.1)	.080	8 (0.3)	7 (0.4)	1.000

Multiple Sclerosis	17 (0.2)	15 (0.2)	9 (0.2)	10 (0.1)	-	8 (0.3)	5 (0.3)	-
Chronic liver disease	10 (0.1)	12 (0.1)	9	11 (0.1)	-	1 (0.0)	1 (0.1)	-
Chronic Sinusitis	3 (0.0)	3 (0.0)	3	3 (0.0)	-	0 (0.0)	0 (0.0)	-

Note. *** p < .001; ** p < .01; * p < .05 for comparisons between male and female groups in the whole SMI cohort

Supplemental Table 3. Prevalence for each condition for the whole cohort and diagnoses subgroups and across age ranges at first SMI diagnosis.

	Total					SSD					BD						
	15-34	35-44	45-54	55-64	65+	15-34	35-44	45-54	55-64	65+	15-34	35-44	45-54	55-64	65+		
Total	7497	3736	2783	1525	1959	5607	2792	2057	1067	1496		1890	944	726	458	463	
Diabetes***	697 (9.3)	559 (15.0)	531 (19.1)	371 (24.3)	528 (27.0)	591 (10.5)	479 (17.2)	439 (21.3)	284 (26.6)	415 (27.7)	p < 0.001	106 (5.6)	80 (8.5)	92 (12.7)	87 (19.0)	113 (24.4)	p < 0.001
Hypertension***	472 (6.3)	426 (11.4)	514 (18.5)	416 (27.)3	709 (36.2)	412 (7.3)	372 (13.3)	411 (20.0)	313 (29.3)	562 (37.6)	p < 0.001	60 (3.2)	54 (5.7)	103 (14.2)	103 (22.5)	147 (31.7)	p < 0.001
Asthma***	820 (10.9)	347 (9.3)	297 (10.7)	126 (8.3)	132 (6.7)	635 (11.3)	248 (8.9)	218 (10.6)	89 (8.3)	101 (6.8)	p < 0.001	185 (9.8)	99 (10.5)	79 (10.9)	37 (8.1)	31 (6.7)	p = 1.000
Arthritis***	125 (1.7)	154 (4.1)	229 (8.2)	167 (11.0)	279 (14.2)	93 (1.7)	120 (4.3)	159 (7.7)	118 (11.1)	212 (14.2)	p < 0.001	32 (1.7)	34 (3.6)	70 (9.6)	49 (10.7)	67 (14.5)	p < 0.001
Epilepsy	339 (4.5)	188 (5.0)	133 (4.8)	67 (4.4)	72 (3.7)	276 (4.9)	154 (5.5)	112 (5.4)	55 (5.2)	55 (3.7)	1.000	63 (3.3)	34 (3.6)	21 (2.9)	12 (2.6)	17 (3.7)	1.000
CVA***	166 (2.2)	112 (3.0)	122 (4.4)	114 (7.5)	214 (10.9)	143 (2.6)	87 (3.1)	95 (4.6)	84 (7.9)	164 (11.0)	p < 0.001	23 (1.2)	25 (2.6)	27 (3.7)	30 (6.6)	50 (10.8)	p < 0.001
Eczema	310 (4.1)	115 (3.1)	79 (2.8)	50 (3.3)	62 (3.2)	244 (4.4)	88 (3.2)	58 (2.8)	37 (3.5)	52 (3.5)	0.120	66 (3.5)	27 (2.9)	21 (2.9)	13 (2.8)	10 (2.2)	1.000
Migraine***	300 (4.0)	122 (3.3)	87 (3.1)	32 (2.1)	23 (1.2)	207 (3.7)	73 (2.6)	53 (2.6)	24 (2.2)	15 (1.0)	p < 0.001	93 (4.9)	49 (5.2)	34 (4.7)	8 (1.7)	8 (1.7)	0.011
Isc heart disease***	111 (1.5)	73 (2.0)	105 (3.8)	95 (6.2)	177 (9.0)	96 (1.7)	60 (2.1)	80 (3.9)	65 (6.1)	134 (9.0)	p < 0.001	15 (0.8)	13 (1.4)	25 (3.4)	30 (6.6)	43 (9.3)	p < 0.001
COPD***	39 (0.5)	58 (1.6)	119 (4.3)	115 (7.5)	145 (7.4)	29 (0.5)	40 (1.4)	87 (4.2)	82 (7.7)	104 (7.0)	p < 0.001	10 (0.5)	18 (1.9)	32 (4.4)	33 (7.2)	41 (8.9)	p < 0.001
CKD***	12 (0.2)	18 (0.5)	41 (1.5)	55 (3.6)	153 (7.8)	9 (0.2)	14 (0.5)	28 (1.4)	33 (3.1)	95 (6.4)	p < 0.001	3 (0.2)	4 (0.4)	13 (1.8)	22 (4.8)	58 (12.5)	-
PD***	70 (0.9)	33 (0.9)	37 (1.3)	41 (2.7)	85 (4.3)	57 (1.0)	22 (0.8)	27 (1.3)	32 (3.0)	63 (4.2)	p < 0.001	13 (0.7)	11 (1.2)	10 (1.4)	9 (2.0)	22 (4.8)	p < 0.001
HF***	18 (0.2)	30 (0.8)	42 (1.5)	40 (2.6)	92 (4.7)	17 (0.3)	30 (1.1)	38 (1.8)	29 (2.7)	73 (4.9)	p < 0.001	1 (0.1)	0 (0.0)	4 (0.6)	11 (2.4)	19 (4.1)	-
Psoriasis	67 (0.9)	33 (0.9)	37 (1.3)	17 (1.1)	25 (1.3)	54 (1.0)	25 (0.9)	25 (1.2)	9 (0.8)	16 (1.1)	1.000	13 (0.7)	8 (0.8)	12 (1.7)	8 (1.7)	9 (1.9)	0.450
Atrial fibrillation***	14 (0.2)	7 (0.2)	12 (0.4)	19 (1.2)	81 (4.1)	11 (0.2)	6 (0.2)	8 (0.4)	12 (0.1)	63 (4.2)	p < 0.001	3 (0.20)	1 (0.1)	4 (0.6)	7 (1.5)	18 (3.9)	-
TIA***	20 (0.3)	18 (0.5)	19 (0.7)	23 (1.5)	50 (2.6)	15 (0.3)	15 (0.5)	13 (0.6)	14 (1.3)	34 (2.3)	p < 0.001	5 (0.3)	3 (0.3)	6 (0.8)	9 (2.0)	16 (3.5)	-
IBD	9 (0.1)	8 (0.2)	12 (0.4)	6 (0.4)	5 (0.3)	4 (0.1)	6 (0.2)	7 (0.3)	3 (0.3)	5 (0.3)	-	5 (0.3)	2 (0.2)	5 (0.7)	3 (0.7)	0 (0.0)	-
MS	6 (0.1)	8 (0.2)	11 (0.4)	5 (0.3)	2 (0.1)	4 (0.1)	4 (0.1)	8 (0.4)	3 (0.3)	0 (0.0)	-	2 (0.1)	4 (0.4)	3 (0.4)	2 (0.4)	2 (0.4)	-

Chronic liver disease	5 (0.1)	7 (0.2)	6 (0.2)	3 (0.2)	1 (0.1)	5 (0.1)	7 (0.3)	5 (0.2)	2 (0.2)	1 (0.1)	-	0 (0.0)	0 (0.0)	1 (0.1)	1 (0.2)	0 (0.0)	-
Chronic sinusitis	5 (0.1)	0 (0.0)	1 (0.0)	0 (0.0)	0 (0.0)	5 (0.1)	0 (0.0)	1 (0.0)	0 (0.0)	0 (0.0)	-	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	-

Note: *** p < .001; ** p < .01; * p < .05 for comparisons between age groups within the SMI cohort.

Supplemental Tables 4. Prevalence for each condition for the whole cohort and diagnoses subgroups and across ethnicities

Table 4a. Prevalence for each condition for the whole cohort and ethnicity.

	White British n=6243 (35.7%)	Irish n=346 (2.0%)	Black Caribbean n=3182 (18.2%)	Black African n=2094 (12.0%)	South Asian n=549 (3.1%)	Other [§] n=2846 (22.0%)	Unknown [§] n=1240 (7.1%)	Statistics
Diabetes	837 (13.4)	55 (15.9)	757 (23.8)	382 (18.2)	125 (22.8)	461 (12.0)	69 (5.6)	χ^2 (4) = 172.49; $p < 0.001$
Hypertension	804 (12.9)	63 (18.2)	678 (21.3)	430 (20.5)	102 (18.6)	400 (10.4)	60 (4.8)	χ^2 (4) = 137.98; $p < 0.001$
Asthma	651 (10.4)	40 (11.6)	484 (15.2)	156 (7.4)	42 (7.7)	296 (7.7)	53 (4.3)	χ^2 (4) = 92.58; $p < 0.001$
Arthritis	402 (6.4)	29 (8.4)	246 (7.7)	90 (4.3)	36 (6.6)	139 (3.6)	12 (1.0)	χ^2 (4) = 26.80; $p < 0.001$
Epilepsy	339 (5.4)	26 (7.5)	164 (5.2)	77 (3.7)	17 (3.1)	147 (3.8)	29 (2.4)	χ^2 (4) = 19.02; $p = 0.010$
Cerebrovascular accident	274 (4.4)	20 (5.8)	184 (5.8)	92 (4.4)	25 (4.6)	116 (3.0)	17 (1.4)	χ^2 (4) = 10.60; $p = 0.408$
Eczema	222 (3.6)	7 (2.0)	185 (5.8)	61 (2.9)	17 (3.1)	108 (2.8)	16 (1.3)	χ^2 (4) = 41.93; $p < 0.001$
Migraine	235 (3.8)	12 (3.5)	129 (4.1)	61 (2.9)	17 (3.1)	98 (2.5)	12 (1.0)	χ^2 (4) = 5.44; $p > .99$
Ischemic heart disease	261 (4.2)	13 (3.8)	108 (3.4)	48 (2.3)	19 (3.5)	99 (2.6)	13 (1.0)	χ^2 (4) = 16.74; $p = 0.028$
COPD	271 (4.3)	32 (9.2)	63 (2.0)	21 (1.0)	14 (2.6)	60 (1.6)	15 (1.2)	χ^2 (4) = 114.69; $p < 0.001$
CKD	125 (2.0)	9 (2.6)	56 (1.8)	32 (1.5)	13 (2.4)	37 (1.0)	7 (0.6)	χ^2 (4) = 3.81; $p > .99$
Parkinson's disease	117 (1.9)	6 (1.7)	56 (1.8)	25 (1.2)	11 (2.0)	45 (1.2)	6 (0.5)	χ^2 (4) = 4.56; $p > .99$
Heart failure	88 (1.4)	8 (2.3)	55 (1.7)	29 (1.4)	8 (1.5)	31 (0.8)	3 (0.2)	χ^2 (4) = 3.16; $p > .99$
Psoriasis	103 (1.6)	4 (1.2)	12 (0.4)	6 (0.3)	5 (0.9)	44 (1.1)	5 (0.4)	*
Atrial fibrillation	69 (1.1)	9 (2.6)	23 (0.7)	11 (0.5)	2 (0.4)	15 (0.4)	4 (0.3)	*

TIA	58 (0.9)	7 (2.0)	24 (0.8)	15 (0.7)	7 (1.3)	13 (0.3)	6 (0.5)	*
IBD	24 (0.4)	1 (0.3)	2 (0.1)	2 (0.1)	1 (0.2)	9 (0.2)	1 (0.1)	*
Multiple sclerosis	21 (0.3)	1 (0.3)	3 (0.1)	1 (0.0)	0 (0.0)	4 (0.1)	2 (0.2)	*
Chronic liver disease	9 (0.1)	1 (0.3)	1 (0.0)	6 (0.3)	0 (0.0)	5 (0.1)	0 (0.0)	*
Chronic sinusitis	1 (0.0)	0 (0.0)	3 (0.1)	1 (0.0)	0 (0.0)	1 (0.0)	0 (0.0)	*

[§]Categories were dropped for statistical analysis. * χ^2 test not performed due to small population sizes

Table 4b. Prevalence for each condition across ethnicities in SSD.

	White British n=4008 (30.8%)	Irish n=240 (1.8%)	Black Caribbean n=2799 (21.5%)	Black African n=1886 (14.5%)	South Asian n=421 (3.2%)	Other[§] n=2822 (21.7%)	Unknown[§] n=843 (6.5%)	Statistics
Diabetes	602 (15.0)	37 (15.4)	682 (24.4)	351 (18.6)	87 (20.7)	390 (13.8)	59 (7.0)	χ^2 (4) = 97.10; p <0.001
Hypertension	573 (14.3)	47 (19.6)	606 (21.7)	396 (21.0)	77 (18.3)	322 (11.4)	49 (5.8)	χ^2 (4) = 73.74; p <0.001
Asthma	443 (11.1)	23 (9.6)	408 (14.6)	134 (7.1)	26 (6.2)	217 (7.7)	40 (4.7)	χ^2 (4) = 75.96; p <0.001
Arthritis	252 (6.3)	17 (7.1)	206 (7.4)	86 (4.6)	29 (6.9)	103 (3.6)	9 (1.1)	χ^2 (4) = 15.48; p = 0.038
Epilepsy	261 (6.5)	23 (9.6)	141 (5.0)	70 (3.7)	14 (3.3)	117 (4.1)	26 (3.1)	χ^2 (4) = 32.45; p <0.001
Cerebrovascular accident	188 (4.7)	15 (6.2)	159 (5.7)	82 (4.3)	18 (4.3)	96 (3.4)	15 (1.8)	χ^2 (4) = 6.48; p >0.99
Eczema	145 (3.6)	4 (1.7)	159 (5.7)	54 (2.9)	12 (2.9)	93 (3.3)	12 (1.4)	χ^2 (4) = 33.32; p <0.001
Migraine	126 (3.1)	10 (4.2)	110 (3.9)	48 (2.5)	12 (2.9)	59 (2.1)	7 (0.8)	χ^2 (4) = 8.03; p = 0.904
Ischemic heart disease	187 (4.7)	9 (3.8)	98 (3.5)	46 (2.4)	13 (3.1)	74 (2.6)	8 (0.9)	χ^2 (4) = 19.15; p = 0.007
COPD	190 (4.7)	18 (7.5)	51 (1.8)	16 (0.8)	9 (2.1)	44 (1.6)	14 (1.7)	χ^2 (4) = 101.62; p <0.001
CKD	64 (1.6)	5 (2.1)	45 (1.6)	26 (1.4)	10 (2.4)	24 (0.9)	5 (0.6)	*
Parkinson's disease	79 (2.0)	4 (1.7)	49 (1.8)	21 (1.1)	6 (1.4)	36 (1.3)	6 (0.7)	*

Heart failure	65 (1.6)	8 (3.3)	50 (1.8)	28 (1.5)	7 (1.7)	26 (0.9)	3 (0.4)	*
Psoriasis	66 (1.6)	2 (0.8)	9 (0.3)	6 (0.3)	4 (1.0)	37 (1.3)	5 (0.6)	*
Atrial fibrillation	46 (1.1)	7 (2.9)	22 (0.8)	11 (0.6)	1 (0.2)	10 (0.4)	3 (0.4)	*
TIA	34 (0.8)	5 (2.1)	21 (0.8)	13 (0.7)	6 (1.4)	8 (0.3)	4 (0.5)	*
IBD	12 (0.3)	1 (0.4)	2 (0.1)	2 (0.1)	1 (0.2)	6 (0.2)	1 (0.1)	*
Multiple sclerosis	12 (0.3)	1 (0.4)	3 (0.1)	0 (0.0)	0 (0.0)	2 (0.1)	1 (0.1)	*
Chronic liver disease	7 (0.2)	1 (0.4)	1 (0.0)	6 (0.3)	0 (0.0)	5 (0.2)	0 (0.0)	*
Chronic sinusitis	1 (0.0)	0 (0.0)	3 (0.1)	1 (0.1)	0 (0.0)	1 (0.0)	0 (0.0)	*

[§]Categories were dropped for statistical analysis. * χ^2 test not performed due to small population sizes

Table 4c. Prevalence for each condition across ethnicities in BD.

	White British n=2235 (49.9%)	Irish n=106 (2.4%)	Black Caribbean n=383 (8.5%)	Black African n=208 (4.6%)	South Asian n=128 (2.9%)	Other[§] n=1024 (22.9%)	Unknown[§] n=397 (8.9%)	Statistics
Diabetes	235 (10.5)	18 (17.0)	75 (19.6)	31 (14.9)	38 (29.7)	71 (6.9)	10 (2.5)	χ^2 (4) = 60.65; $p < 0.001$
Hypertension	231 (10.3)	16 (15.1)	72 (18.8)	34 (16.3)	25 (19.5)	78 (7.6)	11 (2.8)	χ^2 (4) = 32.99; $p < 0.001$
Asthma	208 (9.3)	17 (16.0)	76 (19.8)	22 (10.6)	16 (12.5)	79 (7.7)	13 (3.3)	χ^2 (4) = 39.95; $p < 0.001$
Arthritis	150 (6.7)	12 (11.3)	40 (10.4)	4 (1.9)	7 (5.5)	36 (3.5)	3 (0.8)	χ^2 (4) = 19.09; $p = 0.004$
Epilepsy	78 (3.5)	3 (2.8)	23 (6.0)	7 (3.4)	3 (2.3)	30 (2.9)	3 (0.8)	*
Cerebrovascular accident	86 (3.8)	5 (4.7)	25 (6.5)	10 (4.8)	7 (5.5)	20 (2.0)	2 (0.5)	*
Eczema	77 (3.4)	3 (2.8)	26 (6.8)	7 (3.4)	5 (3.9)	15 (1.5)	4 (1.0)	*
Migraine	109 (4.9)	2 (1.9)	19 (5.0)	13 (6.2)	5 (3.9)	39 (3.8)	5 (1.3)	χ^2 (4) = 3.17; $p > 0.99$
Ischemic heart disease	74 (3.3)	4 (3.8)	10 (2.6)	2 (1.0)	6 (4.7)	25 (2.4)	5 (1.3)	*

COPD	81 (3.6)	14 (13.2)	12 (3.1)	5 (2.4)	5 (3.9)	16 (1.6)	1 (0.3)	*
CKD	61 (2.7)	4 (3.8)	11 (2.9)	6 (2.9)	3 (2.3)	13 (1.3)	2 (0.5)	*
Parkinson's disease	38 (1.7)	2 (1.9)	7 (1.8)	4 (1.9)	5 (3.9)	9 (0.9)	0 (0.0)	*
Heart failure	23 (1.0)	0 (0.0)	5 (1.3)	1 (0.5)	1 (0.8)	5 (0.5)	0 (0.0)	*
Psoriasis	37 (1.7)	2 (1.9)	3 (0.8)	0 (0.0)	1 (0.8)	7 (0.7)	0 (0.0)	*
Atrial fibrillation	23 (1.0)	2 (1.9)	1 (0.3)	0 (0.0)	1 (0.8)	5 (0.5)	1 (0.3)	*
TIA	24 (1.1)	2 (1.9)	3 (0.8)	2 (1.0)	1 (0.8)	5 (0.5)	2 (0.5)	*
IBD	12 (0.5)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	3 (0.3)	0 (0.0)	*
Multiple sclerosis	9 (0.4)	0 (0.0)	0 (0.0)	1 (0.5)	0 (0.0)	2 (0.2)	1 (0.3)	*
Chronic liver disease	2 (0.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	*
Chronic sinusitis	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	*

[§]Categories were dropped for statistical analysis. * χ^2 test not performed due to small population sizes

Supplemental Table 5. Social deprivation prevalence for each condition for the whole cohort and within SSD and BD.

	Total cohort						SSD						AD							
	1 - least deprived n (%)	2 n (%)	3 n (%)	4 n (%)	5 - most deprived n (%)	Not stated [§] n (%)	1 - least deprived n (%)	2 n (%)	3 n (%)	4 n (%)	5 - most deprived n (%)	Not stated [§] n (%)	Chi square	1 - least deprived n (%)	2 n (%)	3 n (%)	4 n (%)	5 - most deprived n (%)	Not stated [§] n (%)	Chi square
Total	742 (100)	1384 (100)	3575 (100)	7073 (100)	4033 (100)	693 (100)	412 (100)	887 (100)	2503 (100)	5476 (100)	3204 (100)	537 (100)		330 (100)	497 (100)	1072 (100)	1597 (100)	829 (100)	156 (100)	
Diabetes ***	62 (8.4)	169 (12.2)	528 (14.8)	1201 (17.0)	698 (17.3)	28 (4.0)	49 (11.9)	117 (13.2)	409 (16.3)	1019 (18.6)	594 (18.5)	20 (3.7)	X ² (4) = 29.7; p<0.001	13 (3.9)	52 (10.5)	119 (11.1)	182 (11.4)	104 (12.5)	8 (5.1)	X ² (4) = 19.4; p=0.007
Hypertension ***	77 (10.4)	154 (11.1)	468 (13.1)	1189 (16.8)	627 (15.5)	22 (3.2)	51 (12.4)	108 (12.2)	368 (14.7)	1008 (18.4)	517 (16.1)	18 (3.4)	X ² (4) = 37.8; p<0.001	26 (7.9)	46 (9.3)	100 (9.3)	181 (11.3)	110 (13.3)	4 (2.6)	X ² (4) = 12.3; p=0.17
Asthma ***	42 (5.7)	95 (6.9)	361 (10.1)	758 (10.7)	432 (10.7)	34 (4.9)	27 (6.6)	61 (6.9)	251 (10.0)	589 (10.8)	337 (10.5)	26 (4.8)	X ² (4) = 19.0; p=0.01	15 (4.5)	34 (6.8)	110 (10.3)	169 (10.6)	95 (11.5)	8 (5.1)	X ² (4) = 19.2; p=0.008
Arthritis	36 (4.9)	56 (4.0)	188 (5.3)	411 (5.8)	256 (6.3)	7 (1.0)	18 (4.4)	36 (4.1)	135 (5.4)	312 (5.7)	197 (6.1)	4 (0.7)	X ² (4) = 7.30; p>0.99	18 (5.5)	20 (4.0)	53 (4.9)	99 (6.2)	59 (7.1)	3 (1.9)	X ² (4) = 7.51; p>0.99
Epilepsy	32 (4.3)	50 (3.6)	160 (4.5)	344 (4.9)	202 (5.0)	11 (1.2)	24 (5.8)	40 (4.5)	123 (4.9)	292 (5.3)	164 (5.1)	9 (1.7)	X ² (4) = 1.79; p>0.99	8 (2.4)	10 (2.0)	37 (3.5)	52 (3.3)	38 (4.6)	2 (1.3)	X ² (4) = 7.59; p>0.99
CVA	19 (2.6)	52 (3.8)	146 (4.1)	328 (4.6)	180 (4.5)	3 (0.4)	12 (2.9)	33 (3.7)	107 (4.3)	272 (5.0)	146 (4.6)	3 (0.6)	X ² (4) = 6.55; p>0.99	7 (2.1)	19 (3.8)	39 (3.6)	56 (3.5)	34 (4.1)	0	X ² (4) = 2.80; p>0.99
Eczema	22 (3.0)	45 (3.3)	120 (3.4)	273 (3.9)	147 (3.6)	9 (1.3)	17 (4.1)	34 (3.8)	86 (3.4)	212 (3.9)	123 (3.8)	7 (1.3)	X ² (4) = 1.11; p>0.99	5 (1.5)	11 (2.2)	34 (3.2)	61 (3.8)	24 (2.9)	2 (1.3)	X ² (4) = 6.90; p>0.99
Migraine	17 (2.3)	39 (2.8)	121 (3.4)	243 (3.4)	140 (3.5)	4 (0.6)	11 (2.7)	20 (2.3)	63 (2.5)	176 (3.2)	99 (3.1)	3 (0.6)	X ² (4) = 4.79; p>0.99	6 (1.8)	19 (3.8)	58 (5.4)	67 (4.2)	41 (4.9)	1 (0.6)	X ² (4) = 8.94; p=0.69
Ischaemic heart disease	20 (2.7)	48 (3.5)	103 (2.9)	240 (3.4)	143 (3.5)	7 (1.0)	9 (2.2)	33 (3.7)	74 (3.0)	194 (3.5)	120 (3.7)	5 (0.9)	X ² (4) = 4.99; p>0.99	11 (3.3)	15 (3.0)	29 (2.7)	46 (2.9)	23 (2.8)	2 (1.3)	X ² (4) = 0.43; p>0.99
COPD **	6 (0.8)	35 (2.5)	83 (2.3)	208 (2.9)	139 (3.4)	5 (0.7)	3 (0.7)	22 (2.5)	59 (2.4)	159 (2.9)	95 (3.0)	4 (0.7)	X ² (4) = 9.07; p=0.77	3 (0.9)	13 (2.6)	24 (2.2)	49 (3.1)	44 (5.3)	1 (0.6)	X ² (4) = 21.9; p=0.002

CKD	8 (1.1)	22 (1.6)	46 (1.3)	128 (1.8)	74 (1.8)	1 (0.1)	4 (1.0)	9 (1.0)	28 (1.1)	81 (1.5)	56 (1.7)	1 (0.2)	X ² (4) = 5.83; p>0.99	4 (1.2)	13 (2.6)	18 (1.7)	47 (2.9)	18 (2.2)	0	X ² (4) = 6.76; p>0.99
PD	9 (1.2)	22 (1.6)	51 (1.4)	121 (1.7)	60 (1.5)	3 (0.4)	5 (1.2)	16 (1.8)	33 (1.3)	97 (1.8)	48 (1.5)	2 (0.4)	X ² (4) = 3.13; p>0.99	4 (1.2)	6 (1.2)	18 (1.7)	24 (1.5)	12 (1.4)	1 (0.6)	---
Heart failure	10 (1.3)	12 (0.9)	47 (1.3)	92 (1.3)	58 (1.4)	3 (0.4)	7 (1.7)	10 (1.1)	39 (1.6)	78 (1.4)	52 (1.6)	1 (0.2)	X ² (4) = 1.54; p=0.82	3 (0.9)	2 (0.4)	8 (0.7)	14 (0.9)	6 (0.7)	2 (1.3)	---
Psoriasis	11 (1.5)	12 (0.9)	33 (0.9)	71 (1.0)	48 (1.2)	4 (0.6)	4 (1.0)	6 (0.7)	24 (1.0)	54 (1.0)	37 (1.2)	4 (0.7)	---	7 (2.1)	6 (1.2)	9 (0.8)	17 (1.1)	11 (1.3)	0	---
Atrial fibrillation	10 (1.3)	11 (0.8)	27 (0.8)	53 (0.7)	29 (0.7)	3 (0.4)	6 (1.5)	7 (0.8)	21 (0.8)	42 (0.8)	23 (0.7)	1 (0.2)	---	4 (1.2)	4 (0.8)	6 (0.6)	11 (0.7)	6 (0.7)	2 (1.3)	---
TIA	3 (0.3)	17 (1.0)	27 (0.6)	55 (0.6)	28 (0.5)	0	1 (0.2)	9 (1.0)	16 (0.6)	43 (0.8)	22 (0.7)	0	---	2 (0.6)	8 (1.6)	11 (1.0)	12 (0.8)	6 (0.7)	0	---
IBD	1 (0.1)	4 (0.3)	10 (0.3)	12 (0.2)	13 (0.3)	0	0	1 (0.1)	7 (0.3)	7 (0.1)	10 (0.3)	0	---	1 (0.3)	3 (0.6)	3 (0.3)	5 (0.3)	3 (0.4)	0	---
MS	4 (0.5)	2 (0.1)	7 (0.2)	14 (0.2)	4 (0.1)	1 (0.1)	2 (0.5)	2 (0.2)	2 (0.1)	9 (0.2)	3 (0.1)	1 (0.2)	---	2 (0.6)	0	5 (0.5)	5 (0.3)	1 (0.1)	0	---
Chronic liver disease	0	1 (0.1)	8 (0.2)	8 (0.1)	5 (0.1)	0	0	0	8 (0.3)	8 (0.1)	4 (0.1)	0	---	0	1 (0.2)	0	0	1 (0.1)	0	---
Chronic sinusitis	0	0	1 (0.0)	2 (0.0)	3 (0.1)	0	0	0	1 (0.0)	2 (0.0)	3 (0.1)	0	---	0	0	0	0	0	0	---

*, p<0.05; **, p<0.01; ***, p<0.001; CVA, cerebrovascular accident; COPD, chronic obstructive lung disease; CKD, chronic kidney disease; PD, Parkinson's disease; TIA, transient ischemic attack; IBD, inflammatory bowel disease; MS, multiple sclerosis

Supplemental Table 6. Sociodemographic features of cohort in HoNOS subsample analysis

	Total n (%)	SSD n (%)	BD n (%)
Totals n (%)	13650 (100.0)	10384 (76.1)	3266 (23.9)
Sex***			
Female	6537 (47.9)	4526 (69.2)	2011 (30.8)
Male	7112 (52.1)	5858 (82.4)	1254 (17.6)
Age at first SMI diagnosis***			
15 – 34	5821 (42.6)	4420 (42.6)	1401 (42.9)
35 – 44	3430 (25.1)	2183 (75.3)	716 (24.7)
45 – 54	2082 (15.3)	1594 (76.6)	488 (23.4)
55 – 64	1089 (8.0)	811 (74.5)	278 (25.5)
65+	1759 (12.9)	1376 (13.3)	383 (11.7)
Ethnicity***			
White British	4571 (33.5)	2961 (64.8)	1610 (35.2)
Black Caribbean	2849 (20.9)	2515 (88.3)	334 (11.7)
Black African	1852 (13.6)	1679 (90.7)	173 (9.3)
South Asian	436 (3.2)	338 (77.5)	98 (22.5)
Irish	286 (2.1)	197 (68.9)	89 (31.1)
Other [§]	3127 (22.9)	2327 (74.4)	800 (25.6)
Not stated [§]	529 (3.9)	367 (3.5)	162 (5.0)
Index of multiple deprivation***			
1 (least deprivation)	380 (2.8)	237 (62.4)	143 (37.6)
2	883 (6.5)	581 (65.8)	302 (34.2)
3	2786 (20.4)	1994 (71.6)	792 (28.4)
4	5947 (43.6)	4654 (78.3)	1293 (21.7)
5 (most deprivation)	3308 (24.2)	2650 (80.1)	658 (19.9)
Unknown [§]	346 (2.5)	268 (77.5)	78 (22.5)
Physical conditions***			
No mentions	7232 (53.0)	5320 (73.6)	1912 (26.4)
One	3295 (24.1)	2596 (78.8)	699 (21.2)
Two	1669 (12.2)	1340 (80.3)	329 (19.7)
Three or more	1454 (10.7)	1128 (77.6)	326 (22.4)

Note. *** $p < .001$ for comparisons between BD and SSD groups. [§]Not included in analyses.

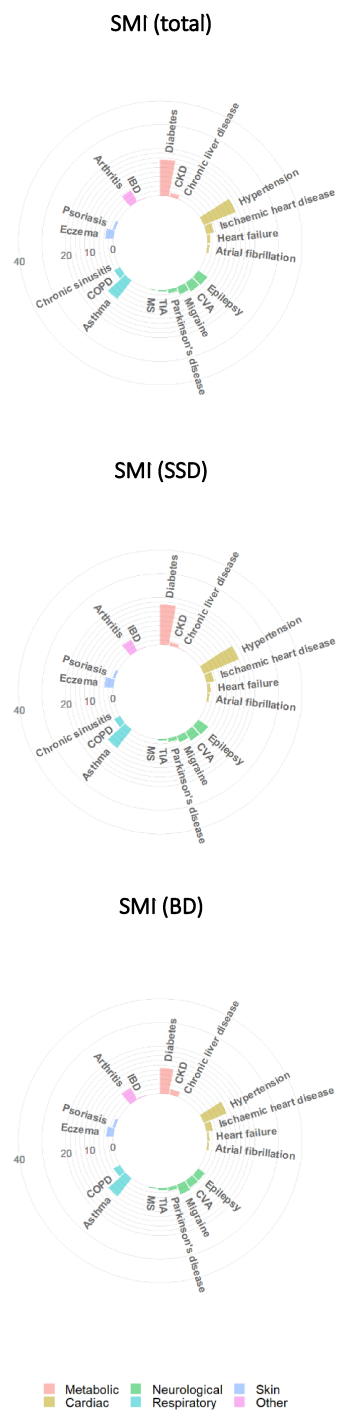
Supplemental Table 7. Associations between comorbidities and HoNOS scores in SSD.

Comorbidity	HoNOS Score	Unadjusted	M1	M2a
	Mean (SD)	B (95% CI)	B (95% CI)	B (95% CI)
Whole cohort	10.75 (6.10)			
Diabetes	11.04 (6.10)	0.360 (0.067 – 0.654)**	0.224 (-0.073 – 0.522)	0.300 (-0.002 – 0.602)
Ref: No diabetes	10.68 (6.10)			
Hypertension	11.17 (6.05)	0.519 (0.220 – 0.818)***	0.264 (-0.048 – 0.575)	0.324 (0.006 – 0.641)*
Ref: No hypertension	10.65 (6.11)			
Asthma	11.19 (6.11)	0.492 (0.126 – 0.859)**	0.551 (0.185 – 0.918)**	0.530 (0.158 – 0.903)**
Ref: No asthma	10.70 (6.10)			
Arthritis	12.08 (6.21)	1.422 (0.948 – 1.895)***	1.259 (0.775 – 1.742)***	1.274 (0.788 – 1.759)***
Ref: No arthritis	10.66 (6.08)			
Epilepsy	11.53 (6.24)	0.827 (0.316 – 1.337)***	0.850 (0.341 – 1.358)***	0.856 (0.341 – 1.370)***
Ref: No epilepsy	10.71 (6.09)			
CVA	11.87 (6.23)	1.178 (0.651 – 1.705)***	0.913 (0.383 – 1.443)***	0.921 (0.388 – 1.454)**
Ref: No CVA	10.69 (6.09)			
Eczema	11.48 (6.25)	0.763 (0.188 – 1.338)**	0.846 (0.273 – 1.420)**	0.754 (0.172 – 1.336)*
Ref: No eczema	10.72 (6.09)			
Migraine	10.71 (5.87)	-0.041 (-0.683 – 0.602)	0.196 (-0.447 – 0.839)	0.192 (-0.458 – 0.842)
Ref: No migraine	10.75 (6.11)			
Ischaemic heart disease	11.59 (5.91)	0.874 (0.274 – 1.474)**	0.520 (-0.083 – 1.124)	0.477 (-0.132 – 1.085)
Ref: No ischaemic heart disease	10.72 (6.11)			
COPD	12.15 (5.70)	1.444 (0.760 – 2.128)***	1.045 (0.354 – 1.736)**	1.043 (0.343 – 1.742)**
Ref: No COPD	10.71 (6.11)			
Number of comorbidities		0.387 (0.294 – 0.481)***	0.328 (0.231 – 0.425)***	0.342 (0.243 – 0.441)***
1 or more comorbidities	11.13 (6.11)	0.745 (0.511 – 0.980)***	0.607 (0.367 – 0.847)***	0.657 (0.410 – 0.903)***
Ref: No comorbidities	10.39 (6.07)			
2 or more comorbidities	11.45 (6.16)	0.921 (0.646 – 1.196)***	0.747 (0.464 – 1.030)***	0.771 (0.484 – 1.059)***
Ref: Less than 1 comorbidities	10.53 (6.07)			

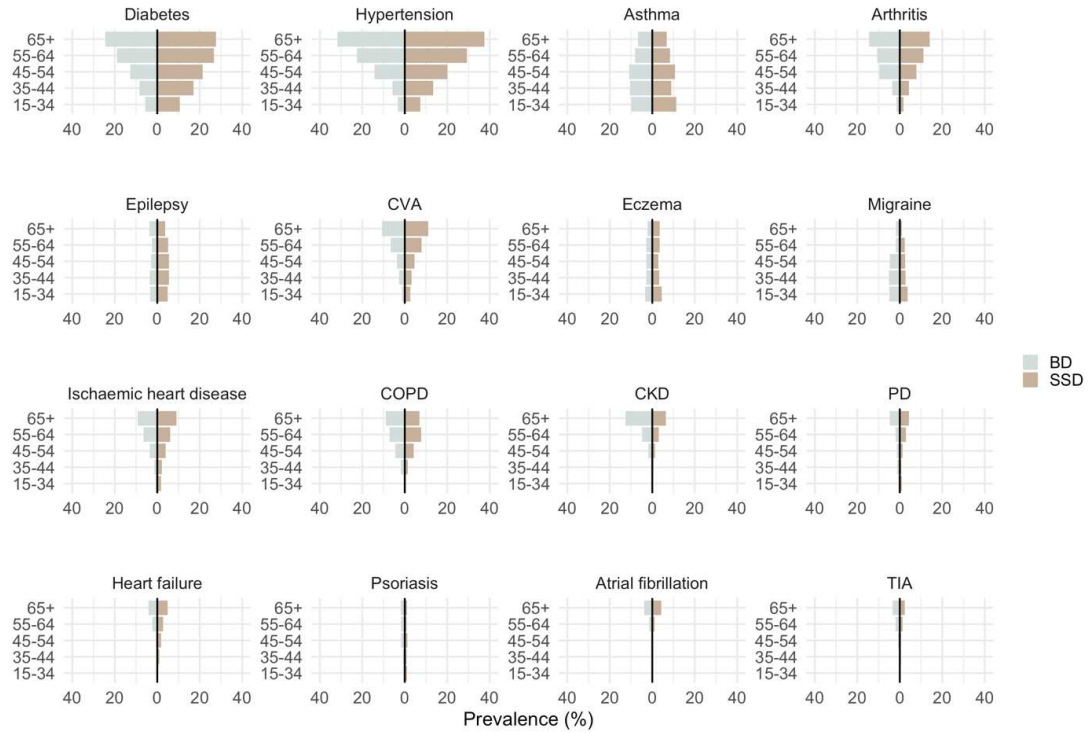
Supplemental Table 8. Associations between comorbidities and HoNOS scores in BD.

Comorbidity	HoNOS Score	Unadjusted	M1	M2a
	Mean (SD)	B (95% CI)	B (95% CI)	B (95% CI)
Whole cohort	9.28 (5.77)			
Diabetes	10.941 (5.97)	1.304 (0.720 – 1.887)***	0.968 (0.370 – 1.565)**	0.961 (0.355 – 1.568)**
Ref: No diabetes	9.11 (5.72)			
Hypertension	10.13 (5.82)	0.972 (0.384 – 1.561)**	0.446 (-0.182 – 1.074)	0.277 (-0.359 – 0.912)
Ref: No hypertension	9.15 (5.76)			
Asthma	10.61 (6.27)	1.512 (0.900 – 2.124)***	1.597 (0.985 – 2.210)***	1.503 (0.887 – 2.120)***
Ref: No asthma	9.10 (5.68)			
Arthritis	11.81 (6.13)	2.725 (1.960 – 3.490)***	2.487 (1.702 – 3.273)***	2.396 (1.606 – 3.186)***
Ref: No arthritis	9.09 (5.70)			
Epilepsy	10.77 (5.96)	1.552 (0.513 – 2.591)**	1.587 (0.551 – 2.624)**	1.496 (0.466 – 2.527)**
Ref: No epilepsy	9.22 (5.76)			
CVA	11.60 (6.16)	2.425 (1.464 – 3.386)***	2.098 (1.124 – 3.071)***	2.030 (1.064 – 2.996)***
Ref: No CVA	9.17 (5.73)			
Eczema	9.83 (5.82)	0.578 (-0.446 – 1.603)	0.622 (-0.400 – 1.644)	0.427 (-0.603 – 1.458)
Ref: No eczema	9.26 (5.77)			
Migraine	9.55 (5.34)	0.284 (-0.586 – 1.154)	0.523 (-0.350 – 1.397)	0.527 (-0.346 – 1.400)
Ref: No migraine	9.26 (5.80)			
Ischaemic heart disease	11.84 (5.95)	2.649 (1.560 – 3.738)***	2.093 (0.987 – 3.200)***	2.204 (1.098 – 3.309)**
Ref: No ischaemic heart disease	9.19 (5.75)			
COPD	11.89 (5.99)	2.711 (1.679 – 3.743)***	2.298 (1.248 – 3.348)***	2.128 (1.077 – 3.179)***
Ref: No COPD	9.18 (5.74)			
Number of comorbidities		0.723 (0.566 – 0.879)***	0.661 (0.494 – 0.828)***	0.642 (0.473 – 0.811)***
1 or more comorbidities	10.30 (5.91)	1.740 (1.343 – 2.138)***	1.559 (1.143 – 1.974)***	1.457 (1.031 – 1.883)***
Ref: No comorbidities	8.56 (5.57)			
2 or more comorbidities	10.89 (5.99)	2.013 (1.524 – 2.503)***	1.797 (1.280 – 2.314)***	1.789 (1.267 – 2.311)***
Ref: Less than 1 comorbidities	8.88 (5.64)			

Supplemental Figure 1. Distribution of all conditions in the SMI cohort by SMI diagnoses



Supplemental Figure 2. Prevalence rates for age at SMI diagnoses per condition and comparison between individuals with BD and SSD.



Appendix 1. SNOMED Container and Concept Level Groupings for physical health conditions included in this study.

Container Concept	Concepts
S-73211009 - Diabetes mellitus (disorder)	S-44054006 - Diabetes mellitus type 2 (disorder) S-46635009 - Diabetes mellitus type 1 (disorder) S-422088007 - Disorder of nervous system co-occurrent and due to diabetes mellitus (disorder) S-25093002 - Disorder of eye co-occurrent and due to diabetes mellitus (disorder) S-73211009 - Diabetes mellitus (disorder)
S-84114007 - Heart failure (disorder)	S-128404006 - Right heart failure (disorder) S-48447003 - Chronic heart failure (disorder) S-56675007 - Acute heart failure (disorder) S-85232009 - Left heart failure (disorder) S-42343007 - Congestive heart failure (disorder) S-84114007 - Heart failure (disorder)
S-414545008 - Ischemic heart disease (disorder)	S-413439005 - Acute ischemic heart disease (disorder) S-413838009 - Chronic ischemic heart disease (disorder) S-194828000 - Angina (disorder) S-22298006 - Myocardial infarction (disorder) S-414545008 - Ischemic heart disease (disorder)
S-38341003 - Hypertensive disorder, systemic arterial (disorder)	S-31992008 - Secondary hypertension (disorder) S-48146000 - Diastolic hypertension (disorder) S-56218007 - Systolic hypertension (disorder) S-59621000 - Essential hypertension (disorder) S-38341003 - Hypertensive disorder, systemic arterial (disorder)
S-13645005 - Chronic obstructive lung disease (disorder)	S-195951007 - Acute exacerbation of chronic obstructive airways disease (disorder) S-87433001 - Pulmonary emphysema (disorder) S-13645005 - Chronic obstructive lung disease (disorder)
S-195967001 - Asthma (disorder)	S-195967001 - Asthma (disorder)
S-709044004 - Chronic kidney disease (disorder)	S-723190009 - Chronic renal insufficiency (disorder) S-709044004 - Chronic kidney disease (disorder)

S-230690007 - Cerebrovascular accident (disorder)	S-25133001 - Completed stroke (disorder) S-371040005 - Thrombotic stroke (disorder) S-371041009 - Embolic stroke (disorder) S-413102000 - Infarction of basal ganglia (disorder) S-422504002 - Ischemic stroke (disorder) S-723082006 - Silent cerebral infarct (disorder) S-1078001000000105 - Haemorrhagic stroke (disorder) S-230690007 - Cerebrovascular accident (disorder)
S-266257000 - Transient ischemic attack (disorder)	S-266257000 - Transient ischemic attack (disorder)
S-49049000 - Parkinson's disease (disorder)	S-49049000 - Parkinson's disease (disorder)
S-24700007 - Multiple sclerosis (disorder)	S-24700007 - Multiple sclerosis (disorder)
S-84757009 - Epilepsy (disorder)	S-352818000 - Tonic-clonic epilepsy (disorder) S-19598007 - Generalized epilepsy (disorder) S-230456007 - Status epilepticus (disorder) S-509341000000107 - Petit-mal epilepsy (disorder) S-84757009 - Epilepsy (disorder)
S-37796009 - Migraine (disorder)	S-37796009 - Migraine (disorder) S-4473006 - Migraine with aura (disorder) S-56097005 - Migraine without aura (disorder)
S-53741008 - Coronary arteriosclerosis (disorder)	S-810681000000101 - Coronary microvascular disease (disorder) S-53741008 - Coronary arteriosclerosis (disorder)
S-49436004 - Atrial fibrillation (disorder)	S-49436004 - Atrial fibrillation (disorder)
S-40055000 - Chronic sinusitis (disorder)	S-40055000 - Chronic sinusitis (disorder)
S-24526004 - Inflammatory bowel disease (disorder)	S-24526004 - Inflammatory bowel disease (disorder) S-397173003 - Crohn's disease of intestine (disorder) S-64766004 - Ulcerative colitis (disorder)
S-328383001 - Chronic liver disease (disorder)	S-328383001 - Chronic liver disease (disorder) S-76783007 - Chronic hepatitis (disorder) S-79720007 - Chronic nonalcoholic liver disease (disorder)

	S-713181003 - Chronic alcoholic liver disease (disorder)
S-9014002 - Psoriasis (disorder)	S-9014002 - Psoriasis (disorder)
S-43116000 - Eczema (disorder)	S-43116000 - Eczema (disorder)
S-3723001 - Arthritis (disorder)	S-69896004 - Rheumatoid arthritis (disorder) S-399112009 - Seronegative arthritis (disorder) S-35908007 - Chronic arthritis (disorder) S-11939005 - Acute arthritis (disorder) S-3723001 - Arthritis (disorder)