

Appendix A1

We categorized behavioral health ICD-9-CM diagnosis codes into eleven mutually exclusive categories: Adjustment, Affective, Anxiety, Axis II, Eating, Neuropsychiatric, Psychosis, Sleep, Substance Abuse, Other and Unknown. Here, we list the ICD-9-CM diagnosis codes used to determine if a patient met the criteria for each of the eleven behavioral health conditions.

Adjustment: 308, 308.2, 308.3, 308.4, 308.9, 309, 309.1, 309.24, 309.28, 309.29, 309.3, 309.4, 309.83, 309.89, 309.9

Affective: 296, 296.03, 296.04, 296.05, 296.1, 296.11, 296.2, 296.21, 296.22, 296.23, 296.24, 296.3, 296.31, 296.32, 296.33, 296.34, 296.35, 296.4, 296.42, 296.43, 296.53, 296.6, 296.61, 296.7, 296.8, 296.9, 300.4, 300.5, 311, E939.0

Anxiety: 300, 300.01, 300.02, 300.09, 300.2, 300.29, 300.3, 309.21, 309.81, 799.21

Axis II: 300.1, 300.11, 300.14, 300.15, 300.19, 301, 301.12, 301.2, 301.3, 301.4, 301.6, 301.7, 301.81, 301.83, 301.89, 301.9

Eating: 307.1, 307.5, 307.51, 307.59

Neuropsychiatric: 290.1, 290.11, 290.12, 290.13, 290.2, 290.21, 290.3, 290.4, 290.41, 290.42, 290.43, 292.81, 293, 293.1, 293.83, 293.84, 293.89, 293.9, 294, 294.1, 294.11, 294.8, 294.9, 299, 308.1, 310, 310.1, 310.2, 310.8, 310.9, 314, 314.01, 315.1, 315.31, 315.8, 315.9, 317, 319, 327.2, 327.23, 327.24, 331, 331.19, 331.82, 331.83, 331.9, V40.0

Psychosis: 290.9, 293.81, 295, 295.01, 295.1, 295.11, 295.2, 295.3, 295.31, 295.33, 295.6, 295.61, 295.62, 295.64, 295.7, 295.72, 295.74, 295.9, 295.91, 297.1, 297.8, 297.9, 298.3, 298.4, 298.8, 298.9, 299.1, 299.8, 780.1

Sleep: 307.4, 307.41, 307.42, 307.43, 307.46, 307.47, 307.49, 327, 327.01, 327.02, 327.3, 327.31, 327.42, 327.51, 327.52, 327.53, 780.5, 780.51, 780.52, 780.53, 780.54, 780.57, 780.59

Substance Abuse: 291, 291.1, 291.2, 291.81, 291.89, 291.9, 292, 292.11, 292.12, 292.2, 292.84, 293.82, 303, 303.01, 303.02, 303.9, 303.91, 303.93, 304, 304.01, 304.1, 304.11, 304.2, 304.5, 304.6, 304.7, 304.8, 304.83, 304.9, 304.93, 305, 305.01, 305.02, 305.03, 305.1, 305.5, 535.3, 571.1, 571.2, 571.3, 965, 965.02, 965.09, E854.2, E935.0, E935.1, V11.3

Other: 300.7, 300.81, 300.82, 300.9, 302.7, 302.71, 302.72, 302.74, 302.79, 302.83, 302.9, 306.5, 306.9, 307.8, 307.89, 312, 312.3, 312.89, 312.9, 316, 368.16, 799.25, 967.8, 970.8, E939.2, E939.3, E939.8, V65.2

Unknown: 292.9, 298.2, 306.1, 306.8, 783.7, 799.29, 969, 969.4, 980, 995.81, 995.83, 995.84, E950.0, E950.4, E953.0, E956, E958.9, E959, E987.2, V11.8, V40.3, V62.84, V62.9, V66.3, V69.2, V70.2, V71.9

Appendix A2

We categorized psychotropic medications into seven mutually exclusive categories: Anxiety, Cognitive, Mood, Psychosis, Sleep and Substance Abuse. Here, we list the generic drug names followed by brand name in parentheses for each category.

Anxiety

Alprazolam (Xanax)
Buspirone (Buspar)
Chlordiazepoxide (Librium)
Clonazepam (Klonopin)
Clonidine (Catapres)
Clorazepate (Tranxene)
Diazepam (Valium)
Gabapentin (Neurontin)
Lorazepam (Ativan)
Meprobamate (Equanil)
Oxazepam (Serax)
Propranolol (Inderal)

Cognitive

Amantadine (Symmetrel)
Amphetamine and Dextroamphetamine (Adderall)
Armodafinil (Nuvigil)
Atomoxetine (Strattera)
Dexmethylphenidate (Focalin)
Dextroamphetamine (Dexedrine)
Donepezil (Aricept)
Methylphenidate (Ritalin)
Modafinil (Provigil)

Mood

Amitriptyline (Elavil)
Amitriptyline and Perphenazine (Triavil)
Bupropion (Wellbutrin, Zyban)
Carbamazepine (Tegretol)
Citalopram (Celexa)
Clomipramine (Anafranil)
Desipramine (Norpramin)
Divalproex, Valproic Acid (Depakote)
Doxepin (Sinequan)
Duloxetine (Cymbalta)
Escitalopram (Lexapro)
Fluoxetine (Prozac)

Fluvoxamine (Luvox)
Imipramine (Tofranil)
Lamotrigine (Lamictal)
Lithium (Eskalith)
L-methylfolate (Deplin)
Mirtazapine (Remeron)
Nefazodone (Serzone)
Nortriptyline (Pamelor)
Oxcarbazepine (Trileptal)
Paroxetine (Paxil)
Phenelzine (Nardil)
Protriptyline (Vivactil)
Selegiline (Emsam)
Sertraline (Zoloft)
Tranlycypromine (Parnate)
Trazodone (Desyrel)
Venlafaxine (Effexor)
Zonisamide (Zonegran)

Psychosis

Aripiprazole (Abilify)
Benztropine (Cogentin)
Chlorpromazine (Thorazine)
Clozapine (Clozaril)
Fluphenazine (Prolixin)
Haloperidol (Haldol)
Loxapine (Loxitane)
Molindone (Moban)
Olanzapine (Zydis, Zyprexa)
Paliperidone (Invega)
Perphenazine (Trilafon)
Prochlorperazine (Compazine)
Quetiapine (Seroquel)
Risperidone (Risperdal)
Thioridazine (Mellaril)
Thiothixene (Navane)
Trifluoperazine (Trifluoperaz)
Trihexyphenidyl (Artane)
Ziprasidone (Geodon)

Sleep

Chloral Hydrate (Aquachloral)
Estazolam (Prosom)
Eszopiclone (Lunesta)

Flurazepam (Dalmane)
Melatonin (Melatonin)
Ramelteon (Rozerem)
Temazepam (Restoril)
Triazolam (Halcion)
Zaleplon (Sonata)
Zolpidem (Ambien)

Substance Abuse

Acamprosate (Campral)
Buprenorphine (Suboxone)
Disulfiram (Antabuse)
Methadone (Dolophine)
Naloxone (Narcan)
Naltrexone (Revia)
Varenicline (Chantix)

Appendix Exhibit A3. Type 3 Analysis of Effects, any ED visit

Effect	DF	Wald ChiSq	Pr > ChiSq
Male	1	1.83	.176
Age group	4	3.29	.511
Post-study survival	5	69.71	<.001
Hierarchical Condition Category (HCC) Group	3	23.21	<.001
Year of enrollment	3	1.98	.576
Number of current psychiatric medication categories	2	53.79	<.001
Number of current psychiatric diagnosis categories	2	38.80	<.001

Appendix Exhibit A4. Analysis of Variance Maximum Likelihood Estimates Logistic: any ED visit

Parameter	Estimate	Standard Error	Wald ChiSq	P>ChiSq
Intercept	-1.689	.182		<.001
Male	-.099	.073	1.83	.176
Age group, years				
60s	.024	.153	.02	.877
70s	-.080	.139	.34	.562
80s	-.108	.142	.58	.446
90+	.124	.198	.39	.532
Post-study survival, months				
0 (death during last month of enrollment)	1.398	.431	10.51	.001
1-3	1.291	.243	28.28	<.001
4-12	.863	.146	6.33	.012
13-24	.373	.148	7.05	.008
25-44	.341	.128	34.95	<.001
Hierarchical Condition Category (HCC) Group				
[2.3,2.7)	.140	.104	1.80	.179
[2.7,3.4)	.212	.103	4.23	.040
[3.4,12.7)	.472	.101	21.67	<.001
Year of enrollment				
2008	-.383	.339	1.27	.259
2009	.010	.101	.01	.919
2010	.086	.112	0.60	.439
Number of current psychiatric medication categories				
1	.459	.121	14.31	<.001
≥2	.795	.111	51.19	<.001
Number of current psychiatric diagnosis categories				
1	.191	.101	3.58	.059
≥2	.559	.095	35.00	<.001

Appendix Exhibit A5. Type 3 Analysis of Effects, count of ED visits

Source	DF	ChiSq	Pr > ChiSq
Male	1	.34	.560
Age group, years	4	6.31	.177
Post-study survival, months	5	27.54	<.001
Hierarchical Condition Category (HCC) Group	3	1.79	.618
Year of enrollment	3	3.34	.342
Number of current psychiatric medication categories	2	17.56	<.001
Number of current psychiatric diagnosis categories	2	16.61	<.001

Appendix Exhibit A6. Analysis of Variance Maximum Likelihood Estimates, count of ED visits

Parameter	Estimate	Standard Error	Wald ChiSq	Pr > ChiSq
Intercept	.311	.107	8.47	.004
Male	.024	.041	.34	.560
Age group, years				
60s	-.103	.078	1.78	.182
70s	-.173	.071	5.95	.015
80s	-.128	.072	3.17	.075
90+	-.172	.100	2.94	.086
Post-study survival, months				
0 (death during last month of enrollment)	.085	.186	.21	.648
1-3	.384	.089	18.78	<.001
4-12	.249	.067	1.48	.224
13-24	.094	.077	.16	.690
25-44	.028	.070	14.02	<.001
Hierarchical Condition Category (HCC) Group				
[2.3,2.7)	.026	.061	.19	.667
[2.7,3.4)	-.024	.061	.15	.697
[3.4,12.7)	.044	.057	.61	.437
Year of enrollment				
2008	-.209	.231	.82	.367
2009	.075	.055	1.88	.171
2010	.061	.063	.92	.337
Number of current psychiatric medication categories				
1	.173	.083	4.34	.037
≥2	.290	.075	14.84	<.001
Number of current psychiatric diagnosis categories				
1	.078	.063	1.52	.217
≥2	.210	.057	13.75	<.001

Appendix Exhibit A7. Type 3 Analysis of Effects, any ED visit

Effect	DF	Wald Chi-Sq	Pr > ChiSq
Male	1	2.51	.113
Age group	4	3.26	.515
Post-study survival	5	63.84	<.001
Hierarchical Condition Category (HCC) Group	3	20.12	<.001
Year of enrollment	3	2.57	.463
Number of current psychiatric medication categories	2	53.85	<.001
Adjustment	1	5.46	.019
Affective	1	.07	.794
Anxiety	1	1.81	.179
Axis II	1	1.22	.270
Eating	1	.01	.925
Neuropsychiatric	1	4.60	.032
Other	1	2.29	.131
Psychosis	1	9.55	.002
Sleep	1	4.61	.032
Substance Abuse	1	2.69	.101
Unknown	1	20.70	<.001

Appendix Exhibit A8. Analysis of Variance Maximum Likelihood Estimates, any ED visit

Parameter	Estimate	Standard Error	Wald ChiSq	P>ChiSq
Intercept	-1.698	.182	86.93	<.001
Male	-.117	.074	2.51	.113
Age group, years				
60s	.101	.157	.42	.519
70s	-.016	.144	.01	.914
80s	-.062	.148	.18	.676
90+	.150	.203	.54	.461
Post-study survival, months				
0 (death during last month of enrollment)	1.387	.433	10.27	.001
1-3	1.273	.244	27.13	<.001
4-12	.828	.147	4.97	.026
13-24	.335	.150	5.06	.024
25-44	.294	.131	31.64	<.001
Hierarchical Condition Category (HCC) Group				
[2.3,2.7)	.128	.105	1.49	.223
[2.7,3.4)	.199	.104	3.68	.055
[3.4,12.7)	.442	.102	18.71	<.001
Year of enrollment				
2008	-.469	.345	1.84	.175
2009	.011	.102	.01	.916

2010	.087	.113	.59	.441
Number of current psychiatric medication categories				
1	.468	.121	14.98	<.001
≥2	.798	.111	51.85	<.001
Current psychiatric diagnosis categories				
Adjustment	.236	.101	5.46	.019
Affective	.024	.094	.07	.794
Anxiety	-.135	.101	1.81	.179
Axis II	.302	.274	1.22	.270
Eating	.042	.445	.01	.925
Neuropsychiatric	.172	.080	4.60	.032
Other	.261	.173	2.29	.131
Psychosis	.349	.113	9.55	.002
Sleep	.200	.093	4.61	.032
Substance Abuse	.198	.121	2.69	.101
Unknown	.415	.091	20.70	<.001

Appendix Exhibit A9. Type 3 Analysis of Effects, any ED visit

Source	DF	Chi-Square	Pr > ChiSq
Male	1	.16	.686
Age group	4	4.05	.399
Post-study survival	5	26.41	<.001
Hierarchical Condition Category (HCC) Group	3	1.90	.594
Year of enrollment	3	3.72	.293
Number of current psychiatric medication categories	2	16.78	<.001
Adjustment	1	.01	.937
Affective	1	.01	.926
Anxiety	1	.30	.581
Axis II	1	4.73	.030
Eating	1	2.20	.138
Neuropsychiatric	1	6.63	.010
Other	1	8.50	.004
Psychosis	1	.18	.671
Sleep	1	.28	.599
Substance Abuse	1	11.96	.001
Unknown	1	2.94	.086

Appendix Exhibit A10. Analysis of Variance Maximum Likelihood Estimates, count of ED visits

Parameter	Estimate	Standard Error	Wald ChiSq	Pr > ChiSq
Intercept	.286	.105		
Male	.017	.041	.16	.686
Age group, years				
60s	-.061	.079	.59	.444
70s	-.133	.073	3.32	.068
80s	-.073	.074	.96	.327
90+	-.104	.103	1.02	.313
Post-study survival, months				
0 (death during last month of enrollment)	.092	.187	.24	.622
1-3	.382	.089	18.3	<.001
4-12	.234	.067	1.44	.230
13-24	.094	.078	.01	.942
25-44	.005	.071	12.21	<.001
Hierarchical Condition Category (HCC) Group				
[2.3,2.7)	.021	.061	.12	.730
[2.7,3.4)	-.033	.061	.30	.583
[3.4,12.7)	.038	.057	.45	.503
Year of enrollment				
2008	-.235	.232	1.03	.310

2009	.085	.056	2.35	.125
2010	.040	.064	.40	.530
Number of current psychiatric medication categories				
1	.183	.083	4.89	.027
≥2	.288	.075	14.74	<.001
Current psychiatric diagnosis categories				
Adjustment	.004	.052	.01	.937
Affective	-.005	.048	.01	.926
Anxiety	.029	.052	.31	.580
Axis II	.244	.109	5.03	.025
Eating	-.344	.244	1.99	.159
Neuropsychiatric	.108	.042	6.65	.010
Other	.228	.076	8.98	.003
Psychosis	.023	.054	.18	.670
Sleep	.025	.048	.28	.598
Substance Abuse	.204	.058	12.48	<.001
Unknown	.077	.045	2.96	.085