**Appendix**

**Chronic Conditions ICD-9 Codes**

Cirrhosis: 571.2, 571.5, 456.0, 572.4, 567.23, 572.2

Chronic hepatitis C: 070.44, 070.54, 070.70, 070.71, V02.62

Congestive heart failure: Primary diagnosis of 402.01, 402.11, 402.91, 404.01, 404.03, 404.11, 404.13, 404.91, 404.93, 428.0, 428.1, 428.20, 428.21, 428.22, 428.23, 428.30, 428.31, 428.32, 428.33, 428.40, 428.41, 428.42, 428.43, 428.9

Chronic obstructive pulmonary disease: Either a primary diagnosis of 491.21, 491.22, 491.8, 491.9, 492.8, 493.2, 493.21, 493.22, 496 or a primary diagnosis of 518.81, 518.82, 518.84, 799.1 with a secondary code of 491.21, 491.22, 493.21, 493.22

**Mental Health Conditions ICD-9 Codes**

Depression: 293.3, 296.2, 298\*, 309.00, 309.1, 311\*

Anxiety: 293.84, 300\*

Other: 293.0, 293.1, 293.81, 293.82, 293.83, 293.89, 293.9, 295\*, 296.0, 296.1, 296.4, 296.5, 296.6, 296.7, 296.8, 296.9, 297\*, 298\* 299\*, 301\*, 302\*, 307\*, 308\*, 309.2, 309.3, 309.4, 309.8, 309.9, 310\*, 312\*, 316\*, 317\*, 318\*, 319\*

**Substance Abuse ICD-9 Codes**

Alcohol Abuse: 291\*,303\*, 305.0', 305.01, '305.02, 305.03

Drug Abuse: 292\*, 304\*, 305.2, 305.3, 305.4, 305.5, 305.6, 305.7, 305.8, 305.9

**Opioid Prescription Identification:**

A text string search was used to pull in opioids under the therapeutic drug class of’ Analg/Antipyr, Opiate Agonists’ or ‘Analy/Antipyr,OpiatePart Agnst’

or opioids with a generic name of ‘Buprenorphine’, ‘Buprenorphine Hydrochloride’, or ‘Tramadol’

**Benzodiazepine Prescription Indentification:**

A text string search was used to pull in benzodiazepines under the generic drug names of:

Alprazolam, Bromazepam, Clobazam, Clonazepam, Clorazepate Dipotassium, Diazepam, Estazolam, Flurazepam HCL, Halazepam, Lorazepam, Midazolam, Midazolam HCL, Oxazepam, Quazepam, Temazepam, Triazolam

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Supplement TABLE 1. Prevalence of Opioid & Benzodiazepine Use by Chronic Disease for Patients Less than 65 Years of Age** | | | | |  |
| **Category** | **Cirrhosis** | **Hepatitis C without cirrhosis** | **CHF** | **COPD** | **P- Value** |
| **All:** |  |  |  |  |  |
| Number of Patients | 147,258 | 201,625 | 384,824 | 959,617 |  |
| Person-years | 241,812 | 371,890 | 817,754 | 2,168,959 |  |
| **Opioids:** |  |  |  |  |  |
| Number of Patients using Opioids (2009-2015) | 93,805 | 108,312 | 241,749 | 604,385 |  |
| Prevalence of Opioid Use per 100 person-years (95% CI) | 38.8 | 29.1 | 29.6 | 27.9 |  |
| (38.6, 39.0) | (29.0, 29.3) | (29.5, 29.7) | (27.8, 27.9) | <0.001 |
| **Benzodiazepine:** |  |  |  |  |  |
| Number of Patients using Benzodiazepine (2009-2015) | 54,396 | 54,044 | 107,351 | 319,123 |  |
| Prevalence of Benzodiazepine per 100 person-years (95% CI) | 22.5 | 14.5 | 13.1 | 14.7 |  |
| (22.3, 22.7) | (14.4, 14.6) | (13.1, 13.2) | (14.7, 14.8) | <0.001 |
| **Both Opioids and Benzodiazepines:** | | |  |  |  |
| Number of Patients using both Opioids & Benzodiazepine (2009-2015) | 44,908 | 42,542 | 89,755 | 266,660 |  |
| Prevalence of both Opioid & Benzodiazepine per 100 person-years (95% CI) | 18.6 | 11.4 | 11.0 | 12.3 |  |
| (18.4, 18.7) | (11.3, 11.5) | (10.9, 11.0) | (12.3, 12.3) | <0.001 |