Online Supplement:

Appendix A: Coding of Behavioral Health Conditions Using ICD-9 Codes

Visit Diagnosis	ICD-9 Codes
Psychoses	293.81, 293.82, 294.2-294.9, 295.x, 296.8, 296.9, 297.x, and 298.x,
Substance Use Disorders	
Opioid use disorder	304.0, 304.7, and 305.5
Substance Use Disorder excluding opioid use disorder and tobacco	291.x, 292.x, 303.x, 304.1-304.6, 304.8-304.9, 305.0; 305.2-305.4, 305.6-305.9
Depression	296.2, 296.3, 300.4, 311.x
All other behavioral health	All remaining diagnoses between 290.x and 319.x not classified in the above categories
Non behavioral health diagnosis	All other ICD-9 codes

Note: Categories are mutually exclusive. A hierarchical classification is used in the order

presented in the table.

Source: Adapted from Golberstein et al. (2015) and Manhapra et al. (2018)

Appendix B: Supplemental Tables

Supplemental Table 1: Descriptive Statistics for Included Visits to Primary Care Physicians (2011-2015)

Mean (standard error) or %	Overall	Visit Results in a Referral		
		No	Yes	
	(N=577,719,897; n=20,313)	(N=480,977,196; n=17,151)	(N=96,742,701; n=3,162)	
Referral to other physician	16.7	0	100	*
Primary behavioral health diagnosis	3.5	3.3	4.4	*
Depression	1.2	1.1	1.8	*
Psychoses	0.3	0.2	0.7	
Substance Use Disorder (excluding opioid use disorder)	0.1	0.0	0.2	
Opioid Use Disorder	0.1	0.1	0.1	
All other behavioral health diagnoses	1.8	1.9	1.7	
Major reason for visit				
New problem (<3 mo onset)	82.3	84.2	72.6	*
Chronic problem, flare-up	17.7	15.8	27.4	
Number of diagnoses for visit record	2.3 (0.04)	2.2 (0.04)	2.5 (0.06)	*
Patient characteristics				
Patient is female	59.9	59.8	60.0	
Patient age in years	53.7	53.5	54.7	
Patient race / ethnicity				
Non-Hispanic White	69.2	69.6	67.2	
Non-Hispanic Black	10.9	10.7	12.2	
Hispanic	14.0	13.7	15.4	
Non-Hispanic Other	5.9	6.1	5.2	
Expected source of payment				*
Private Insurance	55.2	55.1	55.9	
Medicare	29.3	29.4	28.7	
Medicaid	8.4	8.1	10.1	
Other - worker's comp, self-pay, no charge, and other	7.1	7.4	5.3	
Patient comorbidities				
Arthritis	17.3	16.0	23.6	*
Asthma	7.5	7.2	9.0	
Cancer	4.0	3.9	4.5	
Chronic renal failure	3.8	3.3	6.3	*
Coronary artery disease / Ischemic Heart Disease	4.8	4.4	6.8	*
Diabetes	15.4	15.0	17.5	
Cerebrovascular disease	2.1	1.9	3.3	
Congestive Heart Failure	2.5	2.4	3.3	
Chronic Obstructive Pulmonary Disease	6.9	7.0	6.3	
Hyperlipidemia	27.0	26.1	31.4	*
Hypertension	36.8	36.8	36.4	
Obesity	10.7	10.3	13.0	*
Osteoporosis	4.1	3.8	5.9	*

Note: * indicates difference significant at p<0.05. Statistical significance based on t-tests and chi-squared for categorical variables. Linearized standard errors in parentheses for continuous variables, accounting for sample design.