

<b>Table S1.</b> Psychiatric diagnoses and corresponding ICD-9, ICD-10 diagnostic codes		
<b>Psychiatric Disorders</b>	<b>ICD-9 Code</b>	<b>ICD-10 Code</b>
Depressive Disorders	296.20-296.25, 296.30-296.35, 296.82, 296.90, 300.4, 301.12, 311.	F32.0-F32.4, F32.8X, F32.9, F32.A, F33.0-F33.3, F33.41, F33.8, F33.9, F34.1, F34.8X, F34.9, F39.
Anxiety disorders	300.0X, 300.2X	F40.X, F41.X
Posttraumatic Stress Disorder	309.81	F43.10, F43.12
Bipolar Disorder	296.00-296.05, 296.10-296.15, 296.40-296.45, 296.50-296.55, 296.60-296.65, 296.7, 296.80, 296.81, 296.89, 301.13	F30.1X-F30.3, F30.8, F30.9, F34.0
Psychotic Spectrum Disorder	295.00-295.04, 295.10-295.14, 295.20-295.24, 295.30-295.34, 295.40-295.44, 295.60-295.64, 295.70-295.74, 295.80-295.84, 295.90-295.94, 297.X, 298.X	F20.0-F20.5, F20.81, F20.9, F21.-F25.X, F28., F29.

**Table S2a.** Adjusted Prevalences of Psychiatric Disorders in VA Patients, 2005 and 2019, overall and by age group

	<b>2005</b>		<b>2019</b>	
	n	(%)	n	(%)
<b>All ages 18 years and older</b>	<b>N=4,332,165</b>		<b>N=5,657,277</b>	
Any psychiatric disorder <sup>a</sup>	824,019	(19.02)	1,652,604	(29.21)
Depressive disorders	452,950	(10.46)	912,804	(16.14)
Anxiety disorders	162,551	(3.75)	574,621	(10.16)
PTSD	267,671	(6.18)	839,439	(14.84)
Bipolar disorders	72,681	(1.68)	128,146	(2.27)
Psychotic-spectrum disorders	117,671	(2.72)	99,132	(1.75)
<b>&lt;35 years</b>	<b>n=187,692</b>		<b>n=482,749</b>	
Any psychiatric disorder <sup>a</sup>	37,912	(20.20)	203,386	(42.13)

Depressive disorders	20,571	(10.96)	108,160	(22.41)
Anxiety disorders	8,367	(4.46)	87,510	(18.13)
PTSD	12,817	(6.83)	108,788	(22.54)
Bipolar disorders	4,957	(2.64)	16,278	(3.37)
Psychotic-spectrum disorders	3,614	(1.93)	8,712	(1.80)
<b>35-64 years</b>	<b>n=2,015,250</b>		<b>n=2,235,902</b>	
Any psychiatric disorder	566,190	(28.10)	838,489	(37.50)
Depressive disorders	305,977	(15.18)	472,542	(21.13)
Anxiety disorders	100,288	(4.98)	307,313	(13.74)
PTSD	218,010	(10.82)	427,606	(19.12)
Bipolar disorders	57,133	(2.84)	80,187	(3.59)
Psychotic-spectrum disorders	77,764	(3.86)	53,249	(2.38)
<b>≥65 years</b>	<b>n=2,129,223</b>		<b>n=2,938,626</b>	
Any psychiatric disorder <sup>a</sup>	219,917	(10.33)	610,729	(20.78)
Depressive disorders	126,402	(5.94)	332,102	(11.30)
Anxiety disorders	53,896	(2.53)	179,798	(6.12)
PTSD	36,844	(1.73)	303,045	(10.31)
Bipolar disorders	10,591	(0.50)	31,681	(1.08)
Psychotic-spectrum disorders	36,293	(1.70)	37,171	(1.26)
<sup>a</sup> Positive for any disorder from ≥1 of the 5 categories: depressive disorders, anxiety disorders, PTSD, bipolar disorders, psychotic-spectrum disorders				

**Table S2b.** VA Patient Demographics, overall and by presence or absence of one or more of the psychiatric disorders from the 5 most common categories, 2005 and 2019.

	2005 (N=4,332,165)						2019 (N=5,657,277)					
	Overall		No Psychiatric Disorder		Any Psychiatric Disorder <sup>a</sup>		Overall		No Psychiatric Disorder		Any Psychiatric Disorder <sup>a</sup>	
	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)	n	(%)
<b>Overall</b>			<b>n=3,508,146</b>		<b>n=824,019</b>				<b>n=4,004,673</b>		<b>n=1,652,604</b>	
Sex												
Female	216,961	(5.0)	152,505	(4.4)	64,456	(7.8)	522,707	(9.2)	284,660	(7.1)	238,047	(14.4)
Male	4,115,199	(95.0)	3,355,636	(95.7)	759,563	(92.2)	5,134,565	(90.8)	3,720,009	(93.0)	1,414,556	(85.6)
Race/Ethnicity												
Non-Hispanic White	3,407,953	(78.7)	2,782,872	(79.3)	625,081	(75.9)	3,978,984	(70.3)	2,901,865	(72.5)	1,077,119	(65.2)
Non-Hispanic Black	605,523	(14.0)	473,295	(13.5)	132,228	(16.1)	1,017,033	(18.0)	664,225	(16.6)	352,808	(21.4)
Hispanic/Latino	140,871	(3.3)	107,547	(3.1)	33,324	(4.0)	342,413	(6.1)	213,745	(5.3)	128,668	(7.8)
Other/Multiple	99,714	(2.3)	77,855	(2.2)	21,859	(2.7)	187,997	(3.3)	125,545	(3.1)	62,452	(3.8)
Unknown	78,104	(1.8)	66,577	(1.9)	11,527	(1.4)	130,850	(2.3)	99,293	(2.5)	31,557	(1.9)
Age												
<35	187,692	(4.3)	149,780	(4.3)	37,912	(4.6)	482,749	(8.5)	279,363	(7.0)	203,386	(12.3)
35-64	2,015,250	(46.5)	1,449,060	(41.3)	566,190	(68.7)	2,235,902	(39.5)	1,397,413	(34.9)	838,489	(50.7)
65+	2,129,223	(49.2)	1,909,306	(54.4)	219,917	(26.7)	2,938,626	(51.9)	2,327,897	(58.1)	610,729	(37.0)
Age, M(SD)			64.8	(14.7)	58.4	(13.5)			64.4	(16.4)	56.0	(16.0)

<b>&lt;35</b>			<b>n=149,780</b>		<b>n=37,912</b>				<b>n=279,363</b>		<b>n=203,386</b>	
Sex												
Female	43,221	(23.0)	32,967	(22.0)	10,254	(27.1)	95,330	(19.8)	48,122	(17.2)	47,208	(23.2)
Male	144,471	(77.0)	116,813	(78.0)	27,658	(73.0)	387,419	(80.3)	231,241	(82.8)	156,178	(76.8)
Race/Ethnicity												
White	110,641	(59.0)	85,123	(56.8)	25,518	(67.0)	286,132	(59.3)	163,776	(58.6)	122,356	(60.2)
Black	37,011	(19.7)	30,617	(20.4)	6,394	(16.9)	80,380	(16.7)	44,342	(15.9)	36,038	(17.7)
Hispanic/Latino	16,556	(8.8)	13,664	(9.1)	2,892	(7.6)	64,013	(13.3)	37,126	(13.3)	26,887	(13.2)
Other/Multiple	7,119	(3.8)	5,689	(3.8)	1,430	(3.8)	27,335	(5.7)	16,031	(5.7)	11,304	(5.6)
Unknown	16,365	(8.7)	14,687	(9.8)	1,678	(4.4)	24,889	(5.2)	18,088	(6.5)	6,801	(3.3)
Age, M(SD)			28.0	(3.9)	28.7	(3.8)			29.5	(3.3)	30.2	(3.1)
<b>35-64</b>												
			<b>n=1,449,060</b>		<b>n=566,190</b>				<b>n=1,397,413</b>		<b>n=838,489</b>	
Sex												
Female	86,773	(6.0)	86,773	(6.0)	48,041	(8.5)	181,474	(13.0)	181,474	(13.0)	164,740	(19.7)
Male	1,362,285	(94.0)	1,362,285	(94.0)	518,149	(91.5)	1,215,937	(87.0)	1,215,937	(87.0)	673,748	(80.4)
Race/Ethnicity												
White	1,000,537	(69.1)	1,000,537	(69.1)	406,905	(71.9)	816,049	(58.4)	816,049	(58.4)	489,828	(58.4)
Black	305,575	(21.1)	305,575	(21.1)	109,189	(19.3)	355,695	(25.5)	355,695	(25.5)	219,774	(26.2)
Hispanic/Latino	57,053	(3.9)	57,053	(3.9)	24,835	(4.4)	98,268	(7.0)	98,268	(7.0)	71,762	(8.6)
Other/Multiple	38,816	(2.7)	38,816	(2.7)	16,118	(2.9)	54,629	(3.9)	54,629	(3.9)	34,277	(4.1)

Unknown	47,079	(3.3)	47,079	(3.3)	9,143	(1.6)	72,772	(5.2)	72,772	(5.2)	22,848	(2.7)
Age, M(SD)	54.0	(7.4)	54.0	(7.4)	53.6	(6.9)	52.4	(8.6)	52.4	(8.6)	50.2	(9.0)
<b>≥65</b>												
			<b>n=1,909,306</b>		<b>n=219,917</b>				<b>n=2,327,897</b>		<b>n=610,729</b>	
Sex												
Female	32,765	(1.7)	32,765	(1.7)	6,161	(2.8)	55,064	(2.4)	55,064	(2.4)	26,099	(4.3)
Male	1,876,538	(98.3)	1,876,538	(98.3)	213,756	(97.2)	2,272,831	(97.6)	2,272,831	(97.6)	584,630	(95.7)
Race/Ethnicity												
White	1,697,212	(88.9)	1,697,212	(88.9)	192,658	(87.6)	1,922,040	(82.6)	1,922,040	(82.6)	464,935	(76.1)
Black	137,103	(7.2)	137,103	(7.2)	16,645	(7.6)	264,188	(11.4)	264,188	(11.4)	96,996	(15.9)
Hispanic/Latino	36,830	(1.9)	36,830	(1.9)	5,597	(2.6)	78,351	(3.4)	78,351	(3.4)	30,019	(4.9)
Other/Multiple	33,350	(1.8)	33,350	(1.8)	4,311	(2.0)	54,885	(2.4)	54,885	(2.4)	16,871	(2.8)
Unknown	4,811	(0.3)	4,811	(0.3)	706	(0.3)	8,433	(0.4)	8,433	(0.4)	1,908	(0.3)
Age, M(SD)	75.8	(6.4)	75.8	(6.4)	75.8	(6.6)	75.7	(7.5)	75.7	(7.5)	72.6	(5.8)
<sup>a</sup> Positive for any disorder from ≥1 of the 5 categories: depressive disorders, anxiety disorders, PTSD, bipolar disorders, psychotic-spectrum disorders												

**Table S3.** Age-Stratified Change in the Diagnostic Prevalence of CUD by 5 Categories of Psychiatric Disorders<sup>a</sup> in VA patients, 2005-2019.

	Predicted Prevalence of ICD-9-CM CUD diagnoses, 2005-2014 <sup>b</sup>						Predicted Prevalence of ICD-10-CM CUD diagnoses, 2016-2019 <sup>b</sup>					
	2005		2014		Change	95% CI	2016		2019		Change	95% CI
	%	95% CI	%	95% CI			%	95% CI	%	95% CI		
<b>Depressive disorders</b>												
<35	5.27	4.96-5.58	10.34	10.14-10.53	<b>5.06</b>	<b>4.70-5.43</b>	10.30	10.10-10.49	10.14	9.96-10.32	-0.16	-0.42-0.11
35-64	4.25	4.18-4.32	6.92	6.85-7.00	<b>2.67</b>	<b>2.57-2.78</b>	6.21	6.13-6.28	6.58	6.51-6.65	<b>0.37</b>	<b>0.27-0.48</b>
≥65	0.22	0.19-0.26	1.72	1.67-1.76	<b>1.49</b>	<b>1.44-1.55</b>	1.98	1.93-2.03	2.99	2.93-3.05	<b>1.01</b>	<b>0.93-1.09</b>
<b>Anxiety disorders</b>												
<35	5.15	4.68-5.63	10.61	10.38-10.84	<b>5.45</b>	<b>4.93-5.98</b>	10.82	10.59-11.05	10.74	10.53-10.94	-0.09	-0.40-0.22
35-64	3.71	3.59-3.82	7.47	7.36-7.58	<b>3.76</b>	<b>3.60-3.92</b>	7.01	6.90-7.12	7.56	7.47-7.66	<b>0.55</b>	<b>0.41-0.70</b>
≥65	0.14	0.10-0.18	1.64	1.58-1.70	<b>1.50</b>	<b>1.43-1.58</b>	1.96	1.89-2.04	3.14	3.06-3.23	<b>1.18</b>	<b>1.07-1.29</b>
<b>PTSD</b>												
<35	4.84	4.47-5.20	10.41	10.23-10.58	<b>5.57</b>	<b>5.16-5.97</b>	10.33	10.15-10.50	11.69	11.49-11.89	<b>1.36</b>	<b>1.10-1.63</b>
35-64	3.98	3.90-4.07	6.82	6.73-6.92	<b>2.84</b>	<b>2.71-2.96</b>	6.05	5.97-6.14	6.61	6.54-6.69	<b>0.56</b>	<b>0.45-0.67</b>
≥65	0.38	0.29-0.47	2.08	2.03-2.14	<b>1.70</b>	<b>1.60-1.81</b>	2.22	2.16-2.27	3.77	3.69-3.86	<b>1.56</b>	<b>1.46-1.65</b>
<b>Bipolar disorders</b>												
<35	10.67	9.82-11.53	22.09	21.43-22.75	<b>11.41</b>	<b>10.33-12.49</b>	22.28	21.62-22.93	23.78	23.13-24.43	<b>1.50</b>	<b>0.58-2.43</b>
35-64	7.34	7.13-7.55	13.10	12.87-13.33	<b>5.76</b>	<b>5.45-6.07</b>	12.61	12.37-12.85	14.77	14.52-15.01	<b>2.16</b>	<b>1.82-2.50</b>
≥65	0.56	0.39-0.72	3.74	3.52-3.96	<b>3.19</b>	<b>2.91-3.46</b>	4.42	4.18-4.67	6.71	6.43-6.99	<b>2.29</b>	<b>1.92-2.66</b>
<b>Psychotic disorders</b>												

<35	12.39	11.32-13.46	30.24	29.28-31.21	<b>17.85</b>	<b>16.41-19.29</b>	31.11	30.13-32.09	33.66	32.67-34.65	<b>2.54</b>	<b>1.15-3.94</b>
35-64	6.07	5.91-6.23	12.89	12.65-13.14	<b>6.82</b>	<b>6.53-7.12</b>	12.61	12.34-12.87	15.69	15.39-16.00	<b>3.09</b>	<b>2.68-3.49</b>
≥65	0.35	0.27-0.44	2.82	2.67-2.97	<b>2.47</b>	<b>2.29-2.64</b>	3.11	2.94-3.28	4.85	4.65-5.04	<b>1.74</b>	<b>1.48-2.00</b>

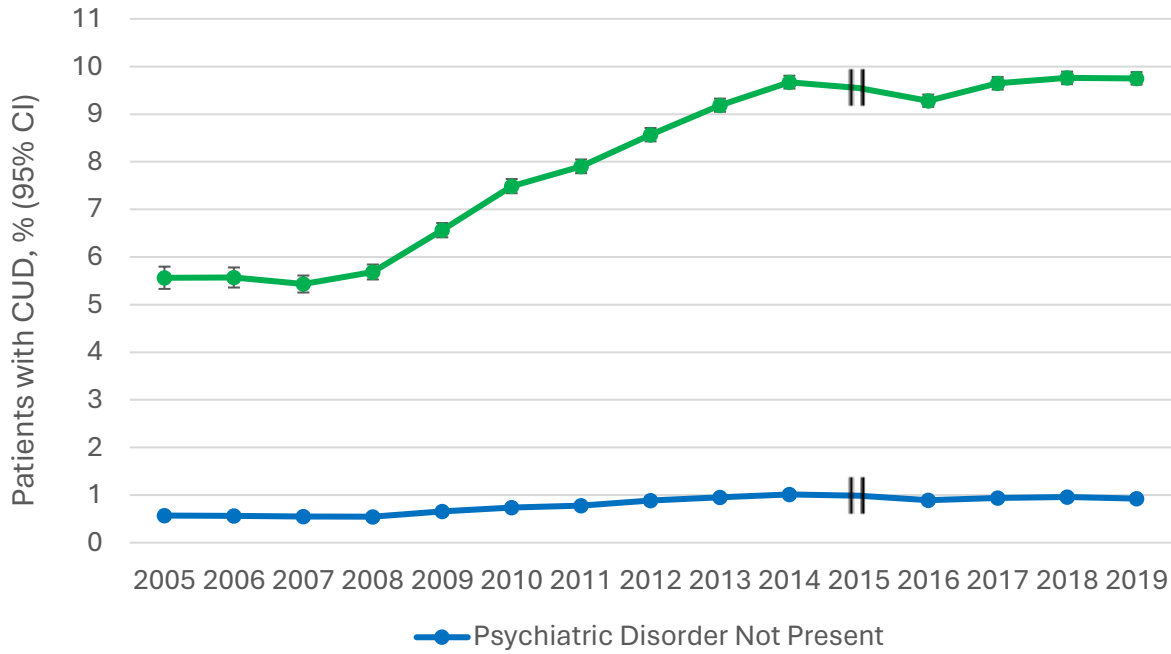
<sup>a</sup> Categories are not mutually exclusive.

<sup>b</sup> Models include year, mental health condition, year X mental health condition, sex, race/ethnicity, continuous age.

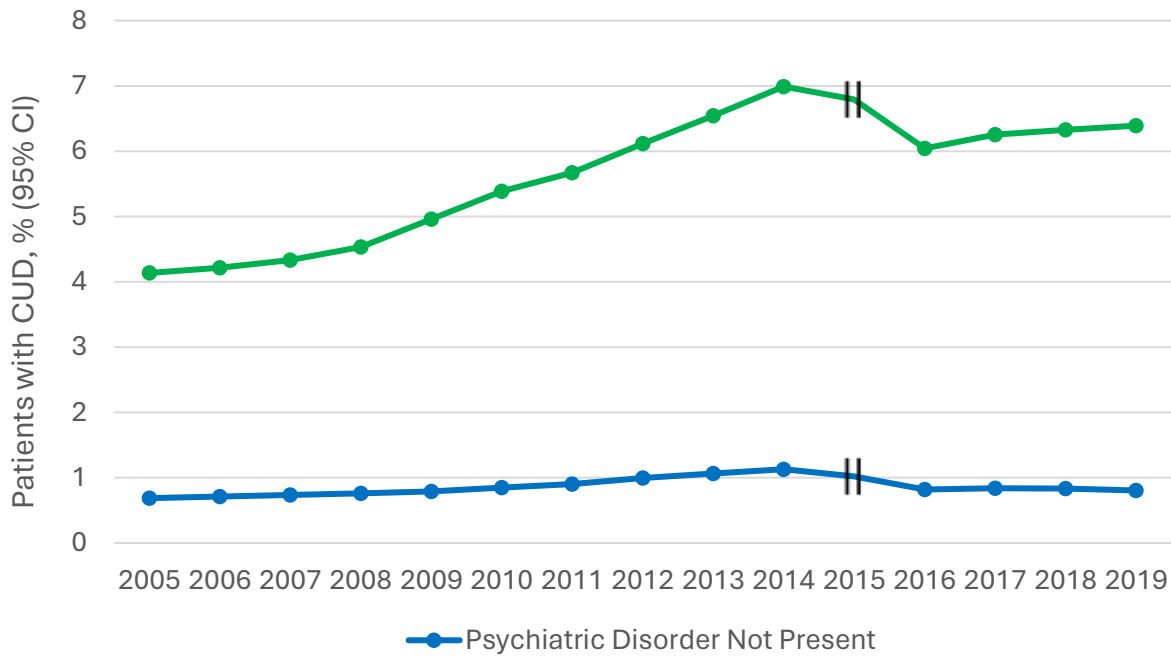
Note: Bolded values indicate statistically significant change in prevalence of CUD from 2005 to 2014 and 2016-2019.

**Figures S1a-S1c.** Age-Stratified Trends in Prevalence of CUD by Any Psychiatric Disorder<sup>a</sup> in VA Patients, 2005-2019

**Figure S1a.** Prevalence of CUD by Any Psychiatric Disorder, <35 Years

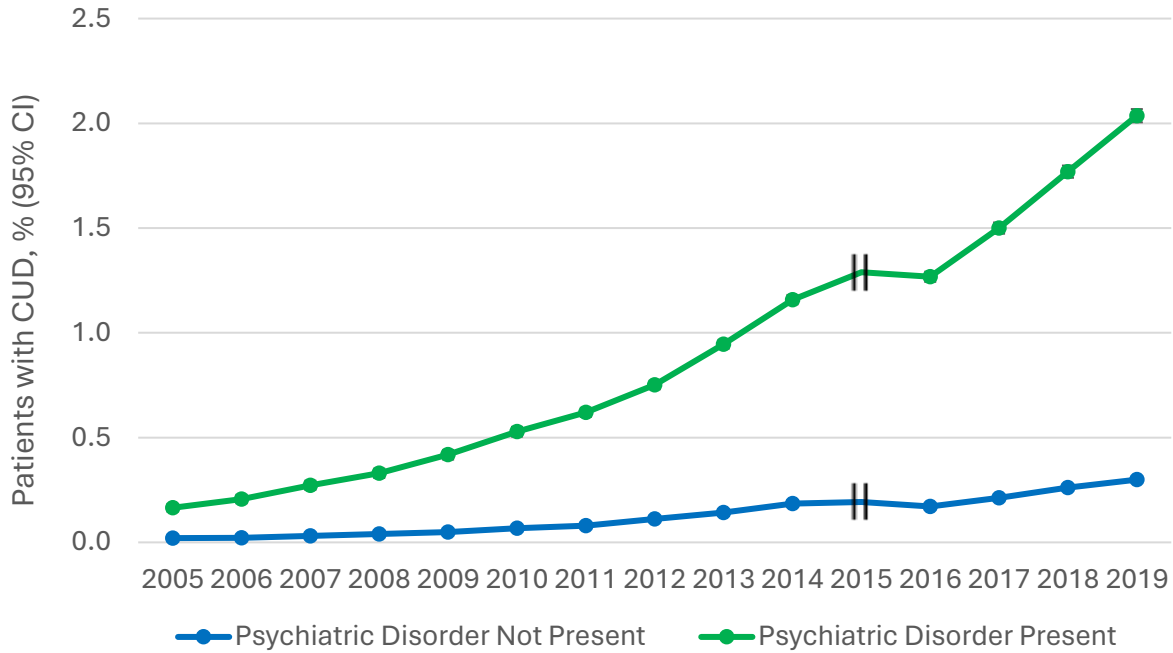


**Figure S1b.** Prevalence of CUD by Any Psychiatric Disorder, 35-64 Years





**Figure S1c.** Prevalence of CUD by Any Psychiatric Disorder, 65+ Years



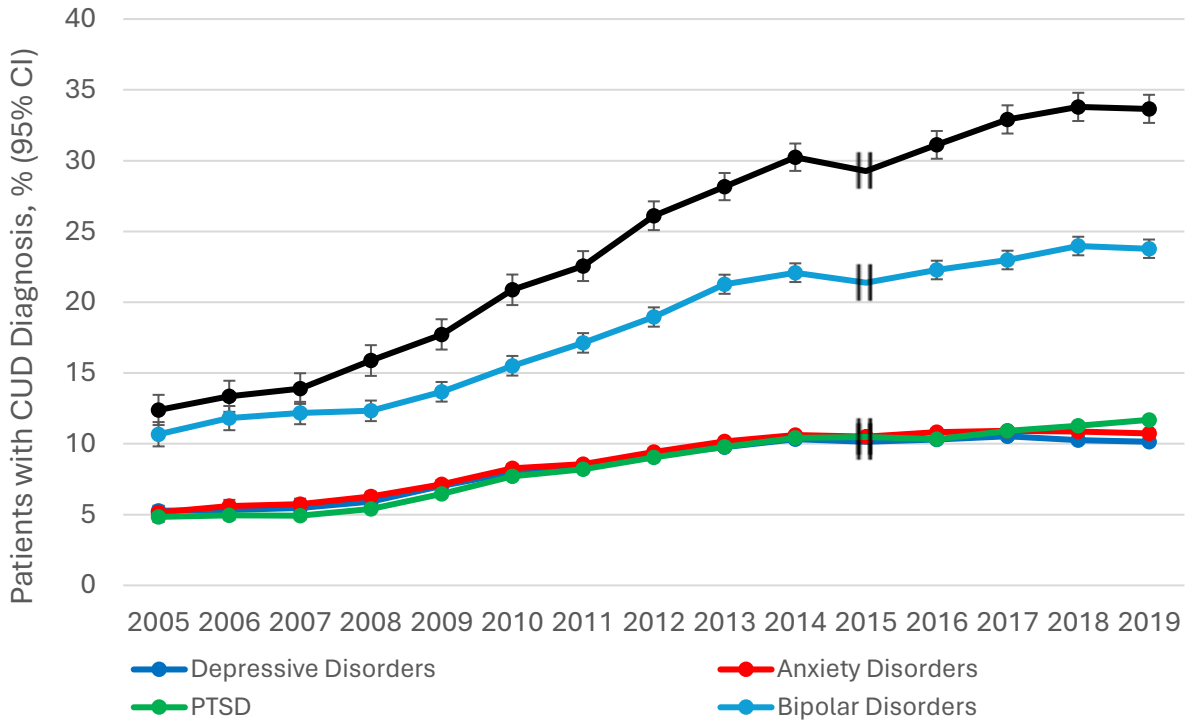
<sup>a</sup>Dichotomous psychiatric summary variable indicating if patients were positive for any disorder from  $\geq 1$  of the 5 categories (depressive disorders, anxiety disorders, PTSD, bipolar disorders, psychotic-spectrum disorders) each year, 2005-2014 and 2016-2019.

Error bars indicate 95% confidence intervals (95% CI). In cases of narrow 95% CI, error bars may be difficult to visualize.

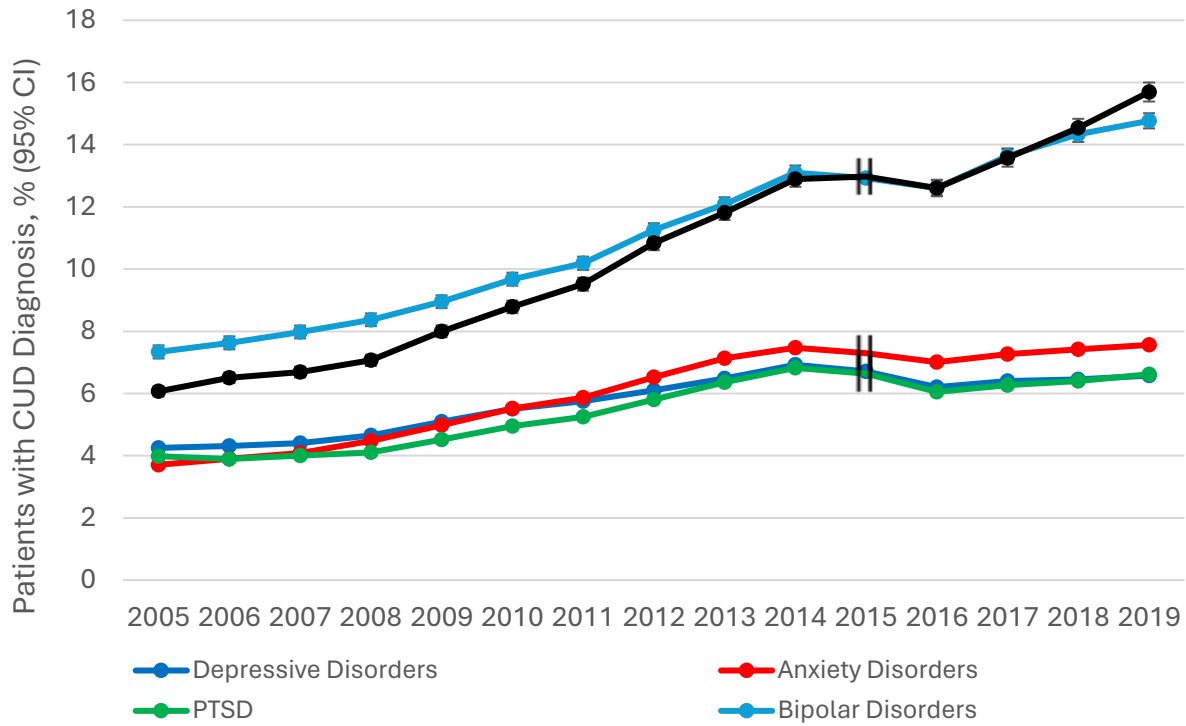
Hatch marks at 2015 indicate that this year was not included in models due to a change in ICD coding

**Figures S2a-S2c.** Age-Stratified Trends in Prevalence of CUD by 5 Categories of Psychiatric Disorders<sup>1</sup> in VA patients, 2005-2019.

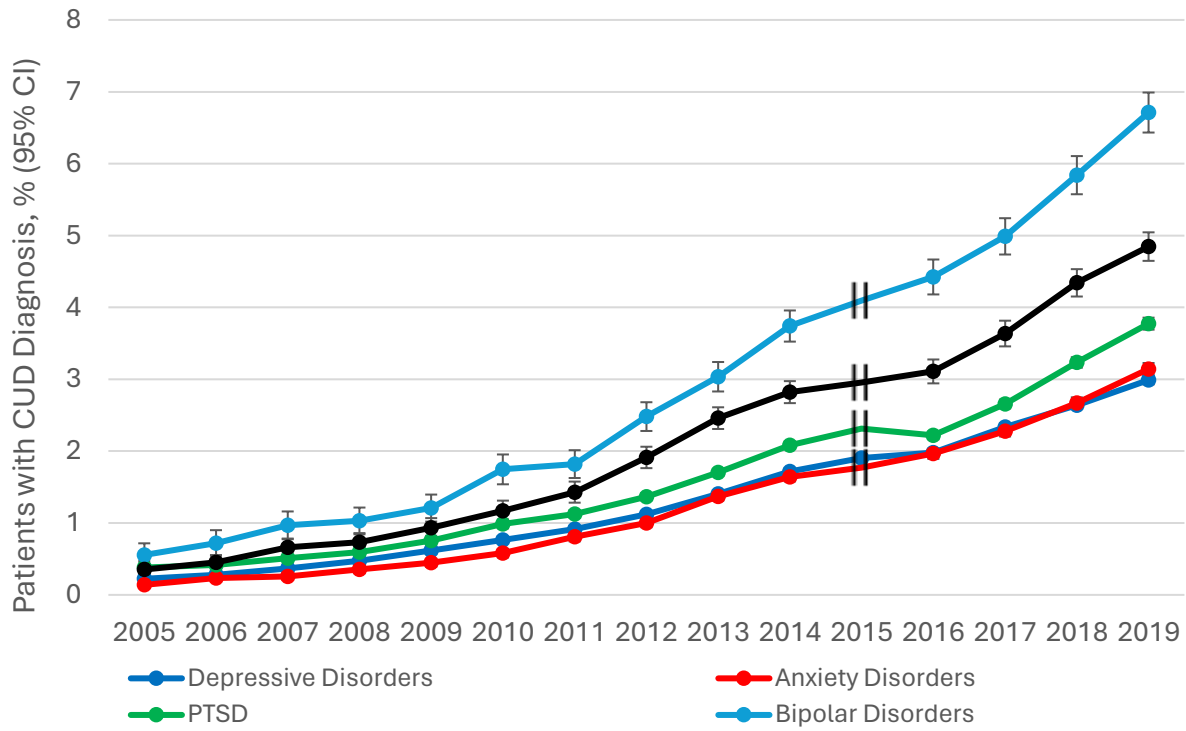
**Figure S2a. Prevalence of CUD by Psychiatric Disorders, <35 Years**



**Figure S2b. Prevalence of CUD by Psychiatric Disorders, 35-64 Years**



**Figure S2c.** Prevalence of CUD by Psychiatric Disorders, 65+ Years



<sup>1</sup> Disorder categories are not mutually exclusive.

Error bars indicate 95% confidence intervals (95% CI). In cases of narrow 95% CI, error bars may be difficult to visualize.

Hatch marks at 2015 indicate that this year was not included in models due to a change in ICD coding.