

Supplementary Online Content

Trends in Outpatient Psychotherapy Provision by US Psychiatrists: 1996-2016

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Table S1. ICD-9 CM and ICD-10 CM Diagnostic Codes		
	ICD-9 CM	ICD-10 CM
Major depressive disorder	296.2, 296.3	F32-F32.5, F32.9, F33-F33.42, F33.9
Dysthymic disorder	300.4	F34.1
Bipolar disorder	296.0-296.09, 296.4-296.8	F31-F31.9
Other mood disorders	296.9, 311	F30, F34, F39
Generalized anxiety disorder	300.02	F41.1
Panic disorder	300.01, 300.21	F40.01, F41.0
Obsessive-compulsive disorder	300.3	F42
Posttraumatic stress disorder	309.81	F43.1
Social phobia	300.23	F40.1
Other anxiety disorders	300.00, 300.09, 300.20, 300.22, 300.29	F40.2, F40.8, F41.8, F41.9
Schizophrenia	295	F20
Personality disorders	301	F60

Table S2. Generic Psychotropic Medication Names by Classes

Antidepressants		Antipsychotics	Mood stabilizers	Sedative-hypnotics
Amitriptyline	Selegiline	Aripiprazole	Carbamazepine	Alprazolam
Amoxapine	Sertraline	Asenapine	Divalproex sodium	Buspirone
Bupropion	Tranlycypromine	Chlorpromazine	Lamotrigine	Chloral hydrate
Citalopram	Trazodone	Clozapine	Lithium	Chlordiazepoxide
Clomipramine	Trimipramine	Fluphenazine	Valproic acid	Clonazepam
Desipramine	Venlafaxine	Haloperidol		Clorazepate
Desvenlafaxine	Vilazodone	Iloperidone		Diazepam
Doxepin	Vortioxetine	Loxapine		Diphenhydramine
Duloxetine		Lurasidone		Estazolam
Escitalopram		Mesoridazine		Eszopiclone
Fluoxetine		Molindone		Flurazepam
Fluvoxamine		Olanzapine		Hydroxyzine
Imipramine		Paliperidone		Lorazepam
Isocarboxazid		Perphenazine		Meprobamate
Levomilnacipran		Pimozide		Oxazepam
Maprotiline		Prochlorperazine		Pentobarbital
Milnacipran		Quetiapine		Phenobarbital
Mirtazapine		Risperidone		Promethazine
Nefazodone		Thioridazine		Quazepam
Nortriptyline		Thiothixene		Suvorexant
Paroxetine		Trifluoperazine		Temazepam
Phenelzine		Ziprasidone		Triazolam
Protriptyline				Zaleplon
Rasagiline				Zolpidem

Prescribed	54.5	3033	69.7	3604	76.1	5120	32.3	1.7	26.8	2.4	19.5	2.3
Not prescribed	11.9	721	7.9	534	11.9	962	62.1	1.4	63.3	6.3	45.1	6.2
Medication class												
Antidepressants	38.8	2215	49.5	2514	49.3	3278	35.8	1.9	27.2	2.7	19.5	2.2
Antipsychotics	12.5	645	22.3	1092	22	1502	25.2	1.6	17.9	2.7	16.7	2.5
Mood stabilizers	8	427	10.5	546	13.6	848	26.5	2.4	23.7	3.4	18.9	3.3
Sedative-hypnotics	19	1056	27.5	1339	27.7	1881	33.9	2.3	26.8	3.3	20.1	3.2
Source of payment^d												
Private insurance	26.6	1535	38.1	1974	40.6	2706	33.6	2.4	30.5	3	21.3	3.2
Medicare	7.2	390	11.2	489	14	920	35.3	2.1	24.6	3.5	19	5.2
Medicaid	7.5	392	10.7	582	11.7	927	17	1.7	6.4	1.5	4.1	1.2
Self-pay	17.2	1038	12.3	773	20.3	1289	60	1.6	58.8	5.8	44.8	5
Other	4.7	257	3.6	211	3.6	260	23.6	3.1	31.4	7.4	13.1	4.4
Office setting^d												
Freestanding, solo-practice	41.3	2373	44.3	2590	59.5	3592	48.3	2.5	45.8	3.9	31.3	3.7
Freestanding, group-practice	15.2	804	21.7	934	14.4	1220	23.1	3.2	13.4	2.4	13.9	5.7
HMO or other	10	577	12.8	678	19.4	1514	15.4	1.6	7.6	3	5.9	1.5
Region												
Northeast	21.1	1079	22.5	1411	26	1141	48.8	3.6	46.6	5.1	31.3	6
Midwest	12.8	632	11.1	630	15.2	1439	20.5	2.9	26.3	7.2	22.9	6.6
South	16.7	1030	28.5	1102	29.3	1946	32.2	2.3	16.2	3	7.8	2
West	15.7	1013	16.7	1059	22.6	1800	42.4	2.8	36.7	5.8	34.6	6.2
Location												
Metropolitan	58.2	3371	71.7	3872	90	5879	38.1	1.4	33.1	2.8	24.1	2.6
Nonmetropolitan	8.2	383	7.2	330	3.2	447	34.4	9.3	6.1	2.9	3.4	2

^a Visits adjusted by survey weighting.

^b Diagnosis numbers can be greater than visits since a visit can involve up to 3 diagnoses.

Data from the National Ambulatory Medical Care Survey (NAMCS) 1996-2016.

Prescribed	119	6951	162.5	8303	181.2	8831	31.3	1.3	25.2	1.6	20.4	1.8	-0.8	-1.2, -0.5	< 0.001
Not prescribed	30	2103	20.5	1300	24.6	1379	63.5	1.3	54.4	4	50.5	4.8	-0.9	-1.5, -0.3	0.004
Medication class															
Antidepressants	86.1	5076	113.7	5821	117.8	5682	33.3	1.4	26.4	1.8	21.3	2	-0.9	-1.3, -0.6	< 0.001
Antipsychotics	28.1	1549	51.3	2474	51.5	2721	23.4	1.7	16.8	1.6	15.9	1.7	-0.5	-0.9, -0.2	0.001
Mood stabilizers	17.7	1033	25.1	1273	30.6	1511	28.6	1.9	23.1	2.3	20.9	2.9	-0.7	-1.2, -0.2	0.007
Sedative-hypnotics	42.2	2442	60	2971	69.7	3355	32.3	1.5	26.2	2.1	20.6	2.3	-0.9	-1.3, -0.5	< 0.001
Source of payment^d															
Private insurance	58.9	3412	85.3	4387	93	4347	32.9	1.8	27.4	2.1	22.5	2.8	-0.8	-1.3, -0.3	0.004
Medicare	14.4	877	25.8	1153	29.7	1500	32.6	2.1	20.9	2.4	15.1	3.1	-1.1	-1.7, -0.6	< 0.001
Medicaid	12.8	750	25.9	1320	26.1	1581	16.4	1.9	10	1.5	5.6	1	-0.9	-1.1, -0.7	< 0.001
Self-pay	32.1	2025	32.7	1998	50.1	2284	58.9	2	53.2	4	45.3	3.6	-1.2	-1.7, -0.7	< 0.001
Other	8.1	469	10.2	523	7	430	23.8	2.5	28.5	4.9	17.3	3.7	-0.7	-1.4, -0.1	0.03
Office setting^d															
Freestanding, solo-practice	83.8	5008	108.3	5891	129.5	5963	46.8	1.6	39.4	2.6	33.5	3.1	-1	-1.5, -0.4	0.001
Freestanding, group-practice	29.9	1672	50.4	2337	44.3	2099	19.7	3	14.5	2.1	14.8	3.3	-0.6	-1, -0.1	0.01
HMO or other	18.1	1150	26.1	1464	39.7	2462	17	3.3	11	2.2	5.1	1	-0.9	-1.2, -0.5	< 0.001
Region															
Northeast	44.1	2709	47.5	2809	66.5	2202	50.9	2.6	38.7	3.7	33.8	4.6	-1.2	-1.9, -0.5	0.001
Midwest	27.1	1721	31.3	1721	34.3	2480	28.9	2.7	26.1	4.1	15.2	3.5	-1.1	-1.8, -0.4	0.003
South	46.5	2569	68.7	2843	62.3	2977	27	1.8	18.5	2.2	10	1.9	-1.4	-1.7, -1	< 0.001
West	31.3	2055	37.2	2319	50.5	2865	42.9	2.8	36.3	4	35.9	5	-0.5	-1.3, 0.3	0.23
Location															
Metropolitan	134.8	8237	165.8	8794	206.6	9865	38.9	1.3	30.6	1.8	24.8	2.1	-1	-1.4, -0.7	< 0.001
Nonmetropolitan	14.1	817	19	898	6.9	659	26.8	6	10.9	3.8	12.1	5.3	-1.8	-3.1, -0.6	0.006

^a Visits adjusted by survey weighting.

^b Analysis based on weighted visit samples 1996-2016.

^c Diagnosis numbers can be greater than visits since a visit can involve up to 3 diagnoses.

^d Data missing for 1996.

Data from the National Ambulatory Medical Care Survey (NAMCS) 1996-2016.

Table S5. Associations of Visit Characteristics with Psychotherapy Provision in Psychiatrist Visits 2010-2016^a

Visit Characteristics	Bivariate Logistic Regression			Multivariate Logistic Regression		
	Risk Difference %	95% CI	p Value	Adjusted Risk Difference %	95% CI	p Value
Survey year	-0.9	-3.3, 1.4	0.44	-2.1	-4.1, 0	< 0.05
Age						
<25	0 [reference]	...	...	0 [reference]	...	...
25-44	9.2	4.3, 14.2	< 0.001	5.3	0.4, 10.3	0.04
45-64	7.4	2.5, 12.3	0.003	4.5	0, 9	0.05
65≤	12.5	4.4, 20.7	0.003	8.9	2, 15.8	0.01
Gender						
Male	0 [reference]	...	...	0 [reference]	...	...
Female	1	-2.3, 4.3	0.55	0.5	-2.4, 3.3	0.74
Race/ethnicity						
White	0 [reference]	...	...	0 [reference]	...	...
Black or African American	-9.4	-14.6, -4.1	< 0.001	2.4	-3.4, 8.1	0.42
Hispanic or Latino	-11.1	-16.5, -5.6	< 0.001	-5.4	-11.1, 0.3	0.06
Other	2.7	-9.3, 14.8	0.66	0.9	-8.4, 10.2	0.86
Psychiatric diagnosis						
Major depressive disorder	-1.4	-6.4, 3.7	0.6	2	-5, 9	0.57
Dysthymic disorder	11.2	3.6, 18.7	0.004	6	-0.7, 12.8	0.08
Bipolar disorder	-7.4	-12.6, -2.2	0.005	-1.5	-8, 5	0.65
Other mood disorder	1.6	-4.4, 7.6	0.6	2.5	-3.8, 8.7	0.44
Generalized anxiety disorder	-0.7	-7.6, 6.1	0.83	2.4	-4.5, 9.2	0.5
Panic disorder	-9.4	-18.6, -0.2	< 0.05	-3.3	-10.5, 4	0.38
Posttraumatic stress disorder	-0.1	-7.7, 7.6	0.98	4	-3, 11.1	0.26
Social phobia	-6.2	-17.9, 5.5	0.3	0.5	-8.1, 9.2	0.91
Other anxiety disorder	7.8	1.8, 13.7	0.01	7.9	1.1, 14.7	0.02
Obsessive-compulsive disorder	5	-1.4, 11.4	0.12	4.3	-1.7, 10.2	0.16
Schizophrenia	-18.4	-26.7, -10	< 0.001	-3.4	-11, 4.3	0.39
Personality disorders	17.4	7.8, 27	< 0.001	14.6	7.1, 22.1	< 0.001
Comorbidity						
No psychiatric comorbidities	0 [reference]	...	...	0 [reference]	...	...
Psychiatric comorbidities	0.2	-4.7, 5.1	0.94	-1.7	-7.6, 4.2	0.58
Medication^b						
Prescribed	0 [reference]	...	...	...	...	...
Not prescribed	30	21.4, 38.6	< 0.001	...	...	...

Medication class						
Antidepressants	-6.6	-11.2, -2	0.005	-2.9	-7.1, 1.3	0.17
Antipsychotics	-12.4	-17.3, -7.5	< 0.001	-2.4	-5.6, 0.8	0.14
Mood stabilizers	-4.3	-10, 1.3	0.13	0	-5, 4.9	0.99
Sedative-hypnotics	-5.6	-9.8, -1.4	0.009	-3.3	-6.5, -0.1	0.04
Source of payment^c						
Private insurance	0 [reference]	...	...	0 [reference]	...	...
Medicare	-7.5	-13.9, -1	0.02	-6.5	-12.1, -0.8	0.02
Medicaid	-16.9	-22.5, -11.4	< 0.001	-11	-16.8, -5.1	< 0.001
Self-pay	22.7	14.1, 31.3	< 0.001	15.4	7.6, 23.2	< 0.001
Other	-5.3	-14, 3.4	0.23	-0.4	-8, 7.2	0.91
Office setting^c						
Freestanding, solo-practice	0 [reference]	...	...	0 [reference]	...	...
Freestanding, group-practice	-18.8	-28, -9.6	< 0.001	-10	-20.8, 0.9	0.07
HMO or other	-28.1	-34.7, -21.6	< 0.001	-19.4	-27.7, -11.2	< 0.001
Region						
Northeast	0 [reference]	...	...	0 [reference]	...	...
Midwest	-18.6	-30, -7.3	0.001	-10	-20.8, 0.9	0.07
South	-23.7	-33.5, -13.8	< 0.001	-19.4	-27.7, -11.2	< 0.001
West	2.1	-11.3, 15.5	0.76	4.6	-6.6, 15.7	0.42
Location						
Metropolitan	0 [reference]	...	...	0 [reference]	...	...
Nonmetropolitan	-12.7	-25.7, 0.3	0.06	3	-9.5, 15.5	0.64

^a Analysis based on weighted visit samples.

^b Omitted from multivariate model due to multicollinearity with medication class. When omitting medication class covariates: Not prescribed Adjusted Risk Difference=17.4% (CI=10.1%,24.8%; $p < 0.001$).

Data from the National Ambulatory Medical Care Survey (NAMCS) 2010-2016.

Table S6. Caseload Composition of Psychiatrists Providing Psychotherapy in All, Some, or No Patient Visits^a

	No Psychotherapy Visits		Some Psychotherapy Visits		All Psychotherapy Visits		<i>p</i> Value
	Proportion %	95% CI	Proportion %	95% CI	Proportion %	95% CI	
Psychiatric diagnosis^b							
Major depressive disorder	27	24.8, 29.2	27.8	26.2, 29.4	21.4	16.8, 26.1	0.04
Dysthymic disorder	4.4	3.7, 5.2	8.8	7.9, 9.6	13.9	11.2, 16.6	< 0.001
Bipolar disorder	16.6	15.1, 18.1	14.4	13.4, 15.4	7.8	6, 9.5	< 0.001
Other mood disorder	17.1	15, 19.3	13.2	12.1, 14.2	17.8	13.7, 22	0.04
Generalized anxiety disorder	7.3	5.9, 8.7	7	6, 8	9.1	6.4, 11.9	0.23
Panic disorder	6	5, 7	5.4	4.8, 6	3.7	2.2, 5.3	0.07
Posttraumatic stress disorder	3	2.5, 3.5	4.3	3.9, 4.8	5.1	3.6, 6.5	0.005
Social phobia	8.3	7.2, 9.4	8.3	7.4, 9.3	14.3	10.2, 18.4	0.002
Other anxiety disorder	4.9	4.1, 5.7	4.8	4.1, 5.5	4.4	2.9, 5.9	1
Obsessive-compulsive disorder	0.8	0.6, 1	1	0.8, 1.2	1.2	0.5, 2	0.44
Schizophrenia	8.1	6.7, 9.4	5.9	5.2, 6.6	2.1	1.3, 3	< 0.001
Personality disorders	2.5	1.9, 3.1	6.1	5.2, 6.9	8.1	5.8, 10.3	< 0.001
Comorbidity							
Psychiatric comorbidities	19.5	17.4, 21.5	20.6	19.1, 22.1	20.8	16.9, 24.7	1

^a Analysis based on weighted visit samples.

^b Aggregate proportions can be greater than 100% since a visit can involve up to 3 diagnoses.

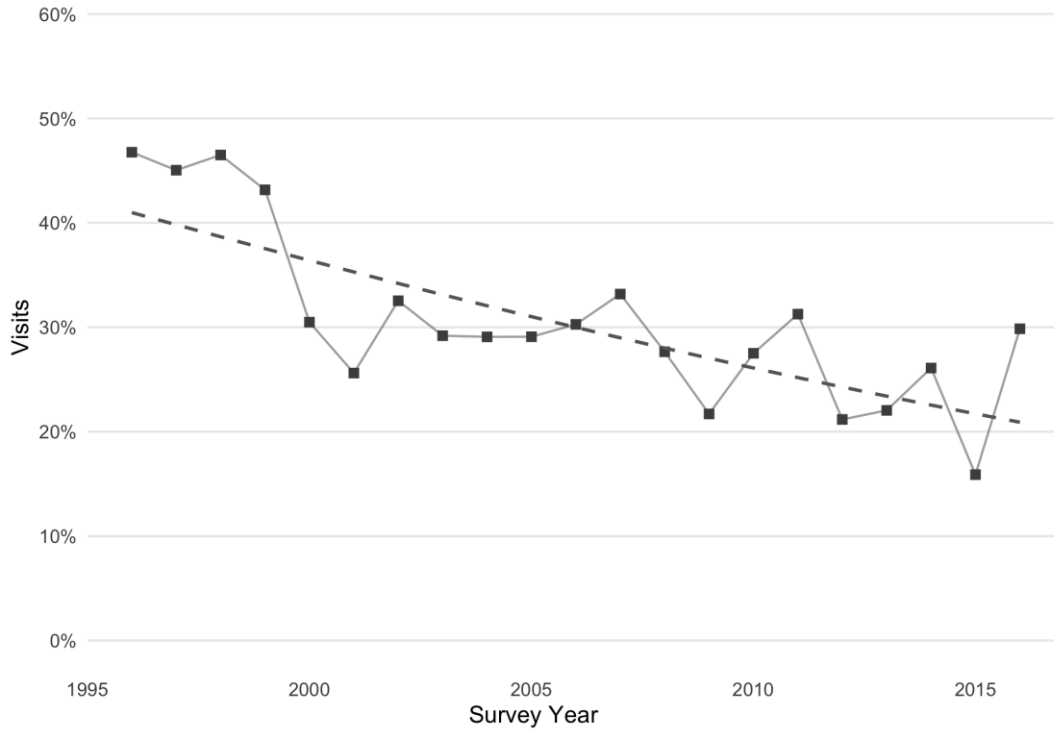
Data from the National Ambulatory Medical Care Survey (NAMCS) 1996-2016.

Table S7. Associations of Visit Characteristics with Psychotherapy Provision in Psychiatrist Visits Controlling for Psychotherapy Provision in All, Some, or No Visits^a

Visit Characteristics	Multivariate Logistic Regression		
	Adjusted Risk Difference %	95% CI	<i>p</i> Value
Survey year	-0.7	-1.1, -0.3	0.002
Age			
<25	0 [reference]	...	...
25-44	5	1.2, 8.8	0.01
45-64	6.1	2.5, 9.6	0.001
65≤	5.9	0.1, 11.8	< 0.05
Gender			
Male	0 [reference]		...
Female	-1.7	-3.4, 0	0.06
Race/ethnicity			
White	0 [reference]	...	...
Black or African American	-3.8	-7.5, 0	< 0.05
Hispanic or Latino	-9.5	-13.3, -5.7	< 0.001
Other	1.4	-11.3, 14.1	0.83
Psychiatric diagnosis			
Major depressive disorder	-0.2	-4.4, 4	0.93
Dysthymic disorder	7.7	3.7, 11.7	< 0.001
Bipolar disorder	0.1	-4.7, 4.9	0.96
Other mood disorder	3.1	-1.1, 7.3	0.14
Generalized anxiety disorder	1.2	-4.4, 6.9	0.67
Panic disorder	-4.1	-9.1, 1	0.11
Posttraumatic stress disorder	8	1.6, 14.3	0.01
Social phobia	4.1	-2.7, 10.9	0.23
Other anxiety disorder	4.7	-0.5, 9.9	0.08
Obsessive-compulsive disorder	4.9	0, 9.8	0.05
Schizophrenia	-8.4	-14, -2.8	0.004
Personality disorders	18.6	13.1, 24.1	< 0.001
Comorbidity			
No psychiatric comorbidities	0 [reference]	...	...
Psychiatric comorbidities	-2.8	-7.1, 1.5	0.2
Medication class			
Antidepressants	-5.5	-7.7, -3.3	< 0.001
Antipsychotics	-6.5	-9.2, -3.8	< 0.001
Mood stabilizers	-1.5	-4.6, 1.6	0.35
Sedative-hypnotics	-4.3	-6.8, -1.8	0.001
Source of payment^b			
Private insurance	0 [reference]	...	...

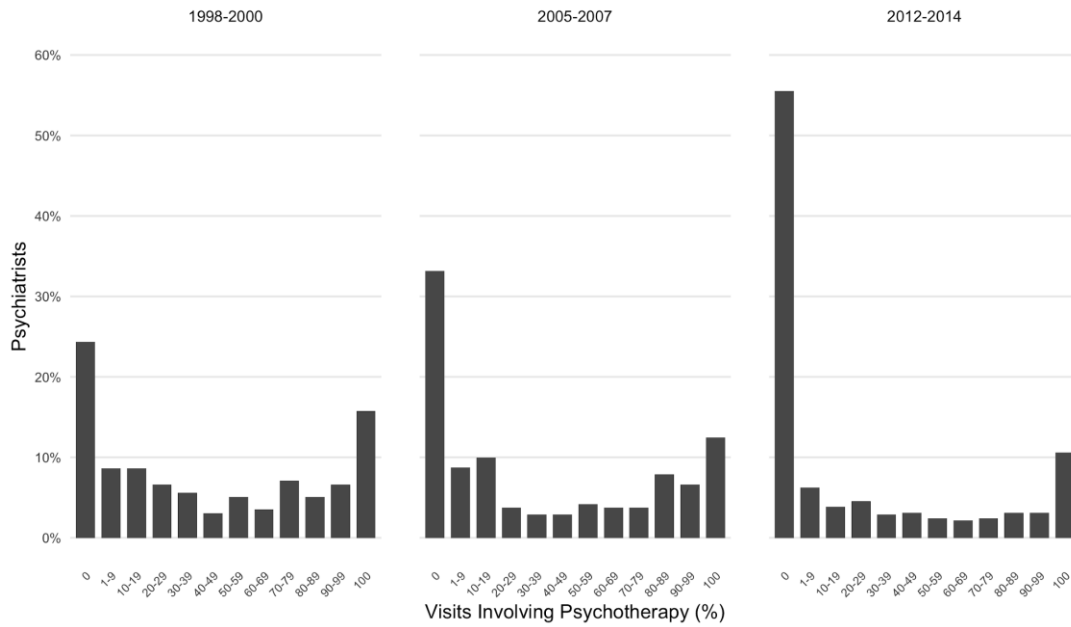
Medicare	-4.1	-8.1, -0.2	0.04
Medicaid	-13.6	-17.1, -10.1	< 0.001
Self-pay	7.2	2.8, 11.5	0.001
Other	0.1	-5.9, 6.2	0.97
Office setting^b			
Freestanding, solo-practice	0 [reference]	...	...
Freestanding, group-practice	-20.5	-25.7, -15.3	< 0.001
HMO or other	-11.1	-17.3, -4.9	< 0.001
Region			
Northeast	0 [reference]	...	...
Midwest	-8.5	-15.2, -1.7	0.01
South	-11.3	-16, -6.6	< 0.001
West	1.3	-4.6, 7.2	0.67
Location			
Metropolitan	0 [reference]	...	...
Nonmetropolitan	-10.8	-18.2, -3.3	0.005
^a Analysis based on weighted visit samples. ^b Data missing for 1996. Data from the National Ambulatory Medical Care Survey (NAMCS) 1996-2016.			

Figure S1. Percentage of psychiatrist visits involving psychotherapy 1996-2016 excluding community mental-health centers^a



^a When excluding community center visits (1.7% of all visits between 1997-2011), the decline in psychotherapy provision persists (Risk Difference=-1%; CI=-1.3%,-0.6%; $p < 0.001$) and the 1996-1997 to 2015-2016 change in percentage of psychotherapy visits stands at 45.7% to 21.6%.

Figure S2. Psychiatrists by percentage of visits involving psychotherapy during three 3-year periods^a



^a Alternative partitioning demonstrates similar trends as the main analysis. Additionally, analyzing the proportion of psychiatrists providing no psychotherapy in any visits weighted at the physician-level (available from 2005) reveals similar trends as the non-weighted analysis. Whereas, of the 12 years of physician-weighted data available, the mean percentage of psychiatrists providing no psychotherapy in 2005-2010 was 34% (CI=29%,39%), in 2011-2016 this share had increased to 51% (CI=45%,56%).