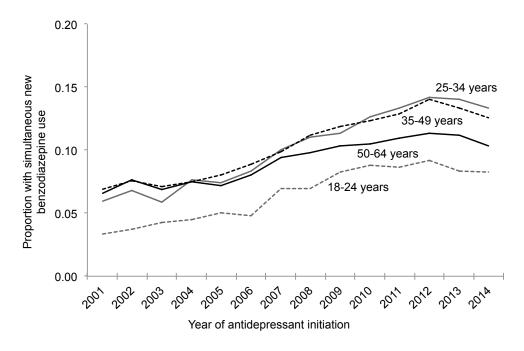
Supplementary Online Content

Bushnell GA, Stürmer T, Gaynes BN, Pate V, Miller M. Simultaneous antidepressant and benzodiazepine new use and subsequent long-term benzodiazepine use in adults with depression, United States, 2001-2014. *JAMA Psychiatry*. Published online June 7, 2017. doi:10.1001/jamapsychiatry.2017.1273

- **eFigure 1.** Proportion of Patients with Simultaneous New Use of an Antidepressant and a Benzodiazepine by Age at Antidepressant Treatment Initiation
- **eFigure 2.** Proportion of Antidepressant and Benzodiazepine Simultaneous New Users Who Became Long-term Benzodiazepine Users
- **eTable 1.** Characteristics of Simultaneous Antidepressant and Benzodiazepine New Users and Non-Simultaneous Antidepressant New Users With Depression and Factors Associated With Simultaneous New Use (Full List of Characteristics)
- **eTable 2.** Details of the Initial Benzodiazepine Prescription Among Antidepressant and Benzodiazepine Simultaneous New Users: Overall and by Selected Physicians
- **eTable 3.** Long-term Benzodiazepine Use Among Simultaneous New Users by Baseline Patient Characteristics and Initial Prescription Details (Full List of Characteristics)

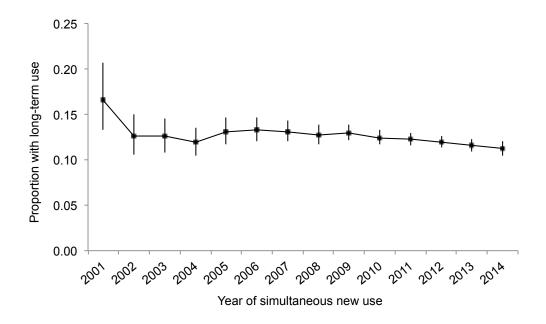
This supplementary material has been provided by the authors to give readers additional information about their work.

eFigure 1. Proportion of Patients With Simultaneous New Use of an Antidepressant and a Benzodiazepine by Age at Antidepressant Treatment Initiation



Proportions internally standardized (reference year=2012) by sex and region; excluded patients with unknown region (remaining n=755,489)

eFigure 2. Proportion of Antidepressant and Benzodiazepine Simultaneous New Users Who Became Long-term Benzodiazepine Users



Error bars represent the 95% CI; Decreasing error bar size related to increasing sample size in the datasource

eTable 1. Characteristics of Simultaneous Antidepressant and Benzodiazepine New Users and Non-Simultaneous Antidepressant New Users With Depression and Factors Associated With Simultaneous New Use (Full List of Characteristics)^a

	Non- Simultaneous		Simultaneous New Use			
	Simultaneous New Users (N=684,110) No. (%)	Simultaneous New Users (N=81,020) No. (%)	Simultaneous New Users, % (95% CI)	Crude RR	Multivariable RR (95% CI)	
Male	231,600 (34)	26,079 (32)	10% (10-10)	REF	REF	
Female	452,510 (66)	54,941 (68)	11% (11-11)	1.07	1.09 (1.08-1.11)	
Age (years), Median (IQR)	39 (29, 49)	39 (30, 49)				
18-24	120,403 (18)	10,140 (13)	8% (8-8)	REF	REF	
25-34	144,620 (21)	19,358 (24)	12% (12-12)	1.52	1.59 (1.56-1.63)	
35-49	249,217 (36)	32,715 (40)	12% (11-12)	1.49	1.68 (1.64-1.71)	
50-64	169,870 (25)	18,807 (23)	10% (10-10)	1.28	1.55 (1.51-1.59)	
Year of antidepressant new use						
2001-2004	66,776 (10)	4,844 (6)	7% (7-7)	0.58	0.66 (0.64-0.68)	
2005-2008	146,587 (21)	14,101 (17)	9% (9-9)	0.75	0.84 (0.82-0.85)	
2009-2012	305,126 (45)	40,426 (50)	12% (12-12)	REF	REF	
2013-2014	165,621 (24)	21,649 (27)	12% (11-12)	0.99	0.92 (0.91-0.94)	
Initial antidepressant class						
SSRI	474,001 (69)	64,460 (80)	12% (12-12)	REF	REF	
SNRI	65,935 (10)	5,554 (7)	8% (8-8)	0.65	0.69 (0.67-0.70)	
Bupropion	86,725 (13)	5,667 (7)	6% (6-6)	0.51	0.57 (0.56-0.59)	
Other	57,449 (8)	5,339 (7)	9% (8-9)	0.71	0.65 (0.63-0.67)	
Depression diagnosis (index diagnosis) ^b						
Not otherwise specified	339,912 (50)	32,443 (40)	9% (9-9)	REF	REF	
Major depressive disorder	178,503 (26)	23,466 (29)	12% (11-12)	1.33	1.40 (1.38-1.43)	
Other	165,695 (24)	25,111 (31)	13% (13-13)	1.51	1.75 (1.72-1.78)	
Inpatient index depression diagnosis	13,144 (2)	2,398 (3)	15% (15-16)	1.47	1.34 (1.29-1.40)	
Non-recent depression diagnosis	161,261 (24)	13,328 (16)	8% (8-8)	0.67	0.71 (0.69-0.72)	
Physician specialty who provided index depression diagnosis						
Family practice	229,862 (34)	27,350 (34)	11% (11-11)	REF	REF	
Psychiatry	86,879 (13)	13,398 (17)	13% (13-14)	1.26	1.32 (1.29-1.35)	
Psychologist, therapist	70,953 (10)	6,673 (8)	9% (8-9)	0.81	0.85 (0.83-0.88)	
Other specialty	234,533 (34)	26,513 (33)	10% (10-10)	0.96	0.98 (0.96-0.99)	
Unknown or multiple physicians	61,883 (9)	7,086 (9)	10% (10-11)	0.97	0.93 (0.91-0.96)	
Anxiety disorder diagnosis, recent						
Unspecified anxiety	52,389 (8)	16,651 (21)	24% (24-24)	2.61	2.58 (2.54-2.62)	
Generalized anxiety disorder	21,350 (3)	5,705 (7)	21% (21-22)	2.07	1.90 (1.85-1.95)	
Panic disorder	4,471 (1)	2,870 (4)	39% (38-40)	3.79	2.67 (2.58-2.76)	
PTSD	4,819 (1)	783 (1)	14% (13-15)	1.32	1.14 (1.05-1.22)	
OCD, phobic disorder, other anxiety	5,910 (1)	1,465 (2)	20% (19-21)	1.89	1.47 (1.40-1.55)	
Non-recent anxiety diagnosis only	23,422 (3)	2,255 (3)	9% (8-9)	0.82	1.11 (1.06-1.15)	
Insomnia or sleep disturbance	39,006 (6)	6,618 (8)	15% (14-15)	1.40	1.31 (1.28-1.34)	

diagnosis, recent					
Psychiatric co-morbidities					
ADHD	20,452 (3)	1,329 (2)	6% (6-6)	0.57	0.63 (0.59-0.66)
Acute reaction to stress	9,030 (1)	1,936 (2)	18% (17-18)	1.68	1.43 (1.37-1.49)
Adjustment disorder ^c	22,968 (3)	3,086 (4)	12% (11-12)	1.12	1.06 (1.02-1.10)
Other episodic mood disorder	7,088 (1)	678 (1)	9% (8-9)	0.82	0.83 (0.78-0.90)
Treated self-harm	861 (<1)	83 (<1)	9% (7-11)	0.83	0.74 (0.59-0.92)
Psychotherapy, recent					
None recorded	529,351 (77)	64,845 (80)	11% (11-11)	REF	REF
≥1 session	154,759 (23)	16,175 (20)	9% (9-10)	0.87	0.83 (0.81-0.85)
Fall, fracture risk factors					
Fracture (excluding skull)	16,079 (2)	1,959 (2)	11% (10-11)	1.03	1.09 (1.04-1.13)
Bone mineral density scan	18,767 (3)	1,908 (2)	9% (9-10)	0.87	0.92 (0.88-0.97)
Osteoporosis	6,464 (1)	647 (1)	9% (8-10)	0.86	0.95 (0.88-1.03)
Cataracts or glaucoma	19,612 (3)	2,014 (2)	9% (9-10)	0.88	0.92 (0.88-0.96)
Visual disturbance/loss	8,803 (1)	980 (1)	10% (9-11)	0.95	0.95 (0.89-1.00)
Poisoning ^d	4,117 (1)	423 (1)	9% (8-10)	0.88	0.84 (0.76-0.92)
Non-psychiatric co-morbidities					
Cardiac dysrhythmias	17,114 (3)	1,985 (2)	10% (10-11)	0.98	0.95 (0.91-1.00)
Cardiac disorders ^e	25,924 (4)	3,173 (4)	11% (11-11)	1.03	1.06 (1.02-1.10)
Chronic kidney disease	3,670 (1)	362 (<1)	9% (8-10)	0.85	0.95 (0.86-1.05)
Osteoarthritis and allied					
disorders	30,654 (4)	3,216 (4)	9% (9-10)	0.89	0.94 (0.91-0.97)
Crohn's disease,	18,352 (3)	2 201 (2)	110/ (11 11)	1.05	1.06 (1.02.1.10)
gastroenteritis	10,332 (3)	2,281 (3)	11% (11-11)	1.05	1.06 (1.02-1.10)
Diabetes	43,589 (6)	4,372 (5)	9% (9-9)	0.85	0.91 (0.88-0.94)
Epilepsy, recurrent seizures	3,458 (1)	321 (<1)	8% (8-9)	0.80	0.80 (0.72-0.89)
Fatigue, malaise	112,920 (17)	11,383 (14)	9% (9-9)	0.84	0.85 (0.84-0.87)
Hearing loss/problem	9,571 (1)	1,014 (1)	10% (9-10)	0.90	0.92 (0.87-0.97)
Hypertension	112,969 (17)	12,640 (16)	10% (10-10)	0.94	0.92 (0.91-0.94)
Hypothyroidism	47,405 (7)	4,941 (6)	9% (9-10)	0.88	0.90 (0.87-0.92)
Overweight, obese	40,729 (6)	4,292 (5)	10% (9-10)	0.89	0.86 (0.84-0.89)
Urinary incontinence	5,125 (1)	515 (1)	9% (8-10)	0.86	0.90 (0.83-0.97)
Outpatient problem-oriented visit, Median (IQR)	4 (2, 6)	3 (2, 6)			
0-1	124,224 (18)	16,077 (20)	11% (11-12)	REF	REF
2-6	399,455 (58)	47,266 (58)	11% (10-11)	0.92	0.94 (0.93-0.96)
>6	160,431 (23)	17,677 (22)	10% (10-10)	0.87	0.91 (0.89-0.93)
Inpatient admission, non-					
psychiatric related	53,321 (8)	5,719 (7)	10% (9-10)	0.91	0.90 (0.87-0.92)
Count of medications by therapeutic group ^f	3 (1, 5)	3 (1, 5)			
0-1	187,505 (27)	22,702 (28)	11% (11-11)	REF	REF
2-6	390,209 (57)	45,863 (57)	11% (10-11)	0.97	1.02 (1.01-1.04)
>6	106,396 (16)	12,455 (15)	10% (10-11)	0.97	1.11 (1.08-1.13)
Opioid prescription, recent	45,916 (7)	6,006 (7)	12% (11-12)	1.10	1.15 (1.12-1.18)
Region	10,010 (1)	0,000 (1)	12/0 (11 12)	1.10	1.10 (1.12 1.10)
Northeast	79,719 (12)	10,466 (13)	12% (11-12)	1.10	1.12 (1.10-1.15)
North Central	192,051 (28)	20,700 (26)	10% (10-10)	0.92	0.99 (0.98-1.01)
South	249,091 (36)	30,291 (37)	11% (11-11)	1.03	1.05 (1.04-1.07)
West	154,927 (23)	18,244 (23)	11% (10-11)	REF	REF
Unknown	8,322 (1)	1,319 (2)	14% (13-14)	1.30	1.28 (1.22-1.35)
OHMHOWH	U,ULL (1)	1,010 (4)	1 + 70 (10-1 4)	1.00	1.20 (1.22-1.00)

Recent refers to measures within 30 days before antidepressant initiation (non-recent: 31-365 days prior); IQR: interquartile range, PTSD: Post traumatic stress disorder, OCD: Obsessive compulsive disorder, ADHD: Attention-deficit/hyperactivity disorder, REF: Reference

deficit/hyperactivity disorder, REF: Reference
^aTable 1 in manuscript is a reduced version of eTable1; Variables removed from full model given independent association with simultaneous new use of 0.952<RR<1.05: Non-recent insomnia/sleep disturbance diagnosis, fall related injury (ICD-

9: E880-E886, E888), fainting/dizziness, gait/lack of coordination, head injury/concussion, dislocation/sprain, other injury, non-psychiatric co-morbidities (anemia, asthma or chronic obstructive pulmonary disease, cerebrovascular disease, gastroesophageal reflux disease, liver disease, migraine/chronic headache, myocardial infarction), psychiatric related inpatient admission

b Index depression diagnosis: other includes adults diagnosed with dysthymic disorder, adjustment disorder with

^bIndex depression diagnosis: other includes adults diagnosed with dysthymic disorder, adjustment disorder with depressed mood, or prolonged depressive reaction; not otherwise specified includes adults without a specific diagnosis ^cExcludes ICD-9 309.0x: Adjustment disorder with depressed mood and 309.1x: Prolonged depressive reaction

^dDefined with ICD-9 codes=960-979 (range for poisoning by drugs, medicinals and biological substances)

^eCardiac disorders defined based on Elixhauser cardiac definition

^fCount of therapeutic group excludes day of antidepressant/benzodiazepine initiation

eTable 2. Details of the Initial Benzodiazepine Prescription Among Antidepressant and Benzodiazepine Simultaneous New Users: Overall and by Selected Physicians

	Simultaneous	Diagnosing provider type ^a		
	new users (N=81,020)	Psychiatry (N=13,398)	Family practice (N=27,350)	Other (N=40,272)
Initial benzodiazepine prescription ^b	No. (%)	No. (%)	No. (%)	No. (%)
Long-acting agent	20,296 (25)	5,019 (37)	5,907 (22)	9,370 (23)
Days supply, median (IQR)	20 (10, 30)	30 (15, 30)	15 (10, 30)	16 (10, 30)
1-7 days	10,913 (13)	896 (7)	4,117 (15)	5,900 (15)
8-21 days	34,064 (42)	3,549 (26)	13,094 (48)	17,421 (43)
22-35 days	34,640 (43)	8,469 (63)	9,880 (36)	16,291 (40)
>35 days	1,399 (2)	484 (4)	258 (1)	657 (2)
Quantity dispensed, median (IQR)	30 (30, 60)	30 (30, 60)	30 (30, 45)	30 (25, 50)
1-24 pills	18,511 (23)	2,046 (15)	6,452 (24)	10,013 (25)
25-50 pills	41,369 (51)	6,062 (45)	14,895 (54)	20,412 (51)
>50 pills	21,136 (26)	5,290 (39)	6,002 (22)	9,844 (24)
Pills-per-day, median (IQR) ^c	2 (1, 3)	2 (1, 3)	2 (1, 3)	2 (1, 3)
1 pill (<1.5)	25,591 (32)	5,088 (38)	7,774 (28)	12,729 (32)
2 pills (1.5 to <2.5)	26,138 (32)	4,837 (36)	8,633 (32)	12,668 (31)
3+ pills (>2.5)	29,287 (36)	3,473 (26)	10,942 (40)	14,872 (37)
Dose-per-day				
Less than modal dose	18,063 (22)	3,768 (28)	5,187 (19)	9,108 (23)
Modal dose	24,425 (30)	4,644 (35)	7,871 (29)	11,910 (30)
Greater than modal dose	38,528 (48)	4,986 (37)	14,291 (52)	19,251 (48)

^aProvider associated with the index depression diagnosis

^bPatients (n=4) with an index benzodiazepine in a solution form missing days supply, quantity, pills-per-day, dose-per-day; Days supply and quantity values ≤0 were set to the median value (30), days supply values >99 were truncated to 100, and quantity values >200 were truncated to 200. For patients with multiple agents (0.9%) if one agent was long-acting they were classified as initiating on a long-acting agent and we defined modal dose based on the highest modal dose-per-day classification

[°]Ranges represent calculated values from quantity dispensed/day supply

eTable 3. Long-term Benzodiazepine Use Among Simultaneous New Users by Baseline Patient Characteristics and Initial Prescription Details (Full List of Characteristics)^a

Male		Non-long term benzodiazepine users (N=54,900)	Long-term benzodiazepine users (N=6,582)	Long-term benzodiazepine use	
Female		No. (%)	No. (%)		
Age (years), median (IQR) 39 (31, 49) 42 (32, 51) EEE	Male	17,091 (31)	2,610 (40)	REF	
18-24	Female	37,809 (69)	3,972 (60)	0.72	0.78 (0.74-0.81)
25-34	Age (years), median (IQR)	39 (31, 49)	42 (32, 51)		
35-49 22,642 (41) 2,753 (42) 1.15 1.15 (1.07-1.25)	18-24	6,806 (12)	706 (11)	REF	REF
12,712 (23)	25-34	12,740 (23)	1,270 (19)	0.96	1.00 (0.92-1.09)
Initial antidepressant class SSR 43,993 (80) 4,855 (74) REF REF SNR 3,661 (7) 607 (9) 1,43 1.19 (1.11-1.29) Bupropion 3,884 (7) 478 (7) 1.10 1.00 (0.91-1.09) Other 3,362 (6) 642 (10) 1.61 1.17 (1.08-1.26) Depression diagnosis (index diagnosis)	35-49	22,642 (41)	2,753 (42)	1.15	1.15 (1.07-1.25)
SSRI 43,993 (80)	50-64	12,712 (23)	1,853 (28)	1.35	1.27 (1.17-1.38)
SNRI 3,661 (7) 607 (9) 1.43 1.19 (1.11-1.29)	Initial antidepressant class				
Bupropion	SSRI	43,993 (80)	4,855 (74)	REF	REF
Other 3,362 (6) 642 (10) 1.61 1.17 (1.08-1.26) Depression diagnosis (index diagnosis) ^b 22,134 (40) 2,203 (33) REF REF Major depressive disorder 15,411 (28) 2,744 (42) 1.67 1.19 (1.12-1.26) Other 17,355 (32) 1,635 (25) 0.95 0.95 (0.90-1.01) Inpatient index depression diagnosis 1,442 (3) 373 (6) 1.97 1.16 (0.99-1.36) Physician specialty who provided index depression diagnosis 18,655 (34) 1,675 (25) REF REF Psychiatry 8,661 (16) 1,884 (29) 2.17 1.37 (1.27-1.47) Psychiatry 18,185 (33) 1,968 (30) 1.19 1.08 (1.02-1.15) Other specialty 1	SNRI	3,661 (7)	607 (9)	1.43	1.19 (1.11-1.29)
Depression diagnosis (index diagnosis)	Bupropion	3,884 (7)	478 (7)	1.10	1.00 (0.91-1.09)
Not otherwise specified 22,134 (40) 2,203 (33) REF REF Major depressive disorder 15,411 (28) 2,744 (42) 1.67 1.19 (1.12-1.26) Other 17,355 (32) 1,635 (25) 0.95 0.95 (0.90-1.01) Inpatient index depression diagnosis 1,442 (3) 373 (6) 1.97 1.16 (0.99-1.36) Physician specialty who provided index depression diagnosis Family practice 18,655 (34) 1,675 (25) REF REF REF Psychiatry 8,661 (16) 1,884 (29) 2.17 1.37 (1.27-1.47) Psychologist, therapist 4,826 (9) 524 (8) 1.19 1.03 (0.94-1.14) Other specialty 18,185 (33) 1,968 (30) 1.19 1.08 (1.02-1.15) Unknown or multiple physicians 4,573 (8) 531 (8) 1.26 1.08 (0.98-1.18) Short vs. long-acting benzodiazepine 41,820 (76) 4,283 (65) REF RE		3,362 (6)	642 (10)	1.61	1.17 (1.08-1.26)
Not otherwise specified 22,134 (40) 2,203 (33) REF REF Major depressive disorder 15,411 (28) 2,744 (42) 1.67 1.19 (1.12-1.26) Other 17,355 (32) 1,635 (25) 0.95 0.95 (0.90-1.01) Inpatient index depression diagnosis 1,442 (3) 373 (6) 1.97 1.16 (0.99-1.36) Physician specialty who provided index depression diagnosis Family practice 18,655 (34) 1,675 (25) REF REF REF Psychiatry 8,661 (16) 1,884 (29) 2.17 1.37 (1.27-1.47) Psychologist, therapist 4,826 (9) 524 (8) 1.19 1.03 (0.94-1.14) Other specialty 18,185 (33) 1,968 (30) 1.19 1.08 (1.02-1.15) Unknown or multiple physicians 4,573 (8) 531 (8) 1.26 1.08 (0.98-1.18) Short vs. long-acting benzodiazepine 41,820 (76) 4,283 (65) REF RE	Depression diagnosis (index diagnosis) ^b				
Other 17,355 (32) 1,635 (25) 0.95 0.95 (0.90-1.01) Inpatient index depression diagnosis 1,442 (3) 373 (6) 1.97 1.16 (0.99-1.36) Physician specialty who provided index depression diagnosis 486 (3) 1,675 (25) REF REF Psychiatry 8,661 (16) 1,884 (29) 2.17 1.37 (1.27-1.47) Psychologist, therapist 4,826 (9) 524 (8) 1.19 1.03 (0.94-1.14) Other specialty 18,185 (33) 1,988 (30) 1.19 1.08 (1.02-1.15) Unknown or multiple physicians 4,573 (8) 531 (8) 1.26 1.08 (0.98-1.18) Short vs. long-acting benzodiazepine ^c 41,820 (76) 4,283 (65) REF REF Short or intermediate-acting 41,820 (76) 4,283 (65) REF REF Long-acting benzodiazepine index days supply ^c 15 (10, 30) 30 (15, 30) 1.61 1.28 (1.22-1.34) Benzodiazepine index days supply ^c 15 (10, 30) 30 (15, 30) 1.54 1.46 (1.30-1.64) 22-3 5 days 22,041 (40) 4,790 (27) 1.54 <t< td=""><td></td><td>22,134 (40)</td><td>2,203 (33)</td><td>REF</td><td>REF</td></t<>		22,134 (40)	2,203 (33)	REF	REF
Inpatient index depression diagnosis	Major depressive disorder	15,411 (28)	2,744 (42)	1.67	1.19 (1.12-1.26)
Physician specialty who provided index depression diagnosis	Other	17,355 (32)	1,635 (25)	0.95	0.95 (0.90-1.01)
depression diagnosis 18,655 (34) 1,675 (25) REF REF Psychiatry 8,661 (16) 1,884 (29) 2.17 1.37 (1.27-1.47) Psychologist, therapist 4,826 (9) 524 (8) 1.19 1.03 (0.94-1.14) Other specialty 18,185 (33) 1,968 (30) 1.19 1.08 (1.02-1.15) Unknown or multiple physicians 4,573 (8) 531 (8) 1.26 1.08 (0.98-1.18) Short vs. long-acting benzodiazepine° 8 531 (8) 1.26 1.08 (0.98-1.18) Short or intermediate-acting 41,820 (76) 4,283 (65) REF REF Long-acting benzodiazepine° 13,080 (24) 2,299 (35) 1.61 1.28 (1.22-1.34) Benzodiazepine index days supply° 15 (10, 30) 30 (15, 30) 30 (15, 30) 1-7 days 7,948 (14) 373 (6) REF REF 8-21 days 24,154 (44) 1,790 (27) 1.54 1.46 (1.30-1.64) 2-35 days 22,041 (40) 4,103 (62) 3.50 2.91 (2.54-3.33) >35 days 756 (1) 316 (5)	Inpatient index depression diagnosis	1,442 (3)	373 (6)	1.97	1.16 (0.99-1.36)
Family practice 18,655 (34) 1,675 (25) REF REF Psychiatry 8,661 (16) 1,884 (29) 2.17 1.37 (1.27-1.47) Psychologist, therapist 4,826 (9) 524 (8) 1.19 1.03 (0.94-1.14) Other specialty 18,185 (33) 1,968 (30) 1.19 1.08 (1.02-1.15) Unknown or multiple physicians 4,573 (8) 531 (8) 1.26 1.08 (0.98-1.18) Short vs. long-acting benzodiazepine* 41,820 (76) 4,283 (65) REF REF Long-acting 13,080 (24) 2,299 (35) 1.61 1.28 (1.22-1.34) Benzodiazepine index days supply* 15 (10,30) 30 (15,30) 30 (15,30) 1-7 days 7,948 (14) 373 (6) REF REF 8-21 days 24,154 (44) 1,790 (27) 1.54 1.46 (1.30-1.64) 22-35 days 22,041 (40) 4,103 (62) 3.50 2.91 (2.54-3.33) >35 days 756 (1) 316 (5) 6.58 4.90 (4.15-5.79) Initial benzodiazepine dose-per-day* 16,303 (30) 2,193 (33)					
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Modal dose 16,303 (30) 2,193 (33) REF REF Greater than modal dose 26,449 (48) 2,864 (44) 0.82 1.12 (1.06-1.18) Initial benzodiazepine quantity dispensed ^c 30 (30, 50) 30 (30, 60) REF REF 25-50 pills 13,171 (24) 767 (12) REF REF 25-50 pills 28,306 (52) 3,252 (49) 1.87 1.18 (1.08-1.29) >50 pills 13,422 (24) 2,563 (39) 2.91 1.14 (1.01-1.27) Anxiety disorder diagnosis, recent 3,443 (6) 529 (8) 1.27 1.16 (1.07-1.25) Panic disorder 1,735 (3) 249 (4) 1.18 1.15 (1.02-1.29)		12 147 (22)	1 505 (22)	0.04	0.00 (0.03 0.05)
Greater than modal dose 26,449 (48) 2,864 (44) 0.82 1.12 (1.06-1.18) Initial benzodiazepine quantity dispensed ^c 30 (30, 50) 30 (30, 60) 30 (30, 60) 1-24 pills 13,171 (24) 767 (12) REF REF 25-50 pills 28,306 (52) 3,252 (49) 1.87 1.18 (1.08-1.29) >50 pills 13,422 (24) 2,563 (39) 2.91 1.14 (1.01-1.27) Anxiety disorder diagnosis, recent Generalized anxiety disorder 3,443 (6) 529 (8) 1.27 1.16 (1.07-1.25) Panic disorder 1,735 (3) 249 (4) 1.18 1.15 (1.02-1.29)					
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1-24 pills 13,171 (24) 767 (12) REF REF 25-50 pills 28,306 (52) 3,252 (49) 1.87 1.18 (1.08-1.29) >50 pills 13,422 (24) 2,563 (39) 2.91 1.14 (1.01-1.27) Anxiety disorder diagnosis, recent Seneralized anxiety disorder 3,443 (6) 529 (8) 1.27 1.16 (1.07-1.25) Panic disorder 1,735 (3) 249 (4) 1.18 1.15 (1.02-1.29)		30 (30, 50)	30 (30, 60)		
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Anxiety disorder diagnosis, recent 529 (8) 1.27 1.16 (1.07-1.25) Panic disorder 1,735 (3) 249 (4) 1.18 1.15 (1.02-1.29)			, , ,		
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Panic disorder 1,735 (3) 249 (4) 1.18 1.15 (1.02-1.29)		3 443 (6)	520 (9)	1 27	1 16 (1 07 1 25)
					· · · · · · · · · · · · · · · · · · ·
	Panic disorder PTSD	496 (1)	75 (1)	1.18	1.08 (0.83-1.39)

OCD, phobic disorder, other anxiety 893 (2) 171 (3) 1.51 Non-recent anxiety diagnosis only 1,500 (3) 212 (3) 1.16 Insomnia or sleep disturbance diagnosis, recent 4,116 (7) 530 (8) 1.07	1.27 (1.10-1.45) 1.10 (0.97-1.25) 1.12 (1.03-1.22)
Insomnia or sleep disturbance diagnosis, recent 4,116 (7) 530 (8) 1.07	
recent 4,116 (7) 530 (8) 1.07	1 12 (1 02 1 22)
recent	
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	,
Non-recent 1,939 (4) 329 (5) 1.37	1.23 (1.11-1.37)
Psychiatric co-morbidities	
ADHD 814 (1) 128 (2) 1.27	1.23 (1.04-1.45)
Acute reaction to stress 1,307 (2) 102 (2) 0.67	0.76 (0.63-0.92)
Adjustment disorder ^d 2,037 (4) 225 (3) 0.93	0.83 (0.71-0.96)
Other episodic mood disorder 426 (1) 75 (1) 1.40	1.10 (0.89-1.35)
Treated self-harm 48 (<1) * *	0.95 (0.52-1.74)
Fall, fracture risk factors	
Fracture (excludes skull) 1,285 (2) 210 (3) 1.32	1.16 (1.02-1.32)
Fall injury ^e 290 (1) 34 (1) 0.98	0.90 (0.66-1.23)
Cataracts or glaucoma 1,331 (2) 168 (3) 1.05	0.92 (0.79-1.06)
Visual disturbance/loss 622 (1) 94 (1) 1.23	1.16 (0.97-1.40)
Poisoning ^e 263 (<1) 65 (1) 1.86	1.29 (1.01-1.64)
Non-psychiatric co-morbidities	· · · · · · · · · · · · · · · · · · ·
Cerebrovascular disease 680 (1) 126 (2) 1.47	1.06 (0.90-1.25)
Chronic kidney disease 236 (<1) 33 (1) 1.15	0.79 (0.57-1.10)
Osteoarthritis and allied disorders 2,037 (4) 344 (5) 1.37	1.13 (1.02-1.26)
Crohn's disease/gastroenteritis 1,475 (3) 218 (3) 1.21	1.12 (0.99-1.27)
Hearing loss/problem 713 (1) 86 (1) 1.01	0.90 (0.74-1.10)
Myocardial infarction 176 (<1) 39 (1) 1.70	1.20 (0.91-1.57)
Overweight, obese 2,743 (5) 290 (4) 0.89	0.85 (0.76-0.95)
Urinary incontinence 338 (1) 36 (1) 0.90	0.84 (0.62-1.14)
Outpatient problem oriented visits	,
median (IQR) 4 (2, 6) 3 (2, 6)	
0-1 10,592 (19) 1,548 (24) REF	REF
2-6 32,327 (59) 3,531 (54) 0.77	0.86 (0.81-0.92)
>6 11,981 (22) 1,503 (23) 0.87	0.83 (0.76-0.90)
Inpatient admission	
Psychiatric-related 1,427 (3) 370 (6) 1.98	1.21 (1.03-1.41)
Non-psychiatric-related 3,801 (7) 503 (8) 1.10	0.93 (0.85-1.02)
Count of medications by therapeutic 3 (1, 5) 3 (1, 6)	
group	
0-1 15,258 (28) 1,845 (28) REF	REF
2-6 31,339 (57) 3,548 (54) 0.94	1.02 (0.96-1.08)
>6 8,303 (15) 1,189 (18) 1.16	1.13 (1.04-1.23)
Opioid prescription, recent 3,723 (7) 773 (12) 1.69	1.50 (1.39-1.61)
Year of simultaneous new use	
2001-2004 3,718 (7) 477 (7) 1.05	0.96 (0.88-1.05)
2005-2008 10,360 (19) 1,350 (21) 1.07	1.01 (0.95-1.07)
2009-2012 28,851 (53) 3,500 (53) REF	REF
2013-2014 11,971 (22) 1,255 (19) 0.88	0.89 (0.84-0.95)
Region	
Northeast 7,039 (13) 849 (13) 1.23	1.17 (1.08-1.27)
North Central 14,092 (26) 1,691 (26) 1.23	1.21 (1.13-1.30)
South 19,917 (36) 2,703 (41) 1.37	1.27 (1.19-1.35)
West 13,039 (24) 1,246 (19) REF	REF
Unknown 813 (1) 93 (1) 1.18	1.03 (0.84-1.25)

Recent refers to measures within 30 days before antidepressant initiation; IQR: interquartile range, PTSD: Post traumatic stress disorder, OCD: Obsessive compulsive disorder, ADHD: Attention-deficit/hyperactivity disorder, REF: Reference *Not displayed due to small number and all number and a reduced version of eTable3; Restricted to patients with 6-months of enrollment (n=61,482);

^aTable 3 in manuscript is a reduced version of eTable3; Restricted to patients with 6-months of enrollment (n=61,482); Variables removed from full model given independent association with long-term use 0.952<RR<1.05: Non-recent depression diagnosis, recent unspecified anxiety diagnosis, recent psychotherapy session, bone mineral density scan,

fainting/dizziness, gait/lack of coordination, osteoporosis, head injury/concussion, dislocation/sprain, other injury, non-psychiatric co-morbidities (anemia, asthma/chronic obstructive pulmonary disease, cardiac dysrhythmia and disorder, gastroesophageal reflux disease, diabetes, epilepsy/recurrent seizures, fatigue/malaise, hypertension, hypothyroidism, liver disease, migraine/chronic headache); One person was excluded from multivariable analysis who initiated on a benzodiazepine in solution form

blindex depression diagnosis: other includes adults diagnosed with dysthymic disorder, adjustment disorder with depressed mood, or prolonged depressive reaction; not otherwise specified includes adults without a specific diagnosis bays supply and quantity values ≤0 were set to the median value (30), days supply values >99 were truncated to 100, and quantity values >200 were truncated to 200. For patients with multiple agents (0.9%) if one agent was long-acting they were classified as initiating on a long-acting agent and we defined modal dose based on the highest modal dose-perday classification

^dExcludes ICD-9 309.0x: Adjustment disorder with depressed mood and 309.1x: Prolonged depressive reaction ^eDefined with ICD-9 codes=960-979 (range for poisoning by drugs, medicinals and biological substances) ^fCount of therapeutic group excludes day of antidepressant/benzodiazepine initiation