Original Research

Antidepressant Use and Lifetime History of Mental Disorders in a Community Sample: Results From the Baltimore Epidemiologic Catchment Area Study

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ABSTRACT

Objective: Past studies have shown that many individuals who use antidepressants have no current or lifetime history of mental disorders. However, recent studies suggest that the one-time retrospective evaluation of mental disorders commonly used in such studies may substantially underestimate the true lifetime prevalence of mental disorders. We examined the prevalence of mental disorders, assessed prospectively over multiple interviews, among individuals currently using antidepressants in a community sample.

Method: Using data from the Baltimore Epidemiologic Catchment Area (ECA) Study Wave 1 (1981) through Wave 4 (2004–2005) (N = 1,071), we assessed lifetime prevalence of common mood and anxiety disorders according to *DSM-III* and *DSM-III-R* criteria, based on 4 interviews, among participants who reported current antidepressant use. Furthermore, we examined factors associated with current antidepressant use.

Results: Thirteen percent of participants at Wave 4 reported currently using antidepressant medications. Among antidepressant users, 69% never met criteria for major depressive disorder (MDD); and 38% never met criteria for MDD, obsessive-compulsive disorder, panic disorder, social phobia, or generalized anxiety disorder in their lifetime. Female gender, Caucasian ethnicity, recent or current physical problems (eg, loss of bladder control, hypertension, and back pain), and recent mental health facility visits were associated with antidepressant use in addition to mental disorders.

Conclusions: Many individuals who are prescribed and use antidepressant medications may not have met criteria for mental disorders. Our data indicate that antidepressants are commonly used in the absence of clear evidence-based indications.

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Corresponding author: Yoichiro Takayanagi, MD, PhD, Department of Mental Health, Johns Hopkins Bloomberg School of Public Health, 624 North Broadway, Baltimore, MD 21205 (ytakayan@jhsph.edu; ytakayan1@gmail.com). A ntidepressant prescribing and use have increased rapidly in the past 2 decades.¹⁻³ The introduction of new agents, such as selective serotonin reuptake inhibitors (SSRIs) and serotonin and norepinephrine reuptake inhibitors (SNRIs), which are better tolerated than the older tricyclic antidepressants (TCAs), has contributed to the rapid rise in antidepressant prescription.²

The rise in prescription and use of antidepressants has coincided with increased numbers of individuals using these medications who do not meet criteria for mental disorders^{4–6} and who may suffer from mild mood or anxiety symptoms.⁷ Recent studies suggest that up to 73% of antidepressant users may lack a psychiatric diagnosis.⁶ There is some evidence that this potential antidepressant use without an indicated mental disorder diagnosis may be more pronounced in some population subgroups, including females,⁸⁻¹¹ older adults,^{8,10} whites,² and individuals with physical health problems.^{8,9,11} Furthermore, some of the individuals who continue to use antidepressants on a long-term basis might have met the criteria for a mental disorder in the remote past. While long-term maintenance antidepressant treatment may be indicated in some of these individuals,¹² long-term use of these medications is not always indicated. Unnecessary longterm antidepressant use may expose individuals to increased risks of adverse effects ranging from severe health risks, such as suicidality,¹³ to problems affecting quality of life,¹⁴ such as sexual dysfunction as well as unnecessary financial burden.

Past studies that examined antidepressant use without an indicated mental disorder diagnosis often have used one-time retrospective evaluation of current or lifetime mental disorders.^{4–6} Retrospective evaluations may substantially underestimate the true lifetime prevalence of mental disorders, as noted in a recent study that compared one-time retrospective evaluations with cumulative evaluations based on repeated interviews over time.¹⁵ In that study by Moffitt et al,¹⁵ the lifetime prevalence estimates based on prospective evaluation using multiple interviews were typically 2–3 times higher than those based on one-time retrospective evaluations. Underestimation of prevalence of mental disorders may have influenced the results of previous studies that examined whether those receiving antidepressant treatment actually met diagnostic criteria for mental disorders.^{4–6}

In the current study, we used data from the Baltimore Epidemiologic Catchment Area (ECA) Follow-Up Study Waves 1 (1981) through 4 (2004–2005) to assess the proportion of antidepressant use in the community that is not associated with a lifetime history of common mental disorders, ascertained by cumulative evaluation over 4 waves. We also explored sociodemographic and other clinical factors associated with antidepressant use in this community sample.

- One-time retrospective evaluation of mental disorders commonly used in surveys could substantially underestimate the true lifetime prevalence of mental disorders.
- Many individuals who are prescribed and use antidepressant medications may not have met criteria for mental disorders, even when these disorders are evaluated prospectively.
- Antidepressants are commonly used in the absence of clear evidence-based indications.

METHOD

Sample

The Baltimore ECA Follow-Up Study is a longitudinal, population-based cohort study of adult participants. The participants were originally interviewed in 1981 (Wave 1, N = 3,481) and followed up in 1982 (Wave 2, N = 2,768), 1993–1996 (Wave 3, N=1,920), and 2004–2005 (Wave 4, N = 1,071). The Baltimore ECA Follow-Up Study was primarily designed to collect data to estimate the prevalence and incidence of mental disorders in a representative community sample according to the criteria of the Diagnostic and Statistical Manual of Mental Disorders, Third Edition (DSM-III, for Waves 1 and 2) or its revised edition (DSM-III-R, for Waves 3 and 4). Methods for the Baltimore ECA Follow-Up Study have been described in detail elsewhere.¹⁶ The study was approved by the Johns Hopkins Bloomberg School of Public Health Institutional Review Board. All participants provided written informed consent.

Assessments

Antidepressant use at Wave 4 was assessed by asking participants to list all of the medications they had taken in the past week. They were instructed to include both prescribed and over-the-counter medications. The interviewer recorded the names of all medications. For this study, 2 experienced psychiatrists (Y.T. and O.J.B.) independently coded all antidepressant drugs recorded by lay-interviewers including amitriptyline, bupropion, citalopram, clomipramine, doxepin, duloxetine, escitalopram, fluoxetine, fluvoxamine, imipramine, mirtazapine, nortriptyline, paroxetine, sertraline, trazodone, and venlafaxine. A high interrater reliability was obtained between the 2 raters (Cohen $\kappa = 0.99$).

Cumulative lifetime history of mental disorders was assessed based on interviews in Waves 1 through 4 using the Diagnostic Interview Schedule (DIS).¹⁷ At each Wave, trained interviewers administered the DIS. In Waves 1 and 2, the DIS version III¹⁸ (based on *DSM-III* criteria) was used; in Waves 3 and 4, the DIS version III-R¹⁹ (based on *DSM-III-R* criteria) was used. At each Wave, lifetime history of the following 7 mental disorders was evaluated: major depressive disorder (MDD), obsessive-compulsive disorder (OCD), panic disorder, social phobia, generalized anxiety disorder (GAD), alcohol abuse or dependence, and drug (including cocaine, marijuana, stimulants, sedatives, and tranquilizers) abuse or dependence. Lifetime prevalence of mental disorders was estimated using the assessments of lifetime disorders at each wave over Waves 1 through 4. However, GAD was evaluated only at Waves 3 and 4. We therefore estimated the lifetime prevalence of GAD solely based on data from Waves 3 and 4. Participants were rated as having a lifetime history of a mental disorder if they met the criteria for that disorder at least once over the course of the 4 interviews.

Cumulative lifetime history of medical disorders was estimated using the assessments of lifetime history of these disorders at each wave over Waves 1 through 4. Participants were asked if they ever had the following physical illnesses: diabetes, hypertension, arthritis, stroke, and cancer (any type).

Somatic symptoms were assessed at the Wave 4 interview by asking each participant if they ever had the following somatic symptoms: back pain, loss of bladder control, fainting spells, and dizziness.

Sociodemographic characteristics included in the analyses were based on Wave 4 data and included age (categorized here into 4 groups: \leq 49, 50–59, 60–69, and \geq 70 years), sex, race (non-Hispanic Caucasian vs other racial/ethnic group, including African American, Hispanic, Asian American, Native American, and Pacific Islander), educational attainment (less than 12 years [less than high school] vs \geq 12 years of school [high school or more]), and marital status (currently married vs not married). Mental health service use (at least 1 visit within the 6-month period prior to the Wave 4 interview vs no visits within the past 6 months) and coverage by Medicare or other health insurance at Wave 4 interview were also recorded.

Statistical Analysis

We calculated the cumulative lifetime prevalence of MDD or any of the covered anxiety disorders among the Wave 4 antidepressant users. Multivariable logistic regression analysis was used to identify factors associated with the binary outcome of current antidepressant use, recorded at Wave 4. Mental disorders, medical disorders, somatic symptoms at Wave 4 interview, sociodemographic variables, and mental health service use were entered as independent variables in the models. We first calculated unadjusted odds ratios. Next, for mental disorders, medical disorders, somatic symptoms, and mental-health service use, we calculated odds ratios adjusted for sex and race (Caucasian vs other racial/ethnic group). We limited the covariates to sex and race based on the results of the unadjusted analysis. Statistical analyses were carried out using SPSS software version 20 (IBM, Chicago, Illinois).

RESULTS

Characteristics and Antidepressant Use in Baltimore ECA Wave 4 Participants

Participants had a mean (\pm SD) age of 58.9 (\pm 12.9) years at Wave 4, and the majority of participants were 50 years old or older. Approximately 63% were female, 62% were

Table 1. Characteristics of 1,071 Participants of Wave 4 Baltimore Epidemiologic Catchment Area Study and	
Comparison of Antidepressant Users and Nonusers	

					Al	C	Unadjusted Comparison of AD Users and Nonusers			Adjusted Comparison of AD Users and Nonusers ^a		
	Total		AD Users		Nonusers		95% CI			95% CI		
Characteristic	N	%	n	%	n	%	OR	Lower	Upper	OR	Lower	Upper
Age at Wave 4, y												
< 50	271	25	32	23	239	26	1 (ref)					
50-59	402	38	58	42	344	37	1.26	0.79	2.00			
60–69	182	17	21	15	161	17	0.97	0.54	1.75			
≥70	216	20	26	19	190	20	1.02	0.59	1.77			
Gender (female)	674	63	107	78	567	61	2.31*	1.51	3.53			
Race (non-Caucasian)	409	38	31	23	378	41	0.43*	0.28	0.66			
Marital status (married)	581	56	74	54	507	56	0.91	0.64	1.31			
Education attainment $(\geq 12 \text{ y})$	779	73	99	72	680	73	0.97	0.65	1.45			
Covered by Medicare	368	34	50	37	318	34	1.11	0.77	1.62			
Covered by health insurance	834	78	99	72	735	79	0.71	0.47	1.06			
Lifetime history of mental illness												
MDD	140	13	43	31	97	10	3.95*	2.60	5.99	3.46*	2.26	5.29
OCD	76	7	16	12	60	6	1.93*	1.07	3.45	1.75	0.97	3.18
Panic disorder	72	7	28	20	44	5	5.20*	3.11	8.69	4.26*	2.52	7.21
Social phobia	271	25	51	37	220	24	1.93*	1.32	2.81	1.97*	1.34	2.89
GAD ^b	37	4	13	10	24	3	3.98*	1.97	8.01	3.48*	1.69	7.17
Alcohol abuse or dependence	277	26	42	31	235	25	1.32	0.89	1.95	1.94*	1.26	2.99
Drug abuse or dependence	188	18	32	23	156	17	1.52	0.99	2.34	1.82*	1.16	2.84
MDD or any anxiety disorders	412	39	85	62	327	35	3.03*	2.10	4.39	2.86*	1.96	4.17
Lifetime history of medical illness												
Diabetes	216	20	31	23	185	20	1.18	0.77	1.82	1.22	0.79	1.90
Hypertension	593	55	87	64	506	54	1.47^{*}	1.02	2.13	1.57*	1.07	2.29
Arthritis	578	54	85	62	493	53	1.46^{*}	1.01	2.11	1.36	0.94	1.99
Stroke	77	7	17	12	60	6	2.06*	1.17	3.65	1.95*	1.09	3.50
Cancer	112	11	16	2	96	10	1.15	0.66	2.03	0.92	0.52	1.63
Somatic symptoms												
Back pain	383	36	74	54	309	33	2.38*	1.65	3.41	2.33*	1.61	3.37
Loss of bladder control	246	23	49	36	197	21	2.08*	1.42	3.06	1.77*	1.18	2.63
Fainting spells	75	7	16	12	59	6	1.96*	1.09	3.52	2.09*	1.15	3.80
Dizziness	209	20	52	38	157	17	3.03*	2.06	4.45	2.90*	1.95	4.30
Mental health visit in past 6 mo	129	12	66	48	63	7	12.62*	8.28	19.23	11.83*	7.68	18.22

^aAdjusted for gender and race.

^bEvaluated only at Waves 3 and 4.

**P*<.05.

Abbreviations: AD = antidepressant, CI = confidence interval, GAD = generalized anxiety disorder, MDD = major depressive disorder,

OCD = obsessive-compulsive disorder, OR = odds ratio, ref = reference value.

Caucasian (35% were African American, and 3% were of another race/ethnicity), 56% were married at the time of Wave 4 interview, and 73% had educational attainments of \geq 12 years (Table 1). Of 1,071 participants, 137 (13%) were taking antidepressants at the time of the Wave 4 interview. Among the 137 antidepressant users, 94 (69%) never met criteria for MDD, and 52 (38%) never met criteria for MDD or the anxiety disorders evaluated in this study (ie, OCD, panic disorder, social phobia, and GAD) in any of the 4 interviews. Of the 1,071 participants, 129 (12%) had used mental health services within 6 months prior to the Wave 4 interview.

Comparison of Antidepressant Users and Nonusers

In unadjusted analyses, female gender; Caucasian race; having a lifetime history of MDD, OCD, panic disorder, social phobia, GAD, hypertension, arthritis, or stroke; reporting a lifetime history of back pain, loss of bladder control, fainting spells, or dizziness; and having a mental health visit in the past 6 months were associated with antidepressant use. When adjusted for sex and race, lifetime histories of all mental disorders but OCD were associated with antidepressant use. Recent or lifetime histories of hypertension, stroke, back pain, loss of bladder control, fainting spells, and dizziness also remained significantly associated with antidepressant use. The association of antidepressant use with a mental health visit in the past 6 months persisted in the adjusted analysis (Table 1).

DISCUSSION

To our knowledge, this is the first study that has examined antidepressant use and lifetime prevalence of mental disorders ascertained by cumulative evaluation using multiple interviews in a community sample. We found that a sizable proportion of antidepressant use was not associated with lifetime mental disorder history, with 38% of current antidepressant users never having met criteria for MDD, OCD, panic disorder, social phobia, or GAD; and 69% of current antidepressant users never having met the criteria for MDD in their lifetimes. Because we used cumulative evaluation based on 4 interviews, the lifetime prevalence estimates of mental disorders are quite likely closer to the true lifetime prevalence of these mental disorders than the estimates based on one-time retrospective evaluation. Nonetheless, like past studies,⁴⁻⁶ we found that a substantial proportion of antidepressant users do not have a history of meeting criteria for MDD or the anxiety disorders assessed, even when these disorders are evaluated by a cumulative approach. Our data thus support the view that antidepressants are commonly prescribed for patients who may have mild psychiatric symptoms but do not meet the full criteria for depression or other common mental disorders for which these medications are indicated.

Past studies have found that 20%–30% of antidepressant prescriptions are prescribed for off-label indications.^{20,21} Furthermore, prescriptions written by nonpsychiatrist physicians have been growing¹; based on 1 estimate, 60% of antidepressant prescriptions in this country are written by such providers.²² Although the majority of these medications are prescribed for depression or anxiety complaints,^{4,23,24} many of these complaints may not meet the diagnostic criteria for conditions for which there is strong empirical evidence of antidepressant treatment efficacy and safety. Moreover, as the results of the current study indicate, many patients who are prescribed antidepressants may never have met these criteria throughout their lifetimes.

Consistent with past research,^{8,9,11} medical illnesses and somatic complaints were associated with antidepressant use. It might be the case that associations between physical complaints or illnesses and antidepressant use are explained by access to primary care physicians by individuals with chronic medical conditions. Individuals who are in frequent contact with their primary care providers due to physical health conditions may simply have a greater chance of receiving antidepressant treatment.

Food and Drug Administration (FDA)-approved uses of antidepressants for nonpsychiatric conditions such as premenstrual dysphoric disorder (PMDD), fibromyalgia, and chronic pain or for smoking cessation and off-label indications might partly explain the substantial proportion of antidepressant users without lifetime histories of MDD or anxiety disorders. However, we note that other studies have found that only a small proportion of antidepressants are prescribed for these conditions. In a 2010 study based on a survey of a nationally representative sample of practices, no more than 7% of antidepressant prescriptions were for physical health conditions.²³ Less than 2% of all antidepressant prescriptions were for the diagnostic groups that include fibromyalgia and PMDD. Thus, the majority of the prescriptions in the absence of psychiatric diagnoses of MDD and anxiety disorders in this study were likely for mental health complaints that did not meet the criteria for these disorders. While there is some evidence supporting the efficacy of antidepressants for subsyndromal depressive symptoms and dysthymic disorder,^{25,26} and for off-label use of antidepressants in the treatment of sleep disorders,²⁷ these uses are controversial.^{28,29}

Several limitations to this study should be noted. First, the ECA study used different versions of DSM criteria for Waves 1–2 and Waves 3–4. Second, we were unable to include a number of other indicated uses of antidepressants,

including bipolar disorder and posttraumatic stress disorder (PTSD), because these disorders were not evaluated in Waves 3 and 4 (bipolar disorder) or were not accessed at any waves (PTSD). In addition, GAD was not evaluated in Waves 1 and 2. Therefore we might have overestimated antidepressant use without an indicated mental disorder diagnosis in this community sample. However, the lifetime prevalence of bipolar spectrum disorders in Waves 1 and 2 was very low (less than 1%, even when Waves 1 and 2 were combined), and all subjects (n=9) who met the criteria of bipolar disorder at Waves 1 or 2 also had a lifetime history of MDD or anxiety disorders evaluated in this study. Third, as evidenced by this study and others, antidepressant use without an indicated mental disorder diagnosis occurs in conjunction with underdiagnosis and undertreatment of major depression and other common mood and anxiety disorders in community settings.³⁰ While we were able to estimate how many people without lifetime mental disorders used antidepressants, we were unable to estimate how many people with lifetime disorders had ever used any antidepressant. Fourth, because the information regarding current antidepressant use was based on participant selfreport, reporting bias may have influenced the results. Fifth, because no measures for the severity of mental disorders were available, we did not examine the relationship between the severity of symptoms of MDD or anxiety disorders and antidepressant use. Past studies have shown that the benefit from antidepressants varies depending on the severity of symptoms (ie, patients with more severe symptoms receive greater benefits).^{31,32} Sixth, we were unable to identify whether the antidepressants were prescribed by primary care provider or psychiatrists. The high prevalence of false positive diagnoses of depression in primary care has been previously documented.³³ The prevalence of prescriptions without a diagnosis may be higher among patients of primary care providers. Finally, lifetime history of a mental disorder is not by itself an indication for use of antidepressants. Many of the patients with a positive lifetime history of MDD or other episodic mental disorders recover from these disorders on their own. Practice guidelines for treatment of mental disorders recommend long-term treatment only for patients who experience repeated episodes or severe and disabling illness.¹² Furthermore, while the assessment of mental disorders in this study was based on lifetime history and consecutive interviews, assessment of antidepressant use was based on interviews in Wave 4 only and solely covered current use. Assessment of lifetime antidepressant use would most likely reveal a larger number of antidepressant users without a lifetime major depression or anxiety disorder diagnosis.

In conclusion, our data add to the accumulating literature on the use of antidepressants in the absence of clear evidence-based psychiatric indications. The findings call for broad reforms, including improved communication and referral between primary care providers and psychiatrists, education of primary care providers on appropriate use of antidepressants, and possibly selective use of screening measures to enhance the match between the diagnosis of common mental disorders and antidepressant treatment.³⁴ With the expected expansion in the role of primary care providers in diagnosis and management of common mental disorders following the implementation of the Affordable Care Act, there is an urgent need for initiatives aimed at improving the diagnosis and treatment of these disorders in primary care settings.⁶

Drug names: bupropion (Wellbutrin, Aplenzin, and others), citalopram (Celexa and others), clomipramine (Anafranil and others), doxepin (Silenor and others), duloxetine (Cymbalta), escitalopram (Lexapro and others), fluoxetine (Prozac and others), fluvoxamine (Luvox and others), mipramine (Tofranil and others), mirtazapine (Remeron and others), nortriptyline (Pamelor, Aventyl, and others), paroxetine (Paxil, Pexeva, and others), sertraline (Zoloft and others), trazodone (Oleptro and others), venlafaxine (Effexor and others).

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REFERENCES

- Mojtabai R. Increase in antidepressant medication in the US adult population between 1990 and 2003. *Psychother Psychosom*. 2008;77(2):83–92.
- Olfson M, Marcus SC. National patterns in antidepressant medication treatment. Arch Gen Psychiatry. 2009;66(8):848–856.
- Ilyas S, Moncrieff J. Trends in prescriptions and costs of drugs for mental disorders in England, 1998–2010. Br J Psychiatry. 2012;200(5):393–398.
- Mojtabai R, Olfson M. National patterns in antidepressant treatment by psychiatrists and general medical providers: results from the national comorbidity survey replication. J Clin Psychiatry. 2008;69(7):1064–1074.
- Pagura J, Katz LY, Mojtabai R, et al. Antidepressant use in the absence of common mental disorders in the general population. J Clin Psychiatry. 2011;72(4):494–501.
- Mojtabai R, Olfson M. Proportion of antidepressants prescribed without a psychiatric diagnosis is growing. *Health Aff (Millwood)*. 2011;30(8):1434–1442.
- Jureidini J, Tonkin A. Overuse of antidepressant drugs for the treatment of depression. CNS Drugs. 2006;20(8):623–632.
- Demyttenaere K, Bonnewyn A, Bruffaerts R, et al. Clinical factors influencing the prescription of antidepressants and benzodiazepines: results from the European study of the epidemiology of mental disorders (ESEMeD). J Affect Disord. 2008;110(1–2):84–93.
- Zhang Y, Chow V, Vitry AI, et al. Antidepressant use and depressive symptomatology among older people from the Australian Longitudinal Study of Ageing. *Int Psychogeriatr.* 2010;22(3):437–444.
- Parabiaghi A, Franchi C, Tettamanti M, et al. Antidepressants utilization among elderly in Lombardy from 2000 to 2007: dispensing trends and

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appropriateness. Eur J Clin Pharmacol. 2011;67(10):1077-1083.

- Carrasco-Garrido P, López de Andrés A, Hernández Barrera V, et al. National trends (2003–2009) and factors related to psychotropic medication use in community-dwelling elderly population. *Int Psychogeriatr.* 2013;25(2):328–338.
- 12. American Psychiatric Association. *Practice Guideline for the Treatment of Patients With Major Depressive Disorder*. 3rd ed. Washington, DC: American Psychiatric Association; 2010.
- Stone M, Laughren T, Jones ML, et al. Risk of suicidality in clinical trials of antidepressants in adults: analysis of proprietary data submitted to US Food and Drug Administration. *BMJ*. 2009;339:b2880.
- Goldstein BJ, Goodnick PJ. Selective serotonin reuptake inhibitors in the treatment of affective disorders—III: tolerability, safety and pharmacoeconomics. J Psychopharmacol. 1998;12(suppl B):S55–S87.
- Moffitt TE, Caspi A, Taylor A, et al. How common are common mental disorders? evidence that lifetime prevalence rates are doubled by prospective versus retrospective ascertainment. *Psychol Med.* 2010;40(6):899–909.
- Eaton WW, Kalaydjian A, Scharfstein DO, et al. Prevalence and incidence of depressive disorder: the Baltimore ECA follow-up, 1981–2004. Acta Psychiatr Scand. 2007;116(3):182–188.
- Robins LN, Helzer JE, Croughan J, et al. National institute of mental health diagnostic interview schedule. its history, characteristics, and validity. *Arch Gen Psychiatry*. 1981;38(4):381–389.
- Robins LN, Helzer JE, Croughan J, et al. NIMH Diagnostic Interview Schedule: Version III. St Louis, MO: Washington University School of Medicine; 1981.
- Robins L. NIMH Diagnostic Interview Schedule: Version III Revised (DIS-III-R). St Louis, MO: Washington University School of Medicine; 1989.
- Conti R, Busch AB, Cutler DM. Overuse of antidepressants in a nationally representative adult patient population in 2005. *Psychiatr Serv*. 2011;62(7):720–726.
- Eguale T, Buckeridge DL, Winslade NE, et al. Drug, patient, and physician characteristics associated with off-label prescribing in primary care. Arch Intern Med. 2012;172(10):781–788.
- Mark TL, Levit KR, Buck JA. Datapoints: psychotropic drug prescriptions by medical specialty. *Psychiatr Serv*. 2009;60(9):1167.
- Mark TL. For what diagnoses are psychotropic medications being prescribed? a nationally representative survey of physicians. CNS Drugs. 2010;24(4):319–326.
- Samples H, Mojtabai R. Antidepressant use in the European union: perceived indications and patterns. *Psychiatr Serv*. 2013;64(3):208.
- Levkovitz Y, Tedeschini E, Papakostas GI. Efficacy of antidepressants for dysthymia: a meta-analysis of placebo-controlled randomized trials. J Clin Psychiatry. 2011;72(4):509–514.
- von Wolff A, Hölzel LP, Westphal A, et al. Selective serotonin reuptake inhibitors and tricyclic antidepressants in the acute treatment of chronic depression and dysthymia: a systematic review and meta-analysis. J Affect Disord. 2013;144(1–2):7–15.
- Bossini L, Casolaro I, Koukouna D, et al. Off-label uses of trazodone: a review. Expert Opin Pharmacother. 2012;13(12):1707–1717.
- Barbui C, Cipriani A, Patel V, et al. Efficacy of antidepressants and benzodiazepines in minor depression: systematic review and meta-analysis. Br J Psychiatry. 2011;198(1):11–16, 1.
- Hegerl U, Schönknecht P, Mergl R. Are antidepressants useful in the treatment of minor depression: a critical update of the current literature. *Curr Opin Psychiatry*. 2012;25(1):1–6.
- Mojtabai R. Unmet need for treatment of major depression in the United States. *Psychiatr Serv*. 2009;60(3):297–305.
- Fournier JC, DeRubeis RJ, Hollon SD, et al. Antidepressant drug effects and depression severity: a patient-level meta-analysis. JAMA. 2010;303(1):47–53.
- 32. Mojtabai R. The public health impact of antidepressants: an instrumental variable analysis. *J Affect Disord*. 2011;134(1–3):188–197.
- Mitchell AJ, Vaze A, Rao S. Clinical diagnosis of depression in primary care: a meta-analysis. *Lancet*. 2009;374(9690):609–619.
- 34. Mojtabai P. Does depression screening have an effect on the diagnosis and treatment of mood disorders in general medical settings? an instrumental variable analysis of the national ambulatory medical care survey. *Med Care Res Rev.* 2011;68(4):462–489.