

# National Rates and Patterns of Depression Screening in Primary Care: Results From 2012 and 2013

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**Objectives:** Despite high prevalence rates of depression in primary care, depressive symptoms are often undetected by physicians. Screening for depression is now recommended as a part of routine primary care; however, recent estimates of rates and patterns of depression screening are lacking in the literature. This study examined national rates and patterns of depression screening among visits to office-based primary care physicians.

**Methods:** A secondary analysis of data from the 2012 and 2013 National Ambulatory Medical Care Survey was conducted. The sample consisted of 33,653 physician-patient encounters.

**Results:** The overall rate of depression screening was 4.2%. African Americans were half as likely to be screened compared with whites, and elderly patients were half as likely to be screened compared with middle-aged patients. Patients

with a chronic condition were more likely than patients without a chronic condition to receive depression screening, and the likelihood of being screened increased with each additional chronic condition. Providers who had fully adopted electronic health records (EHRs) were more likely to screen for depression compared with providers who used paper charts. Screening rates were not associated with providers' intentions to participate in the federal program that provides financial incentives for the meaningful use of certified EHRs.

**Conclusions:** Overall rates of depression screening were low. Current screening practices may exacerbate existing disparities in depression care. EHR systems may be an effective tool to improve screening rates.

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Depression is a major cause of disability worldwide (1) and is associated with a number of adverse outcomes, including increased risk of self-harm (2,3), premature mortality (4), and the development of comorbid general medical conditions (5,6), such as heart disease, stroke, and obesity (7). Epidemiological studies estimate the 12-month prevalence of major depression among adults to be between 4% and 8% (4,8). Between 13% and 16% of adults may experience depressive symptoms during the course of their lifetime (9,10).

Treatment with antidepressants (11,12) or psychotherapy (13,14) can improve symptoms and mitigate adverse outcomes; however, linking patients to care necessarily requires accurate and timely detection of depression by a qualified medical or mental health provider. Primary care settings are an opportune location for timely identification of depression, given that individuals experiencing symptoms of depression are more likely to encounter a primary care provider rather than a behavioral health professional (15). The modal prevalence of depression within primary care has been estimated at 8% to 14% (8), and up to 45% of individuals who died by suicide had contact with primary care providers within one month of suicide (16).

Although primary care providers are able to accurately diagnose depression when symptoms are recognized (8,17–19), data suggest that depression goes undetected about half the time it is present (8,19), with some estimates of recognition as low as 36.4% (17). Diagnosis and treatment rates in primary care are particularly low for certain populations, including African Americans (20), older adults, and males (21–24). Failure to diagnose depression may be attributed, in part, to lack of screening in primary care, given that the proportion of the general primary care population who receive depression screening in the United States has been estimated to be between 1% and 2% (25–27).

Although routine depression screening in primary care has been recommended for some time (28), inadequate reimbursement and difficulty integrating screening into existing clinical work flows have been documented as barriers to universally adopting this practice (29–31). However, since the last time national rates of primary care depression screening were explored, important policy and system-level changes have occurred that may mitigate the effect of these obstacles. Prior to 2010, screening for depression and other mental illnesses was not a standard billable service (31), which may have discouraged providers from prioritizing this

practice. Regulations put in place by the 2010 Affordable Care Act require private insurers to pay for recommended preventive screening tests, including those for depression (32). In 2011, the Centers for Medicare and Medicaid Services also announced reimbursement of annual depression screening for Medicare beneficiaries (33). Because of expanded opportunities to receive payment for the delivery of screening services, it is possible that rates of depression screening may have increased.

In addition, depression screening is increasingly included as a standard-of-care measure in emerging models of primary care. Routine depression screening for adults was added as a core quality measure in both the 2011 patient-centered medical home (34) and the 2012 accountable care organization (35) standards. In addition to establishing frameworks for clinical work flows that include depression screening, these programs also provide opportunities to expand financial support of this practice beyond the recently approved fee-for-service options. As a growing number of primary care practices adopt these models of care, depression screening may become better integrated into routine practice.

Last, adoption of electronic health records (EHRs) has increased dramatically over the past several years (36). Consequently, an increasing number of health care providers are equipped with computerized support tools that are explicitly designed to help health professionals comply with recommended clinical guidelines. Clinical decision support systems (CDSS), a common feature of EHR systems, provide users with automated prompts when specified tests or screenings are indicated. A recent systematic review of research exploring the impact of CDSS on depression care yielded primary positive results (37), although only two of the included trials (38,39) specifically explored depression screening. Notably, these results indicated that using CDSS can increase the number of individuals screened for depression. Notably, these study populations were limited to patients in behavioral health programs (38,39) and certain high-risk primary care patients (39), leaving the effect of CDSS on screening rates within general primary care population largely unknown.

Debate continues around the impact of routine screening on depression care outcomes (40,41). In 2016, the U.S. Preventive Services Task Force reaffirmed its recommendation for routine depression screening in primary care on the grounds that ample evidence supports the benefits of this practice (42).

Given that significant policy and system-level developments related to depression care have been put into place, more recent national estimates of depression screening are needed. The purpose of this study was to use the National Ambulatory Medical Care Survey (NAMCS) to examine rates and patterns of depression screening in primary care settings in 2012 and 2013.

## METHODS

### Data

NAMCS is an ongoing annual survey conducted by the National Center for Health Statistics describing visits to U.S.

physicians providing office-based patient care. The unit of observation is the physician-patient encounter. Data are collected by using a multistage probability sample of visits, yielding nationally representative estimates of visits to the offices of nonfederally employed physicians in the United States. Repeated cross-sectional data from NAMCS collected in years 2012 and 2013 were used for these analyses.

Computer-assisted data collection methods are used to capture the physician-patient encounter. Data include patient demographic characteristics (sex, race-ethnicity, and age), continuity-of-care information (including number of visits in the past 12 months), reason for the visit, diagnosis for the current visit, existing chronic conditions (including depression), diagnostic and screening tests ordered or provided (including depression screening), and treatments provided (including new and continued medications). Data describing the characteristics of the practice are collected during the physician induction interview. The automated survey tool was accessible either through a Web portal or a laptop computer supplied to providers by data collection staff. Data describing the physician-patient encounter can be reported by the physician or abstracted from medical charts by a physician, a physician's staff, or a Census field representative. Details on the survey, data collection instruments, data collection procedures, and sampling design are available elsewhere (43).

### Study Population

In order to focus on individuals targeted by current depression screening guidelines, we limited the sample to adults without existing depression. A total of 131,203 visits were included in the 2012 and 2013 NAMCS data releases. Of these, 23,741 visits were excluded because the patient was under age 18. Subsequently, 12,892 visits were excluded because the context of the visit was not suitable for screening services (for example, the visit prompted an emergency room or inpatient admission or the patient left before being seen) or because of data quality issues (such as missing or noncodable data on diagnosis or reason for visit). Given this study's focus on primary care, we limited the sample to visits in which the physician specialty was general and family practice, internal medicine, pediatrics, or obstetrics and gynecology, resulting in 37,458 visits. Of these visits, 3,346 (8.9%) were excluded because depression was recognized as a preexisting condition requiring assessment rather than screening. The primary reason for a visit was obtained from the open-ended question on the instrument inquiring about the patient's complaint(s), symptom(s), or other reason(s) for the visit. We excluded visits by patients who presented with depression (N=459) because, like patients presenting with a preexisting condition of depression, an assessment, rather than screening, would be appropriate. The final sample consisted of 33,653 visits, corresponding to a national estimate of 630 million visits.

## Measures

**Depression screening.** The data collection instrument included a 59-item checklist of medical services provided during the appointment, including depression screening. In addition, if a diagnosis of depression was associated with the sampled visit, it was assumed that depression screening occurred, even if it was not indicated on the checklist (inferred screening), given that patients presenting with depression were already excluded from the study population.

**Independent variables.** Earlier studies suggest that depression recognition and screening practices vary by patient characteristics, such as age, gender, race-ethnicity (17), and health status (44). Accordingly, we controlled for patients' age, sex, race-ethnicity, and number of chronic illnesses diagnosed. Payment source was included as a covariate for two reasons. First, it is a proxy for socioeconomic status (SES) of the patient. Second, given that payers may reimburse for depression screening at different rates, screening practices may vary across expected source of payment. Although testing the impact of SES and reimbursement rates directly is not possible with NAMCS, payment source was included in the models to avoid omitted-variable bias. Similarly, because depression screening is often reimbursed as an annual service, we differentiated between patients with more than one visit within the last 12 months and those presenting for care for the first time in 12 months (including new patients). Higher screening rates are expected when a service is billable. Differences in depression screening based on whether patients were seen by their primary care provider were also explored, given that familiarity with the patient may influence provider behavior. Last, urban-rural differences in the prevalence of psychiatric disorders have been documented (45) and were also included in our model.

We hypothesized that the status of EHR adoption (full [all electronic], partial [part paper, part electronic], and none [paper only]) was associated with screening rates, given the potential for EHRs to identify patients due for preventive and follow-up care (46). To further test this hypothesis, we explored the associations between EHR functionality and screening rates. During the induction phase of sampling, physicians indicated whether their system provides reminders for guideline-based screening and whether their EHR includes a problem list. Furthermore, we explored the association between depression screening and intentions to participate in the federal program that provides financial incentives for the meaningful use of certified EHR technology (46). Within the instrument, meaningful use was measured by level (practice already applied for incentives, practice intends to apply in the future, uncertain, or practice will not apply for incentives). Although depression screening is not required during stage 1 of the meaningful use program, preventive care practices are consistent with the program's overall objective of continually improving quality at point of care. Therefore, as a preventive care practice,

depression screening could be positively associated with participation in the meaningful use program (46). Finally, we included a variable relevant to physicians' financial incentives, indicating whether "specific measures of quality, such as rates of preventive services for the patients" are factored into the determination of physician's compensation. This variable was categorized under functionality/use of EHRs because these systems are commonly used to track quality measures (47).

## Analyses

Univariate statistics are presented to describe the study population, including sample size (unweighted) and population distribution (weighted to reflect national estimates). Bivariate differences in rates of depression screening by independent variables were tested by Pearson chi-square tests. Multivariate logistic regression was used to model the odds of receiving screening for depression, with the analyses controlling for gender, race-ethnicity, age, expected source of payment, continuity of care, whether the visit provider was the patient's primary care physician, practice location, EHR use, and number of chronic conditions. These analyses were replicated for the subset of visits to practices that had fully implemented EHRs in order to identify specific components of the EHR systems that were associated with greater likelihood of depression screening, including four additional covariates characterizing the functionality and use of EHRs (use of reminders for guideline-based screening, availability of a problem list, participation in the meaningful-use incentive program, and whether quality indicators impact physician's compensation). Analyses were conducted by using Stata statistical software, using survey commands with Taylor-linearized variance estimation and correcting for the complex sampling design (48). An alpha of .05 was used to indicate significance.

## RESULTS

Of the sample population, 63.5% were female, 71.0% were white, and 71.2% were under age 65. In addition, 88.2% were established patients and 68.8% were seen by their primary care provider. Private insurance or Medicare was the expected source of payment for 84.6% of visits, and Medicaid was expected to pay for 9.2% of visits. Most (88.2%) visits occurred within a metropolitan statistical area, and 64.1% of visits occurred within practices that had fully adopted an EHR system at the time of the survey.

Overall, 4.2% of adults were screened for depression (Table 1). A total of 47% (N=679) of visits in which screening took place resulted in a new depression diagnosis. Screening rates varied significantly by race-ethnicity, age, and the practice's use of EHRs. Results from the multivariate model were generally consistent with bivariate findings. African Americans were half as likely as whites to be screened, and patients age 65 or older were less likely to be screened than those who were middle aged (adjusted odds ratio

[AOR]=.48). Females were more likely to be screened for depression compared with men (AOR=1.36). Medically complex patients were screened more often: each additional chronic condition increased the odds of screening (AOR=1.51). Providers with full EHR adoption were more likely to screen for depression compared with providers with no use of EHRs (1.81).

Among providers who had fully implemented EHRs, the presence of problem lists increased the odds of screening by fourfold; however, this was not a substantially significant finding because only 2% of the practices did not use problem lists (Table 2). Inferences related to other covariates were robust, replicating the findings for the full sample (data not shown). Contrary to our hypotheses, there were no significant variations in screening odds by use of electronic reminders, participation in the meaningful-use program, or whether provider's compensation had ties to quality-of-care indicators.

**TABLE 1. Depression screening rates and likelihood of screening during visits to physicians, 2012 and 2013<sup>a</sup>**

Characteristic	Visits		Visits with depression screening			Likelihood of screening	
	N	%	N	%	p	AOR	95% CI
Total visits	33,653	100	1,445	4.2			
Patient's gender					.110		
Male (reference)	12,120	36.5	459	3.8			
Female	21,533	63.5	986	4.4		1.36	1.13–1.64
Patient's race-ethnicity					.003		
White (reference)	25,630	71.0	1,160	4.6			
African American	3,429	10.9	119	2.8		.50	.37–.67
Hispanic	3,021	13.0	122	3.7		.77	.55–1.07
Other	1,573	5.1	44	2.6		.54	.33–.87
Patient's age					.001		
18–24	3,067	8.6	85	2.8		.88	.62–1.25
25–44	9,670	28.5	388	3.5		1.00	.80–1.24
45–64 (reference)	11,208	34.1	603	5.3			
≥65	9,708	28.7	369	4.0		.48	.39–.59
Patient's source of payment					.483		
Private or Medicare (reference)	28,745	84.6	1,226	4.3			
Medicaid	2,933	9.2	132	4.1		1.15	.87–1.53
Self-pay or other	1,975	6.2	87	3.4		.95	.66–1.38
Continuity of care					.553		
New patient (reference)	3,834	11.8	168	4.5			
Established, past visit <12 months	26,518	78.6	1,133	4.1		.73	.55–.97
Established, no visit within past year	3,301	9.6	144	4.7		.95	.64–1.40
Physician provides comprehensive primary health care of the patient					.087		
No (reference)	11,020	31.2	432	3.5			
Yes	22,633	68.8	1,013	4.5		1.09	.80–1.49
Location					.755		
MSA (reference) <sup>b</sup>	27,428	88.2	1,210	4.2			
Rural	6,225	11.8	235	4.0		.90	.66–1.21
Electronic health record adoption by provider					.001		
None (reference)	7,957	24.7	215	2.5			
Partial	3,253	11.1	122	3.5		1.33	.85–2.07
Full	22,443	64.1	1,108	5.0		1.81	1.32–2.48
Patient's number of chronic conditions	—		—			1.51	1.40–1.62

<sup>a</sup> Percentages for bivariate and multivariate analyses are weighted, reflecting national estimates.

<sup>b</sup> Metropolitan statistical area

## DISCUSSION

Overall, the rate of depression screening in primary care was 4.2%. Given that the majority of depression care is provided within primary medical settings (49,50), this rate suggests that physicians may be missing important opportunities to identify individuals experiencing depression and link them to care. It is possible that patients who were seen more than once in the last 12 months were screened at an earlier visit, resulting in an underestimate of annual screening rates. However, the screening rate for patients presenting for the first time in 12 months was similar to those who had been seen more than once in the past year, suggesting that such an underestimation would not be substantial.

A diagnosis of depression was reported in a large proportion of the visits with depression screening (47%), reflecting that the current screening practices have a high positive predictive value. This finding also may suggest

that screening was heavily influenced by whether depression was suspected or symptoms were observed. Patterns of screening also resembled those of general depression prevalence: screening rates were disproportionately lower among African Americans, older adults, and men (44). These findings suggest that providers may be targeting high-risk groups by screening patients with a higher probability of depression. Complicating this interpretation, however, is the body of evidence suggesting that depression is also often underdiagnosed or unrecognized among African Americans (20), older adults, and males (21–24). The literature suggests that the clinical presentation of depression may be particularly nuanced among these groups, making it more difficult for providers to detect symptoms when they are present. For example, studies have shown that both African Americans (51) and

**TABLE 2. Depression screening rates and likelihood of screening during visits to primary care practices that had fully implemented electronic health records (EHRs)<sup>a</sup>**

Characteristic	Visits		Depression screening			Likelihood of screening	
	N	%	N	%	p	AOR <sup>b</sup>	95% CI
Total visits	22,443	100	1,108	5.0			
Reminders for guideline-based screening					.570		
No (reference)	5,476	24.3	234	4.5			
Yes	16,967	75.7	874	5.2		1.13	.68–1.90
Use of problem list					.001		
No (reference)	554	2.1	8	1.1			
Yes	21,889	97.9	1,100	5.1		4.46	1.85–10.8
Participation in meaningful-use program <sup>c</sup>					.762		
Already applied (reference)	16,233	73.4	739	4.8			
Intends to apply	2,884	11.9	170	4.8		1.10	.73–1.67
Uncertain whether to apply	1,490	7.0	78	4.8		1.20	.68–2.12
Will not apply	1,568	7.7	100	6.3		1.67	.79–3.53
Quality indicators affect physician's compensation					.600		
No (reference)	17,199	52.9	818	4.9			
Yes	5,244	20.7	290	5.5		1.04	.64–1.71

<sup>a</sup> Percentages for bivariate and multivariate analyses are weighted, reflecting national estimates.

<sup>b</sup> Control variables included gender, race-ethnicity, age, expected source of payment, continuity of care, usual primary provider, practice location, and number of chronic conditions.

<sup>c</sup> Participation in the federal program that provides financial incentives for the meaningful use of certified EHRs

older adults (52) commonly exhibit somatic symptoms of depression, such as headaches, lethargy, and bodily pain, rather than mood-related complaints, such as sadness or anhedonia. Therefore, recognizing depression requires providers to accurately differentiate somatic symptoms stemming from depression from those caused by general medical ailments that may be a result of the normal aging process or other medical conditions (53). Similarly, depressed men are more likely than women to present with substance use, aggression, and risk-taking behavior (54), which, if misattributed, may redirect the focus of interventions away from further assessment of depressive symptoms. Findings from this study contribute to this narrative, suggesting that a failure to consistently apply standards of universal screening across all patient groups may exacerbate existing disparities in the identification and diagnosis of depression.

EHRs may be an effective mechanism to increase routine screening for depression. Screening was more common within clinics that used EHRs versus paper charts. By standardizing work flows and providing additional cues to screen, these features may help providers adopt the practice of depression screening more often. To this end, our findings indicated that patients with a chronic condition were more likely than patients without a chronic condition to receive depression screening, and the likelihood of being screened increased with each additional chronic condition. This finding is contrary to previous work that suggested that increased patient complexity lowered the odds of depression screening in clinics with

EHRs (55). One explanation for our finding is that medical complexity may increase the total number of automatic prompts for preventive procedures and screenings, thereby increasing the salience of prompts for depression screening as well. We did not observe an association between level of meaningful use of EHRs and depression screening rates, perhaps because clinical quality indicators at stage 1 do not require depression screening. Last, although we hypothesized that the presence of financial incentives tied to quality indicators would increase depression screening, empirical results suggested that this was not the case. It is possible that financial incentives influence how physicians prioritize tasks, but

depression screening may be crowded out by other services and procedures with greater salience within quality metrics.

Results should be interpreted with caution. The NAMCS data include only a dichotomous indication of depression screening, making it impossible to know how screening was subjectively defined by providers. To our knowledge, the validity of this indicator of depression screening has not been assessed; however, reliability and validity studies have shown that NAMCS data have low sensitivity and high specificity overall and may, therefore, underestimate the amount of depression screening (56). In addition, these results present only statistical associations between patient and practice characteristics and depression screening; deriving causal inferences would require different study designs. At the same time, the NAMCS survey is considered to be a major national source of information regarding medical care provision and to have ample statistical power to make nationally representative estimates of rates of depression screening.

## CONCLUSIONS

Despite recommendations for depression screening in primary care, this practice was highly infrequent in 2012 and 2013. Furthermore, disparities in screening rates were identified, with African Americans, older adults, and men among the least likely to be screened. Although efforts have been made to make depression screening routine and cost-effective, this practice has yet to be effectively integrated



into routine medical care. Use of EHR systems may be a useful tool in standardizing this practice.

## AUTHOR AND ARTICLE INFORMATION

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