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Health Plans' Disease Management Programs: Extending across the Medical and Behavioral Health Spectrum?

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Abstract

While the disease management industry has expanded rapidly, there is little nationally representative data regarding medical and behavioral health disease management programs at the health plan level. National estimates from a survey of private health plans indicate that 90% of health plan products offered disease management for general medical conditions such as diabetes, but only 37% had depression programs. The frequency of specific depression disease management activities varied widely. Program adoption was significantly related to product type and behavioral health contracting. In health plans, disease management has penetrated more slowly into behavioral health, and depression program characteristics are highly variable.

Keywords

disease management; depression; managed care; health plans

Disease management programs have expanded rapidly for chronic general medical conditions such as diabetes and congestive heart failure, and have also been applied to behavioral health conditions such as depression. In 2005, health plans and other payers spent an estimated \$1.5 billion on disease management compared to \$78 million only a decade ago (Glabman, 2006). Evidence of interest in disease management also comes from the investment of the Centers for Medicare and Medicaid Services in large-scale initiatives, including Medicare Health Support, targeting beneficiaries with congestive heart failure, complex diabetes, or chronic-obstructive pulmonary disease (McCall et al., 2007) and the Medicare Coordinated Care Demonstration for persons with a range of chronic illnesses (Brown et al., 2007).

Despite the apparently rapid growth in disease management, there is little nationally representative data describing the prevalence and characteristics of disease management programs, including for depression, at the health plan level. The topic has occasionally been

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addressed in employer surveys, but without reporting on behavioral health as well as general medical disease management, or allowing health plan-level estimates (Gabel et al., 2005). In this paper, data from a survey of private health plans provide national estimates of the prevalence of disease management for both general medical disorders and depression, plan attributes associated with program adoption, and features of depression programs in particular.

Background

Developed primarily to address high-cost chronic conditions, disease management has been defined as “a system of coordinated healthcare interventions and communications for populations with conditions in which patient self-care efforts are significant” (Disease Management Association of America, 2006). Program characteristics vary, but the Disease Management Association of America (DMAA) identified six key elements in its framework: population identification processes; evidence-based practice guidelines; collaborative practice models; patient self-management education; process and outcomes measurement, evaluation, and management; and routine reporting and feedback (Disease Management Association of America, 2006). Thus, disease management may include but is not limited to more traditional approaches such as case management, which typically focuses on assessment and coordination of care for individuals but does not include the more systemic, population-based elements of disease management.

Comparison of disease management and the chronic care model

Disease management is often described in terms that suggest it has much in common with Wagner's chronic care model, a comprehensive approach to improving care for patients with chronic illness (Wagner, 1998). However, although disease management programs do aim to improve outcomes as well as to reduce costs, they do not necessarily involve health care delivery system changes of the kind envisioned in Wagner's chronic care model, in which physician practices themselves are transformed in order to optimally address chronic illness. Indeed, a survey of selected “best practices” disease management programs found that most were relatively limited in their strategies (Wagner, 2002). It has been observed that disease management programs try to improve quality by communicating directly with patients rather than working to change physician practice and, in contrast to the chronic care model, feature primarily long-distance rather than practice-based communication (Casalino, 2005). Yet, the conceptual commonality is substantial. Among the six elements of the chronic care model, four clearly overlap with DMAA's framework: delivery system design (e.g., multidisciplinary team, case management); decision support (e.g., training and reminders to support guideline adherence); clinical information systems (e.g., to enable performance feedback to providers); and patient self-management support. The chronic care model notes the additional elements of health care organization (e.g., leadership support, quality improvement processes); and community resources. Both the terms “disease management” and “chronic care interventions” have, in fact, been applied to a wide range of interventions with heterogeneous features and intensity, and the literature reflects a mix of these.

Effects of disease management programs

Several reviews and meta-analyses have documented benefits of disease management for various chronic disorders in terms of improved care processes and some clinical outcomes (Badmagarav et al., 2003; Congressional Budget Office, 2004; Mattke et al., 2007; Ofman et al., 2004; Tsai et al., 2005). One recent review emphasized that current evidence indicates improvement for intermediate rather than long-term outcomes, and that there are few rigorously-designed evaluations of large-scale, population-based programs (Mattke et al. 2007). Recently, evaluation of the first two years of the Medicare Coordinated Care Demonstration indicated few effects except a small reduction in hospitalization rates (Brown et al., 2007). The first evaluation of Medicare Health Support (a randomized controlled trial) presents data from less than six months of care management and is viewed as too preliminary to provide early conclusions on quality of care and outcomes (McCall et al., 2007). It should be noted that many of the programs that have been studied are relatively intensive, and some may fit closely with the full chronic care model.

The effects of disease management on utilization and economic outcomes are less clear. Systematic reviews indicate that relatively few methodologically sound studies have found cost savings, and that return on investment in terms of health care costs exists for some but not all diseases (Congressional Budget Office, 2004; Goetzel et al., 2005; Ofman et al., 2004). One recent meta-analysis found a small to moderate effect of disease management on economic outcomes (Krause, 2005). This study also found that higher disease severity, rather than specific disease type, was related to better economic outcomes. However, a systematic review of reviews, meta-analyses and large-scale population studies concluded that for most diseases there is insufficient or inconclusive evidence of either reduced health care utilization or improved financial outcomes (Mattke et al., 2007). New studies such as one that recently found that asthma disease management did reduce hospitalization rates (Johnson et al., 2007) continually add to the evidence base, but as yet the evidence appears mixed. The Medicare Coordinated Care Demonstration evaluation found no reduction in Medicare expenditures over two years (Brown et al., 2007).

Depression as a target for disease management

Many behavioral health conditions share key characteristics with other chronic medical conditions, including high levels of health care utilization, need for coordination across providers, and the need for patient self-management to achieve optimal health outcomes (Gelber and Dougherty, 2005; McLellan et al., 2000). For example, depression is a common, often chronic disorder that causes substantial disease burden and disability, and associated economic costs. Lifetime prevalence of major depression is 17% and 12-month prevalence is 7% (Kessler et al., 2005a; Kessler et al., 2005b). Persons with depression are at greater risk of suicide, experience lower quality of life, and have lower workplace productivity than others (U.S. Department of Health and Human Services, 1999). Mood disorders, which include depression, are associated with greater disability than many other serious medical disorders (Druss et al., 2002). Average health care costs for patients with depression are 50% to 100% higher than for patients overall (Katon et al., 2003; Simon et al., 1995). Workers suffering from depression have between 1.5 and 3.2 times as many short-term disability days as other workers (Kessler et al., 1999).

Meta-analyses and reviews have found that depression disease management programs improve quality of care and outcomes defined in various ways (Badmagarav et al., 2003; Mattke et al., 2007; Tsai et al., 2005). It has been noted that the evidence thus far supports improvement in intermediate outcomes rather than long-term ones (Mattke et al., 2007), although a recent randomized controlled trial has found longer-term improvement (Wang et al., 2007). The interventions included typically reflect a range of features and intensity. At the same time, numerous studies have failed to find a positive return on investment for depression disease management programs in terms of short-term health care costs (Goetzel et al., 2005). A review of reviews concluded that depression disease management increases both utilization and costs (Mattke et al., 2007). Recent cost-benefit modeling and randomized controlled trials that include productivity, absenteeism and other workplace measures and a longer time horizon, however, suggest significant net benefit to employers (LoSasso et al., 2006; Wang et al., 2006; Wang et al., 2007).

Some health insurers have begun to offer depression disease management with the dual goals of improving screening and treatment and reducing health care costs. Health plans' depression disease management programs are often contracted out to managed behavioral healthcare organizations (MBHOs). At the same time, most health plans contract with MBHOs for management and delivery of specialty behavioral health services provided under the benefit plan (sometimes referred to as "carve-outs"). The two types of contracted services are distinct from one another. Standard management and delivery of behavioral health services involves specialty behavioral health care only, includes a network of specialty providers to deliver those services, and employs utilization management approaches such as prior authorization for specialty care. Disease management programs typically aim at support and coordination of care for persons with depression in both specialty and general medical settings, and do not directly provide or authorize depression treatment.

The current study provides nationally representative data on health plans' disease management programs, with a particular focus on depression. These data from 2003—when disease management as an approach was already well underway—will inform primary care and other providers, policymakers, health plans, employers, and other health care stakeholders about the degree to which adoption of disease management by commercial health plans has extended as rapidly to depression as to other chronic medical disorders, what health plan characteristics appear to influence adoption, and what activities are conducted under the "disease management" rubric for depression.

Methods

Data and Sample

Study data come from the 2003 round of a nationally representative survey of private health plans regarding disease management and behavioral health services. We surveyed 368 of 441 eligible plans in 60 market areas (83% response rate). This telephone survey included an administrative module addressing topics such as behavioral health benefits and contracting arrangements (completed by 368 plans), and a clinical module that addressed more clinically oriented topics including disease management programs (completed by 347 plans).

Typically there were two respondents per plan (executive director for the administrative module and medical director for the clinical module, or their designees) although this varied based on the plan's structure.

The survey is linked to the Community Tracking Study (CTS) (Kemper et al., 1996) through its use of the 60 market areas CTS selected to be nationally representative. In brief, the CTS market areas were mostly selected with probability proportional to size, independently from within each of three size strata (a minority of market areas were selected with certainty). Plans were then selected within markets, using a sample allocation strategy based on both product type offerings and estimated enrollment. Each market area-specific plan was asked about its three largest private HMO, POS, or PPO insurance products (unweighted N=751 products with data for both modules including disease management items are analyzed here; weighted N=7,376 products). Products were defined as “packages, plans or contracts that are similar in terms of out-of-network coverage, referrals, and primary care physicians.” We conducted a non-response analysis; responding plans were more likely to offer HMO products.

Measures

We asked whether, within each product offered, plans provided disease management for several general medical disorders (diabetes, congestive heart failure, asthma), depression, or any behavioral health condition besides depression. For each product's largest behavioral health program, we asked about program administration (in-house versus contracted out) and specific activities within the disease management program (including visit reminders to patients, performance feedback to providers, case management and other activities). Almost all products with behavioral health disease management had only depression programs, which we report on. For the purpose of this analysis, we matched the activities that we asked about with DMAA's elements of disease management, as DMAA represented industry standards for commercial disease management programs, as well as with the four overlapping chronic care model elements. We assigned each activity to what we considered to be the most relevant elements.

We categorized products as health maintenance organization (HMO), point-of-service (POS) or preferred provider organization (PPO). We created a variable to capture plans' contracting arrangements for specialty behavioral health benefits. We categorized plans as follows: contracts with specialty MBHO; contracts with vendor providing both behavioral health and general medical services (“comprehensive contract”); internal provision (behavioral health services provided by plan employees or through a network administered by the plan). We gathered data on tax status and plan enrollment within market and mapped our sites to aggregated Census region.

Statistical Analysis

The findings reported are national estimates. The data shown in tables are weighted to represent plans' commercial managed care insurance products in the continental U.S. Statistical analyses were implemented using SUDAAN software for accurate estimation of the sampling variance given the complex sampling design (Research Triangle Institute,

2002). Analyses are conducted at the product level. When comparing results by plan characteristics, we used pairwise t-tests to determine significance, applying the Bonferroni correction for multiple comparisons. We conducted logistic regression to identify predictors of having programs for depression in addition to other chronic medical disorders. We excluded from the regression the small minority of products with no disease management. In addition, we computed enrollee-weighted disease management prevalence estimates based on enrollment figures provided by survey respondents in most cases, or median enrollment for the plan's size class as determined through publicly available sources in other cases.

Results

Almost 90% of private health plan products offered at least one disease management program for diabetes, congestive heart failure, asthma, or depression (Table 1). About 88% had programs for diabetes, 89% for asthma, and 85% for congestive heart failure (data not shown). General medical disease management (meaning disease management programs for diabetes, asthma or congestive heart failure) was more common than depression programs, with 53% of all products offering general medical only and another 37% offering both depression and general medical programs. Products that had depression programs always had other medical disease management programs as well. Few products overall did not offer any programs we asked about, but 25% of PPO products fell into this category.

The prevalence of disease management varied significantly by health plan characteristics. HMO products were significantly more likely to offer depression disease management, as were products with specialty behavioral health contracting. Over 44% of products with specialty contracts offered general medical and depression disease management, compared to 16% of products with comprehensive contracts or internal behavioral health arrangements. Products in the West region of the country and products with large (>50,000) market-area enrollment were more likely to offer depression programs.

Larger plans are more likely to have disease management programs (as seen in Table 1), and depression programs in particular. Thus, it follows that prevalence will be greater if defined as the proportion of enrollees covered, rather than as the proportion of products, if products with disease management programs provide them to all enrollees. We computed disease management prevalence rates using enrollee weights for each plan. As expected, overall prevalence is higher when measured at the enrollee level, but not dramatically so: 49% of enrollees were in products offering general medical disease management only, 44% were in products with both general medical and depression disease management, and 6% were in products with no disease management (data not shown).

Over 83% of products with depression disease management contracted with an outside vendor (Table 2). All vendors were MBHOs (data not shown). Specific activities varied significantly by disease management administration. For example, 45% of products with in-house programs performed face-to-face case management as part of their disease management program compared to 2% of those contracting with MBHOs. Table 2 also maps the survey responses for patient- and provider-focused activities to DMAA's disease management program elements. Aspects of each DMAA element are used by most

programs, but there is notable variation in terms of individual activities within those categories. For example, nearly all programs conducted several patient self-management/education activities. However, although most also conducted activities within the “process and outcomes measurement” category, only half provided outcomes measurement with feedback to patients and providers. Reminders to providers regarding visit or medication follow-up was a much more common activity within that category. Corresponding chronic care model elements are noted for each activity. Again, most programs incorporated at least one activity representing each element, but some individual activities were much more common than others, both within and across elements. For example, for delivery system design, reminders and telephone case management were much more common than face-to-face case management.

Logistic regression results indicate that among products with any disease management, HMO and POS products are significantly more likely to offer depression programs than PPOs (Table 3). Products with specialty contracts are more likely than products with internal behavioral health to offer depression disease management. Products in the South were significantly less likely to offer depression programs, while not-for-profit products and those with market-area enrollment over 50,000 were more likely to do so.

Discussion

The vast majority of health plan products available to private purchasers offered disease management programs for several chronic general medical disorders, while only one third did so for depression. The proportion of enrollees covered by depression disease management is somewhat larger than the proportion of products using it, but still less than half of the total.

Both health plans' and purchasers' perceptions about the potential impact may influence the establishment of programs for particular conditions. Disease management programs that can provide evidence for savings in health care expenditures or workplace productivity may be more likely to be adopted by health insurers and employers (Leatherman et al., 2003). The high direct and indirect costs of depression have been well documented, and mood disorders overall have been found to be among the 10 most costly conditions nationally (Druss et al., 2001). There is evidence of improved care processes and at least intermediate outcomes resulting from depression disease management (Badmagarav et al., 2003; Mattke et al., 2007; Tsai et al., 2005), notwithstanding that many of the interventions studied are more intensive than those typically found in private health plans. However, there is some evidence that depression DM does not result in a positive return on investment in terms of direct health care cost savings at least in the short term (Goetzel et al., 2005) and this may have hampered the adoption of depression DM programs. Indirect cost savings such as improved productivity may be substantial but they do not accrue directly to health insurers. They do, however, create a business case for effective mental health treatment on the employer side (Goetzel et al., 2002). Organizations such as the National Business Group on Health are highlighting this viewpoint and providing behavioral health purchasing tools to employers (Finch and Phillips, 2005). To the extent that depression disease management enhances effective treatment, employer demand may play an especially important role in health plan

adoption of these programs. Dissemination of recent cost-benefit modeling that incorporates more comprehensive measures and predicts positive return on investment from the employer perspective, as well as randomized controlled trials with positive results (e.g. Wang et al., 2007), may help to boost demand.

The lesser adoption of depression disease management programs may also stem from the fact that there is significant room for clinical judgment in the face of uncertainty in some aspects of treating depression. This ambiguity may lead depression to be perceived as less amenable to disease management approaches. For example, in milder cases of depression, psychotherapy and antidepressant medications may yield equally positive results, and patient preferences play a major role. There are also decision points in the course of antidepressant treatment that involve a high degree of judgment and customizing. It has been asserted that gray areas in depression treatment may be particularly salient in primary care, where often milder depressive disorders are encountered that fall within the “uncertainty zone” regarding likelihood of benefit specifically of antidepressant treatment (Anderson, 2003). The previously noted lack of intensive interface with treatment providers common in commercial disease management programs may also constitute a challenge for program adoption and effectiveness. More generally, there is the often cited fact that diagnosis and treatment of mental disorders typically cannot rely on biological markers as in many non-psychiatric illnesses. At the same time, there are widely accepted, evidence-based treatment guidelines and screening diagnostic approaches for major depression (Agency for Health Care Policy and Research, 1993; American Psychiatric Association, 2000) and management of many chronic general medical disorders also involves significant ambiguities and challenges. Disease management approaches for depression can thus rely on essential tools similar to those for other disorders.

Liability concerns related to “third party” involvement in the care process may be an issue. For example, if disease management program staff in telephonic contact with a patient learn of suicidality, how might the way this is communicated and managed affect the liability of the treating provider or health plan? While analogous situations could occur in managing any disease, perceived greater ambiguity in depression treatment could heighten concerns. Lingering stigma may also affect demand for depression disease management despite the rising proportion of the population receiving mental health treatment (Wang et al., 2006) and the increasing use of antidepressants in particular (Zuvekas et al., 2005). Individuals may be less likely to voice concerns about mental health treatment to either employers or health plans, and some employers and health plans may still give short shrift to behavioral health.

Alternatively, while our data do not address this point, it is important to look at how general medical disease management programs deal with depression. These programs may screen for and/or intervene in ensuring treatment for depression because depression is often co-occurring and can complicate treatment and outcomes for various medical disorders. To the extent that instituting depression disease management is motivated by recognition of how depression can worsen adherence and outcomes in other chronic disorders, there might be fewer separate depression programs and more integration of depression screening and treatment guidelines within these other disease management programs. Given comorbidity prevalence and complex patient needs, the subpopulation of patients with depression plus

serious medical comorbidities may be a particularly important target for disease management. Yet, adding separate disease management programs might exacerbate fragmentation and coordination challenges. Formal “multi-condition” disease management programs have been developed recently to incorporate more integrated approaches to disease management for persons with comorbidities (Managed Care Week, 2007).

Products with specialty behavioral health contracts may be more likely to adopt depression disease management programs because they already have established relationships with behavioral health care vendors. Over 90% of products with a managed behavioral health contract and a depression disease management contract used the same vendor for both (data not shown). The finding that products with internal behavioral health arrangements were less likely to offer depression programs could reflect more integrated plan structures that might be viewed as requiring less additional attention to coordination and care management, although our data do not specifically address this point. Plan enrollment was also positively related to disease management offerings. Larger plans may be more likely to offer depression disease management due to the potential savings for a large population, and the greater opportunity to recover fixed costs in contracting or program infrastructure. Medium-size enrollment was associated with general medical-only disease management suggesting a somewhat different dynamic depending on the program.

The characteristics of disease management programs for depression clearly vary across products. While the survey did not contain an exhaustive activity list, it did touch upon each element of disease management as defined by DMAA and at least four of the chronic care model elements. Considered in terms of both DMAA and chronic care model elements, most products had disease management programs that featured activities within each category. However, there is variation in the “intensity” of activity within each element category; often one or two activities (such as visit reminders or telephone case management) were ubiquitous while others were much less common. For example, outcomes measurement with feedback was not as common as might be expected; this may be due to the more resource-intensive nature of this activity. Results confirm the perception that vendor-operated disease management programs are largely telephonic in nature or utilize other remote technology, relying heavily on components of disease management such as telephone case management, reminders to patients, and reminders to providers, but not face-to-face case management. These results may or may not be indicative of programs for conditions other than depression; future research could illuminate this issue.

While many disease management programs in private health plans may be less intensive or otherwise different than chronic care interventions studied in the literature, there is some recent evidence that the number of chronic care model elements may not be associated with better outcomes (Tsai et al., 2005). Certainly more research is needed on this point, in the context of typical commercial disease management programs. It is also worth noting that the modification of approaches found to be efficacious is a common implementation issue.

Limitations of the study include lack of information on how reported programs were implemented in practice. To the extent that disease management may be purchased as an

optional add-on, enrollee-level prevalence would be lower than the estimates here. Participation rates or patient outcomes were not addressed in this organizational survey.

Conclusion

In summary, though disease management programs for several chronic medical conditions were offered by the large majority of health plan products, depression programs were less common and there was significant variation in the activities conducted. Our findings suggest that the disease management trend was evident but had not fully penetrated into the behavioral health arena as of 2003, providing a useful view of adoption patterns at a point in time when disease management approaches had already become an established part of the health care landscape. Plan characteristics are significant predictors of disease management adoption, and depression disease management programs typically included telephonic case management, educational materials for patients, visit and medication reminders for both patients and providers, and distribution of practice guidelines.

Given the continuing -- if not intensifying -- focus on coordinating and improving care for chronic illness, including Medicare disease management initiatives, these results remain highly relevant. Stronger evidence of direct health care cost savings and/or higher employer demand (related to improved productivity, reduced absenteeism and disability costs) could contribute to reducing the differential adoption rate between general medical and depression disease management. Future research could illuminate the similarities or differences in disease management program activities for depression relative to other chronic illnesses; explore how disease management programs for persons with multiple comorbidities including depression might best be structured; provide further information on the extent of interaction between disease management staff and primary care or other treatment providers; and evaluate the impact of the types of programs that are currently most common in private health plans. Tracking the development of disease management in private health plans will be important as ongoing change seems likely, given strong motivations to lower health care expenditures and improve health outcomes and workplace productivity.

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Table 1

Type of Disease Management Program, By Health Plan Characteristics

	Weighted Percent of Products				
Variable	Medical Only N=3,904	Medical Plus Depression N=2,716	None N=756	Total	
Product Type					
HMO	48.6% ^a	47.5% ^{a,b}	3.9% ^a	2,156	100.0%
POS	59.7% ^a	38.8% ^{b,c}	1.5% ^b	2,681	100.0%
PPO	49.4%	25.7% ^{a,c}	24.8% ^{a,b}	2,540	100.0%
Contracting Arrangement					
Specialty	53.0%	44.2% ^{a,b}	2.8% ^a	5,440	100.0%
Comprehensive	34.3% ^a	16.1% ^a	49.6% ^{a,b}	909	100.0%
Internal	68.9% ^a	16.1% ^b	15% ^b	1,028	100.0%
Region					
Northeast	59.7% ^a	37.4%	2.9% ^{a,b}	781	100.0%
Midwest	48.7%	29.5% ^a	21.9% ^{a,c}	2,003	100.0%
South	59.2% ^b	37.2%	3.7% ^{c,d}	3,232	100.0%
West	40.5% ^{a,b}	46.5% ^a	13.0% ^{b,d}	1,359	100.0%
Plan Enrollment in Market Area					
Small (<10,000)	57.9%	24.2% ^a	17.9% ^a	2,723	100.0%
Medium (10,000-50,000)	71.7% ^a	24.6% ^b	3.7% ^a	1,992	100.0%
Large (>50,000)	43.6% ^a	45.6% ^{a,b}	10.8%	1,547	100.0%
Tax Status					
For profit	55.4% ^a	37.4%	7.1% ^a	6,332	100.0%
Not-for-profit	37.7% ^a	33.0%	29.2% ^a	1,044	100.0%
Total	52.9%	36.8%	10.2%		

Notes: Data are weighted to be nationally representative. Percents are based on non-missing values (disease management item missing = 2%, enrollment variable missing = 13% of products). Percent may not total to 100% due to rounding.

^a Pairs within each column and variable group that share superscript letter significantly different, p<.05 after applying Bonferroni adjustment for multiple comparisons.

^b Pairs within each column and variable group that share superscript letter significantly different, p<.05 after applying Bonferroni adjustment for multiple comparisons.

^c Pairs within each column and variable group that share superscript letter significantly different, p<.05 after applying Bonferroni adjustment for multiple comparisons.

Table 2
Activities Conducted Within Health Plans’ Depression Disease Management Programs, by Type of Program Administration

Depression Disease Management Contracting Arrangement				Disease Management Association of America Key Elements ¹					
Weighted Percent of Products				Population Identification	Evidence-based practice guidelines	Collaborative practice models	Patient self-management education	Process and outcomes measurement, evaluation, management	Routine reporting/feedback
Total (N=2591)	In-House (N=430)	Contract Out (N=2161)							
Patient Activities									
Disorder specific educational materials for patients, printed or online (a)	96.5%	80.7%	99.7%				X		
Telephone case management (a,b)	99.6%	99.2%	99.5%			X	X		
Face-to-face case management (a,b)	8.7%	45.0%	1.5% ^{***}			X	X		
Reminders to patients regarding visit or medication compliance (a,b,c,d)	97.1%	95.6%	97.3%				X		
Nurse call center or similar help line providing disorder specific advice (a,b,d)	59.1%	71.8%	56.6%				X		
Outcomes measurement with feedback to patients (a,c,d)	50.8%	39.2%	53.1%					X	X
Provider Activities									
Give providers screening tool for this disorder (b,d)	60.9%	80.1%	57.1%	X	X				
Distribute or provide online practice guidelines for this disorder (d)	96.9%	95.2%	97.3%		X				
Reminders to providers regarding visit or medication follow-up (b,c,d)	91.7%	54.4%	99.2% [*]			X		X	X
Primary care physician hotline for psychopharmacology assistance (b,d)	53.3%	54.3%	53.1%		X	X			
Feedback to providers with patient-specific indicators of guideline adherence (c,d)	45.7%	36.5%	47.5%					X	X
Outcomes measurement with feedback to providers (c,d)	42.7%	24.1%	46.4% [*]					X	X

Disease Management Association of America. <http://www.dmaa.org>

Notes: Percents are based on non-missing data, missing <3%.

Chronic Care Model elements: a: Self-management support b: Delivery system design c: Clinical information systems d: Decision support

* p<0.05

** p<.01

Table 3

Characteristics Predicting Depression Disease Management Among Health Plans With Any Disease Management Program

Variable	Odds Ratio from Logistic Regression Model
<u>Product Type (ref group=PPO)</u>	
HMO	2.64 **
POS	1.87 **
<u>Behavioral Health Contracting (ref group = Internal)</u>	
Specialty Contract	3.06 **
Comprehensive Contract	4.39
<u>Region (ref group = West)</u>	
Midwest	0.84
Northeast	0.69
South	0.41 **
<u>Market Area Enrollment (ref group = <10,000)</u>	
Medium (10,000 to 50,000)	0.85
Large (>50,000)	2.76 **
<u>Profit Status (ref group = For-profit)</u>	
Not-for-profit	1.78 *

*
p<0.05

**
p<0.01