Does Managed Mental Health Care Reallocate Resources to Those with Greater Need for Services?

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Abstract

Evidence points to the existence of two coexisting inefficiencies in mental health care resource allocation: those with need receive too limited or no care while those with no apparent need receive services. In addition to reducing costs, managed mental health care is expected to reallocate treatment resources to those with greater need for services. However, there are no empirical findings regarding this issue. This study tests whether managed mental health care has had a differential impact by level of need. Data consist of three waves of a community sample with a control group. The study finds that managed care has not succeeded in reallocating resources from the unlikely to the definite "needers."

Introduction

Adoption of managed care for the mentally ill covered by Medicaid[1,2] is continuing, even with limited research on how managed care (MC) can benefit or adversely impact these populations. The evaluation of MC has centered on cost,[3] with limited emphasis on whether MC leads to a more rational use of resources.[4] From the beginning there has been concern that MC may lead to undertreatment,[5]

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mistreatment,[6] or absence of treatment[7] for vulnerable populations. Questions have arisen about whether cost containment has been partially accomplished at the sacrifice of access to health care for these populations.[8] Managed care requires new skills of providers and patients to successfully obtain authorization for services, and some vulnerable populations may be less able to voice their demands effectively. A patient easily discouraged may not be the patient for whom services are least valuable.

On the other side, health reforms associated with managed care are extending health insurance coverage to the previously uninsured,[9] which may aggravate another resource allocation problem in mental health, increasing demand by those without significant mental health problems. Both the National Comorbidity Study[10] and the Epidemiologic Catchment Area Study,[11] in a pre-MC era, found that approximately 43% to 45% of those using mental health services during a year did not fulfill criteria for a mental disorder. Such was the case in Tennessee's failed MC program, according to one study,[12] where funds previously targeted for severely mentally ill patients were distributed across the entire Medicaid population, contributing to system collapse. Underutilization of mental health services among vulnerable populations and over-utilization of care among the less seriously ill could indicate problems in the health care system.[13] Whether managed care can help with this issue remains uncertain.

The purpose of this study is to test for a differential impact of managed care on the use of mental health care for those with a "definite" and a "probable" need for mental health (MH) services in Puerto Rico, and to compare this effect with that of "unlikely" needers. It is important to investigate if managed care reallocates resources to those with greater need for MH services in the general population. The study is based on the assumption that this reallocation of resources improves the efficiency of mental health care and is therefore favorable.

The revised behavioral model of health services use[14] guides the present work. The model was previously tested to determine its ability to predict mental health service use for a low-income population.[15] According to this model, use of services is a function of individuals' predisposition to use services, their enabling resources, their level of need, and the organization and policies of the health care system. For the present work, while again following the model, the focus is on the role of system change. The emphasis is on trying to understand if system change from a government-owned public mental health system to a privately managed care system (under a risk contract) interacts with the need level of the individual to differentially affect mental health service use. Enabling and predisposing factors are thus treated as controls in explaining changes in mental health service use. This study is believed to be the first time the behavioral model has been used to examine how system and individual characteristics may or may not interact to differentially impact mental health care use.

The Anderson model is a demand-side model, mainly focused on explaining use from the client's side, not from the supply or service system side. The managed care literature was used to generate hypotheses of how managed care would impact service use, taking into account not only the demand side (such as the need level of the individual) but also the supply side. The literature suggested two hypotheses of how a change to managed care might interact with specific characteristics of the individual to explain differential probabilities of service use. First, in comparison to an open-ended, demand-driven system, managed care might improve the overall efficiency of funds by reallocating resources from unlikely to definite and probable needers.[16,17] Managed care's emphasis on services linked to "medical necessity" implies a system change that should increase the probability of treating those in need over those without apparent need. This would imply that even if managed care had, on average, no overall effect, it still may be reallocating *in favor of* those with greater need. Second (in contrast), managed care organizations have incentives to improve services to healthier groups, the unlikely needers, while under-serving the more costly[18] or definite needers in order to improve their risk selection and reduce their costs. In this second circumstance, MC would reallocate *against* those with greater need. This study is particularly concerned with

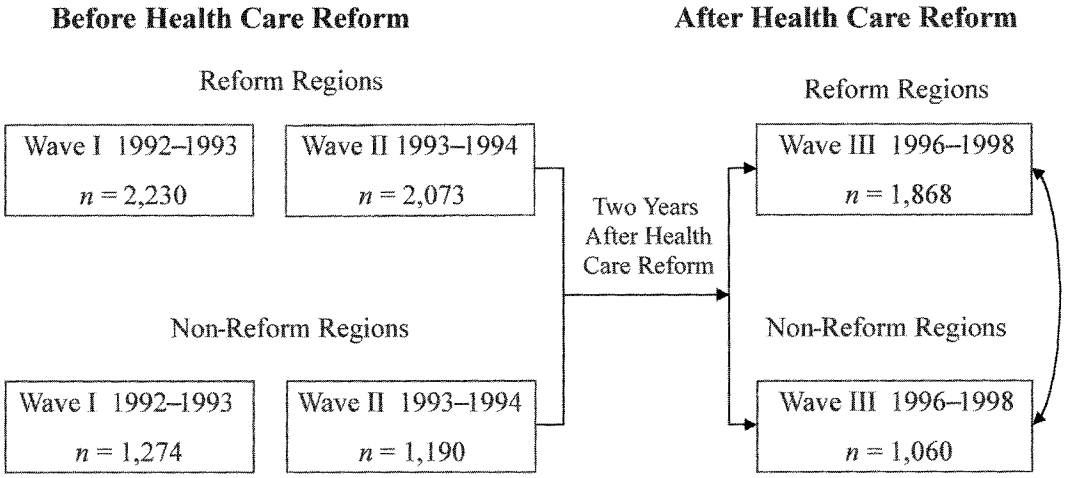
evaluating these hypotheses on whether MC reallocates in favor of or against those in need of mental health services.

Past research on the determinants of mental health service use suggests that need, as measured by psychiatric illness or comorbidity of psychiatric illnesses, is an important determinant of the probability of use and the extent of use.[19] Furthermore, managed care may have a mediating effect on the probability and extent of use of mental health services. Previous findings have shown that health maintenance organization (HMO) plans have a less intensive style of care for enrollees with "serious psychiatric disorders," with a lower mean number of outpatient visits to the specialty mental health sector than comparable private fee-for-service populations.[20] Schlesinger and Mechanic,[21] among others, expressed concern that persons with serious chronic mental illness would be especially vulnerable to service cutbacks in managed care. Even if care is managed effectively, the cost and use of services for those individuals are likely to persist over time, making these enrollees less desirable by health plans.[22] This might be the rationale of why a majority of HMOs do not cover chronic mental illness in their standard plan for private enrollees.[23] In fact, discouragement of enrollment in HMOs by persons with serious mental disorders has been reported since the early beginnings of managed care[24,25] and still continues to be a concern.[26] Yet the behavioral model suggests that an individual's level of need drives the demand for care while, at the same time, the health care system has policies that operate to curtail demand depending on the characteristics of the individual (ie, insurance, residence, eligibility).

Despite these allegations, some researchers[4] have found that managed care programs may enhance detection and increase treatments for those with chronic mental illness, specifically major depression. In fact, the Hennepin County demonstration[27] found slight improvements in access under prepayment systems, as compared with fee for service, among chronically mentally ill Medicaid beneficiaries. Dickey[3] reported that hospitalized patients appeared to be managed more appropriately, with lower hospital readmissions within 30 days of discharge, in the Massachusetts Medicaid managed care reform. In sum, the empirical literature leads to no clear conclusion about whether managed care is associated with a reallocation of resources toward or away from persons in greater need.

The current study includes data from three waves of a random probability community sample,[28–30] which provides a descriptive profile of users and nonusers. Using a quasi-experimental design with

Figure 1
Study design



two measurement periods before MC and one afterward (see Figure 1), use and number of visits to mental health services were collected before and after managed care in Puerto Rico. Many previous reports of the impact of managed care on mental health use have been subject to several important limitations including: (1) lack of systematic information about the access and mental health use patterns before managed care; (2) data from insurance claims, with few covariates and no information on nonusers; and (3) absence of a control group, so the impact of managed care must be identified by assumptions about time trends.

The research design features a control group, whereby about one third of the population of Puerto Rico was not under managed care and remained in the government-owned public health sector in the "post" period. The statistical work, employing difference-in-difference estimators, compares the time path of use in the areas subject to MC to the time path in the non-MC areas to identify the impact of managed care. Inclusion of epidemiologic and sociodemographic data allowed identification of the impact of managed care on the groups of special interest. In addition, the study tested whether the introduction of MC was associated with increased probability of use and greater number of visits for mental health services for those with greater need.

Puerto Rico's Health Care System before and after Managed Care

Puerto Rico has the fourth largest enrolled Medicaid population in the United States,[31] with 1.8 million recipients who annually consume $1.2 billion in government health expenditures.[32] Private and government-owned health sectors operated in Puerto Rico from 1960 through 1994. The public health sector, financed by a combination of Commonwealth funds and federal Medicaid contributions, provided public health services. Health providers in the public health sector were government employees or held a government service contract. The public health system was structured as having an open door policy for anyone who needed health or mental health care, with essentially no limitations in visits, except insofar as limited availability of providers' time or other resources rationed care. The private health sector operated as an informal network of services with referrals to psychiatrists and psychologists and to three private psychiatric hospitals. Private insurance commonly included coverage for 12 outpatient visits during a 1-year period. Typically coverage was restricted to the mental health professionals included in the provider network under contract with the insurance company. The private sector closely represented the fee-for-service sector operating in the United States.

In 1994, the Commonwealth of Puerto Rico established the Puerto Rico Health Insurance Administration (PRHIA), a public corporation charged with contracting for public health sector coverage from private health insurers. PRHIA requested proposals for providing managed health care to those with an annual family income 200% or less of the poverty level, veterans and their families, the police force and their families, and the "floating" uninsured population who complied with this criterion. As of 1997, there were 1.09 million beneficiaries enrolled under Medicaid managed care out of the 1.8 million Medicaid recipients. Due to the lag time in the implementation of managed care through health regions, non-MC regions, or approximately one third of Puerto Rico, remained under the public health care sector. Respondents in these areas served as the study's control group.

All private insurers in MC regions, except one covering 40,000 lives, chose to write a carve-out contract to a behavioral health care company for mental health services, mostly those with operations in the United States (eg, Options, Compcare). Capitation of mental health services was limited to $3.00 to $3.50 per member per month. Each contract specified that the following mental health services should be available to all enrollees: education and counseling; evaluation and treatment in mental health for individuals, couples, families, and groups; intensive ambulatory psychiatric services with a maximum of 21 visits per year; partial hospitalization with up to 30 days per year; screening for mental health conditions; psychiatric hospitalization with up to 30 days per year; substance abuse detoxification treatment and rehabilitation; and alcoholism and drug abuse treatment. Insurers were

required to enroll all applicants without discrimination for preexisting conditions or other factors. The contracted insurance plan had to issue the same cards given to their private clients covered under similar insurance plans, could not exclude any beneficiaries, or charge extra fees to covered clients.

Methods

Data

Data are reported on a random sample of adults (age 18 to 69 in 1992) living in low-income areas of Puerto Rico. Two waves of data of this multistage probability sample allowed study of the patterns of need and use of mental services in 1992 to 1993 and 1993 to 1994. From the end of 1994 through 1998, managed care was implemented in 7 of the 10 regions of Puerto Rico, allowing for a natural experiment. A third wave of data collection was undertaken in 1996 to 1998 to establish changes in these patterns 2 years, on average, after MC went into effect in the reformed regions. The sampling frame consists of clusters of housing units identified in the Census of Population and Housing Segments, selected from areas identified as low income by the Puerto Rico Department of Labor and Human Resources.[33] The classification of areas as low income is based on an index (that uses the area's median rent, median family income, and median housing unit value) developed by the US Department of Labor. Approximately 59% of Puerto Rico is classified as low income according to this index. Over 67% of the study respondents met the criterion for poverty as defined by the US Census Bureau. Annual household income (without government aid) in the sample ranged from $0 to $156,000, with a median of $9,600 and a mean of $13,892.

Eligible adults were identified in 4,027 units; of these, enumeration was completed for 96.1% (or 3,868 individuals). One adult per household was then selected using standard Kish[34] selection methods. From this sample a 90.6% interview rate was achieved, yielding 3,504 completed face-to-face interviews at baseline (1992 to 1993).[28] Two more waves of data collection were conducted based on the 3,504 individuals interviewed in wave I. In wave II, a total of 3,263 were re-interviewed (93.1%); in wave III 2,928 interviews were conducted. After excluding deaths, the overall response rate of the three waves was 81.5%. Respondents who dropped out or were not successfully contacted for the study from wave I to wave II ($n = 283$) or from wave II to wave III ($n = 433$) were more likely to be males, from urban areas, who had previously self-identified as returned migrants. The characteristics of respondents who remained in the study over the three waves were not different from those who dropped out in terms of other sociodemographic factors, level of any formal or specialty use, or level of need (see Appendix A).

Use of outpatient mental health services

Respondents were asked whether they ever saw a professional for problems with their mental health, nerves, or alcohol or drugs, and, if so, to identify any treatment received in the last year and the types of professionals seen. This information allowed coding of any last year mental health use and whether the treatment was obtained in the general health sector or the specialty sector. General health sector care was defined as treatment by a non-psychiatrist medical doctor regardless of setting other than a mental health setting. Specialty sector care was defined as treatment either by a psychiatrist, psychologist, social worker, or counselor or treatment by any other type of professional in a mental health setting (eg, hospital psychiatric clinic).

Need

Data included an extensive array of measures to assess need of mental health services. Need was operationalized in a similar way to the measure employed by Tweed and Ciarlo.[35] Alcohol,

drugs, or other mental health service need (ADM need) is based on four dimensions that rely on diverse measures: level of psychological distress; diagnosis of several psychiatric disorders; functional impairment in role performance and/or severity of underlying illness; and current illicit drug use.

Because acute symptoms and disability are highly related to most mental health service use,[36,37] two measures of psychological distress were included as part of the ADM need aggregate: the Psychiatric Symptom and Dysfunction Scales (PSDS)[15,38] and the Center for Epidemiological Studies Depression Scale (CES-D).[39] The PSDS can identify differential levels of mental health problems for Latinos and other ethnic groups on the mainland[38,40] and for Puerto Ricans on the island.[41] It is a psychiatric screening scale that evaluates symptoms of depression, anxiety, cognitive impairment, psychosocial functioning, and general psychopathology. The CES-D evaluates the presence of depressive symptoms during the previous week. It was selected as an additional measure of psychological distress due to its sensitivity and specificity.[42–47] A score of 23 or more (two standard deviations above the mean score) has been previously used to identify people in need of mental health services.[46]

Presence of one or more of the five, 12-month diagnosable disorders assessed in the study is the second dimension of ADM need. To limit the administration time of the interview, only disorders prevalent in the past year[48] and/or relevant to public ADM system priorities were included. The Spanish version of the Composite International Diagnostic Interview[49] (CIDI) was used to generate the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-III-R) diagnosis of major depression, dysthymia, alcohol abuse, and/or dependence. The Spanish version of the National Institute of Mental Health (NIMH) Diagnostic Interview Schedule (DIS)[50] was employed to assess antisocial personality diagnosis according to DSM-III-R criteria. Shapiro and colleagues[37] argued that those who comply with an antisocial personality disorder group were in need of mental health services. Both CIDI and DIS have shown adequate reliability and validity for the Puerto Rican population.[29,49,50]

Functional impairment and severity of an underlying psychiatric condition comprise the third dimension employed to establish need for ADM services. Four items assessed functional impairment: whether the psychiatric symptoms disrupted the subject's ability to participate or manage usual daily activities at home or outside; whether they caused problems in his or her family life; whether the symptoms created problems in his or her social life; or whether they required the respondent to stay at home or in bed. Severity of mental health problems was based on three queries: the presence of any use last year of prescribed psychotropic medication, any lifetime history of psychiatric hospitalizations, or ever attempting suicide. The four impairment items and three severity questions were grouped under a 7-point scale. To identify the cut-off at which the number of positive responses would indicate presence of significant impairment and severity, the combinations of items that improved sensitivity and specificity for predisposing self-reported mental incapacity and use of formal mental health services were tested. Based on these analyses, a cut-off of two or more was identified as considerable impairment in functioning.

Using the measures described, an aggregate indicator of need for ADM services was developed. To be coded "definite" need, respondents had to positively endorse two or more impairment questions and comply with one of the following: (1) fulfill criteria for any of the five psychiatric diagnosis (ie, major depression, dysthymia, alcohol abuse, alcohol dependence, and/or antisocial personality), (2) score two standard deviations above the mean on all of the five PSDS scales, (3) score 23 or higher on the CES-D, or (4) self-report use of any hard-core drugs in the last 30 days. If an individual complied with any of these four indicators but had less than two positive responses to the impairment questions, he or she was classified with "probable" ADM need. Also included in the "probable" category were respondents who responded positively to two or more impairment questions and complied with one of the following: (1) scored two standard deviations above the mean on three or four PSDS subscales or (2)

scored 16 to 22 on the CES-D scale. All others were classified as "unlikely" needers of mental health services.

Other covariates

The choice of covariates was guided by the revised behavioral model of health services.[51–54] An extensive array of data was collected on factors related to mental health care use that could be employed as control variables. The sociodemographic control variables included age, sex, migration status, marital status, years of education, and employment status. Total annual family income was used to designate respondents as poor or non-poor. For each wave, the US Census Bureau definition of poverty for that year was employed to classify respondents as poor/non-poor (for a family of four—two adults and two children—this would be $14,654 in 1992, $15,029 in 1993, and $16,276 in 1997). Although the study population was selected from an island-wide sample of people living in low-income areas, approximately 30.9% of the sample did not comply with the definition of poverty according to the US Census Bureau.

Health care reform (HCR) was primarily intended for the Medicaid population or the medically indigent, but other non-poor groups also were covered under HCR. These are respondents with incomes of up to 200% above the poverty level, military veterans and their families, and the police force and their families. As a consequence, a segment of the non-poor also had access to managed care services offered under HCR.

Questions related to respondent's availability of private health insurance coverage also were added as covariates. Four clinical control variables found to be associated with mental health service use were considered: respondent's self-perception of mental health, respondent's self-perception of physical health, number of chronic physical illnesses, and presence of physical incapacity. Two separate questions asked about the respondent's general evaluation of his or her physical and mental health, with four potential responses ranging from poor to excellent. Number of chronic illnesses was assessed by a battery of questions requesting the respondent to identify whether he or she suffered any of the following conditions: asthma, diabetes, heart trouble, high blood pressure, arthritis/rheumatism, emphysema/bronchitis, stroke, cancer, neurologic condition, ulcer, or physical handicap. A count of chronic illnesses was computed for all conditions to which the respondent answered affirmatively. Physical incapacity was evaluated by a single question that asked whether the respondent had any physical incapacity or disability. Level of need is represented by two dummy variables: one classifies whether the respondent fulfills criteria for definite need and a second dummy variable on whether the respondent fulfills criteria for probable need with the unlikely needers being represented as the reference category. Table 1 contains information about the variables used in the analyses as well as their means or percent distributions and standard errors.

Statistical Methods

As previously stated, the focus of the analysis was on the change in the probability of use and the extent of use of mental health/substance abuse services for persons with the three levels of need as a result of introducing MC in Puerto Rico. First, the change in the unadjusted rates of service use in the regions that were under MC by level of need are compared with the change in the unadjusted rates of use in the regions that did not undergo MC by level of need. As a second step, a series of regression analyses tests the impact of managed care on needers, treating the data as coming from repeated cross-sections. Covariates are included to control for other factors affecting mental health service use, in addition to the impact of managed care. All valid responses, in any of the three waves of data, were used, for a total of 9,626 observations.

Statistical analysis of mental health care utilization data from a community survey must contend with non-normality in the distribution of the dependent variable. In health and mental health services

Table 1

Descriptive statistics of all variables used in the analysis for three waves of data (n = 9,695)

Variable	Mean or %	SE
Utilization		
Any formal use of MH services during last year	11.1%	0.5%
Specialty use of MH services during last year	8.1%	0.4%
Number of visits to any formal MH provider during last year	8.49	0.34
Number of visits to specialty MH provider during last year	7.63	0.34
Region and time		
Reformed region	64.9%	2.5%
Non-reformed region	35.1%	2.5%
Managed care	21.9%	0.9%
Wave I	33.2%	0.3%
Wave II	33.0%	0.2%
Wave III	33.8%	0.3%
Need		
Definite MH problems	12.2%	0.5%
Probable MH problems	11.4%	0.4%
Unlikely MH problems	76.4%	0.6%
Other covariates		
Age in years	40.1	0.37
Female	52.9%	0.9%
Islander status: Living on island without leaving for <6 months	75.5%	0.6%
Married	62.3%	0.5%
Divorced, separated, or widowed	16.3%	0.6%
Never married	21.4%	0.8%
Below poverty level	69.1%	1.0%
Employed	50.7%	0.5%
Unemployed	13.3%	0.5%
Out of labor force	36.0%	0.8%
Privately insured	11.7%	0.6%
Years of education completed	10.6	0.10
Self-perception of physical health as bad or poor	41.4%	0.8%
Self-perception of MH as bad or poor	21.5%	0.6%
Self-reported physical incapacity	19.2%	0.6%
Self-reported number of chronic illnesses	0.87	0.02
Previous user of MH care	20.9%	0.7%

SE, standard error; MH, mental health

research, the most common way to deal with this special distribution is to apply a so-called "two-part" model of utilization. (For a recent discussion of the two-part model commonly used in health services research, the reader is referred elsewhere.[55,56]) The first part of the model is a yes/no equation, usually a logistic regression, describing the probability that an individual has any formal use of mental health services during the designated time period. The second part is a least squares regression of extent of use that assesses the number of mental health visits estimated only with observations of users. The dependent variable also can be transformed in the second part by a logarithmic or square root transformation to account for skewness. A logistic transformation of the number of visits equation

was used that obtained qualitatively similar results in all cases; thus, only the untransformed results are reported.

The two-part model is estimated on three waves of data. Time trends are accounted for by two dummy variables: one for wave II (pre MC) and one for wave III (post MC), with wave I (pre MC) playing the role of a reference category. Regional differences are accounted for by a dummy variable indicating whether the respondent is in a reformed or non-reformed region. The impact of MC is captured by the estimated coefficient of an interaction between wave III (post MC) and being in a reformed region (managed care effect). This interaction term takes a value of 1 only in the reformed regions post-MC, implementing a difference-in-difference methodology within a regression framework. Both the first and second parts are estimated with standard errors using Taylor series approximation.[57] A series of interaction terms that accommodate the possibility of a differential effect of managed care on those with definite, probable, and unlikely need for mental health services is included. Because the measure of the managed care impact is itself an interaction term, allowing for a separate effect by need group requires inclusion of the full set of two-way interactions, as well as the three-way interaction to study the differential effect of managed care by need. This is done for each dimension of need.

Results

The final study report finds that the overall impact of MC on rates of use was not significant.[57] However, a large "main effect" of need was found. Both the indicators for definite need and probable need are positive and significant in all regressions. The odds ratio (OR) for definite need in a logistic equation for probability of any formal use is 4.30 (data not shown), for example, indicating that in comparison to a person with unlikely need, the definite needer is four times more likely to use any formal mental health services in a year. Main effects, however, do not bear on the issue of whether there is a differential effect of managed care according to level of need. This must be investigated with the use of interactions.

The unadjusted rates of any formal mental health service use stratified by level of need are presented for reformed and non-reformed regions for the three waves of data (see Table 2). Although the distribution of need remains fairly constant across waves, there is a downward (not significant)

Table 2

Percent distribution of need level by use of outpatient mental health services for respondents in reform and non-reform areas across the three waves of data

	Wave I		Wave II		Wave III	
Regions	Need %	Any formal use %	Need %	Any formal use %	Need %	Any formal use %
Reform: Level of need						
Unlikely	77.7	6.2	77.9	4.0	77.0	4.1
Probable	10.8	23.7	11.0	20.9	10.3	17.2
Definite	11.6	48.6	11.1	49.4	12.7	42.0
Non-reform: Level of need						
Unlikely	73.3	7.2	73.2	4.6	76.2	5.4
Probable	13.8	13.5	12.9	12.6	11.5	9.4
Definite	12.9	37.3	13.9	39.2	12.3	34.2

Table 3

Impact of managed care on use of outpatient mental health services by assessed need: Odds ratio (OR) for use of any outpatient formal mental health services and any specialty services for all respondents in any wave (n = 9,695) and beta coefficients for any formal visits and any specialty visits per user

	Probability of formal use (OR)	**Any formal visits per user (Beta)**	**Probability of any specialist use (OR)**	**Specialist visits per user (Beta)**
Managed care effect	0.90 (0.49–1.65)	−0.23 (−0.11)	1.36 (0.66–2.80)	−0.61 (−0.27)
Managed care* probable need	1.14 (0.39–3.32)	−2.14 (0.46)	1.13 (0.33–3.83)	−2.34 (−0.47)
Managed care* definite need	1.17 (0.48–2.86)	0.45 (0.16)	0.65 (0.24–1.71)	0.76 (0.25)

Ninety-five percent confidence intervals in parentheses for odds ratios or t values for both coefficients. Results are based on logistic regression (for probability of any formal use or probability of any specialty use) or multiple regression (for number of formal visits or specialty visits) that adjusted for poverty status, age, sex, migrant status, marital status, employment status, education, self-assessed physical health, self-assessed mental health, physical incapacity, private insurance, chronic illnesses, definite and probable need for mental health services, private insurance, and previous use.

*Represents an interaction effect.

trend in the rates of any formal use for probable and definite needers in both regions. The rates of use for definite needers in reform regions decreased from 49% to 42% after MC. However this decreasing trend in the rates of use for definite needers also is observed in non-reformed regions (from 37% and 39% to 34%).

Table 3 contains the results of a set of regression analyses in which the three-level measure of need was interacted with the effect of managed care. Only the coefficients bearing on the test of the differential effect of managed care by need group are shown. Estimates from Table 3 are consistent with the null hypothesis that managed care effects are uniform across need. The first row is the effect of managed care for persons with unlikely need. The second and third rows constitute tests of a differential impact of managed care on probable and definite needers, respectively, in comparison to the effect for the unlikely needers. Regarding only the size of the estimated coefficients in the first column of Table 3, managed care makes it less likely for an unlikely needer to receive any formal services and more likely for both a probable and definite needer to receive formal care. The signs are thus consistent with the idea that managed care reallocates services to more needy groups. However, none of the estimates in the table are statistically significant. With regard to probability of specialty use, the pattern of effects is consistent with the opposite effect (managed care making it less likely for a definite needer to see a specialist), but these results are also not statistically significant. None of the effects in terms of any formal or any specialty visits are significant (this refers to the second and fourth columns). Thus, overall, in this case there is no evidence that managed care has succeeded in reallocating resources from the unlikely to the definite needers. For the complete results of regressions depicted in Table 3, refer to Appendix B.

Discussion

Puerto Rico is special in some important ways, limiting the generalizabilty of the results for people on the mainland. Puerto Ricans are predominantly Spanish-speaking people and typically poorer than

people on the mainland. As a Commonwealth, the island has a cap on the federal payments Puerto Ricans may receive under Medicaid entitlements programs.

Additional caveats are in order. The data do not contain large numbers of seriously ill individuals who are institutionalized or homeless, but do include approximately 12% of respondents who qualified as definite needers, with significant impairment. In Puerto Rico, less than 2% of the population reports a psychiatric hospitalization in a 1-year period, suggesting that the absence of this group might not dramatically alter results. Although no significant effect of managed care on the definite needers was found, it is not right to rule out the hypothesis that managed care might have an effect on persons with chronic mental illness who, because this was a community sample, were not part of the study. Furthermore, it is worth keeping in mind that this comparison was based on a community sample across regions. Most managed care studies compare enrollees in non-MC plans and examine the effects of managed care pre and post. No one in the current sample was actually in the MC plan. It could be that the effect of MC is intertwined with other changes simultaneously occurring for the privately insured outside of managed care.

However, there are many reasons for a mainland audience to be interested in results of the application of managed care to Puerto Rico. Health care reform in Puerto Rico follows the same objectives of other state reforms of decentralizing health care from the state governments and privatization of health care services to improve access and quality as other state Medicaid programs. This leads to a belief that the managed care effects observed in Puerto Rico may be similar to other managed care initiatives in the public health sector of other states. Of greater importance is the finding of the limited impact of system change to reallocate resources according to need level in the population. The revised behavioral model of health services use[14] implies that enrollees' need level would interact with system change. However, change may improve allocation of resources in favor of those with greater need, or given incentives to recruit the healthier groups, work against those with greater need. The findings illustrate a crucial lesson that is potentially relevant to state reforms institutionalizing system change to increase access and quality of public mental health care. Demand for health care, mainly driven by an individual's need level, will be minimally altered by system change (or supply side controls) unless system change realigns incentives for care on the basis of enrollees' need level. The failure to detect any significant change in use according to need appears to be linked to incentives sustaining the status quo with managed care.

Implications for Behavioral Health Services

Equity in mental health care requires that health care systems take into account the varying levels of need within the population and distribute resources accordingly.[59] The shift from public provision of mental health services for Medicaid beneficiaries to a managed care program was expected to improve equity in mental health care with increased service provision for needers. If those with greater need benefit more from services, a reallocation according to need improves efficiency as well. The results suggest that there is no better allocation under the current system than under the previous public health system.

Health reforms are instituted with the assumption that they improve efficiency. But little effort is expended to evaluate whether system change, in the form of policies and organizational changes of managed care, actually accomplishes a more efficient allocation. This study's importance lies in evaluating whether change from public sector care to private managed care achieves a better allocation of resources using as a criterion the allocation according to need. All states as well as Puerto Rico, given the limited potential increase in funding for mental health care, should be interested in not only the supply side of health care but also the demand side. If we are to reduce costs and at the same time improve mental health, only a better allocation of services, rather than a reduction or control of services, might be the key.[60] This seems particularly relevant in the United States where health expenditures are roughly twice those of other developed countries[61] and medical demand, rather

than medical need, seems to consume many of these resources.[62] If the goal of managed care is to increase quality and cost-effectiveness of services, attention should be given to what are going to be the criteria for an equitable allocation of services to improve mental health and decrease need within the same level of funding. Yet reforms in health care delivery have aimed at providing care more efficiently by the management of the supply side but without a clear paradigm of what should guide management to improve this allocation. For example, Kloss[63] found that utilization of services in managed care did not seem to be strongly related to diagnosis, reported severity of symptoms, or reduction of symptoms. These findings question what it is that is driving utilization in managed care. Variations in demand for medical care seem huge,[64] with observed differences at the provider level and at the geographical level apparently more linked to medical capacity and market forces in a region than to need levels.

Thus, key questions among policy makers, administrators, providers, and consumers are: How should services be allocated? On the basis of what criteria should services be granted or denied? and Which individuals should be prioritized for treatment? Several models of service allocation have been proposed in the literature[60,65–67] but they have not been operationalized in programmatic policies in managed care environments. The lack of directives on what should drive service delivery in managed care, if not need, shows how system change may not accomplish a more efficient allocation of resources. The absence of financial incentives for managed care companies to identify and service the more needy clients and the difficulty of screening out nonneeders of services in an inexpensive and scientifically accurate manner might make it difficult to change the status quo in service allocation. In order to alter this status quo, two proximate goals should be considered by state payers: (1) reduce medical demand that is not medical need and (2) realign monetary incentives to increase identification and treatment of the more needy populations.

One alternative to reduce medical demand might be the provision of consumer education on self-efficacy and self-management to maintain well-being in the absence of need.[61] Data from several studies[68–69] demonstrate how this approach in general health was able to decrease professional service use by 16% to 40%. Intervention research that might prove cost-effective for self-efficacy and self-management of mental health conditions is badly needed. Research also is needed on how to create such programs within contracts that are typically focused on curative models of mental health.

A second complementary alternative to improve service allocation in managed care is to increase identification and service delivery of the more needy enrollees by cost sharing for such treatment. To be eligible for cost sharing, the managed care company would have to prove an established level of need in its consumer population and billing for those visits. Such cost sharing is in fact common in carve-out contracts in mental health going by the name of "partial capitation,"[18] though a case in which cost sharing is targeted to the higher need groups is not apparent. For the managed care company, it would be less financially burdensome or possibly financially neutral to identify such consumers and treat them. Also, it would be appropriate to provide incentives for those companies that demonstrate better resource allocation in the form of a compensation bonus. To determine eligibility, the state would monitor the variability of care to make sure that intensity of care was linked to the level of need rather than uniformly distributed[70] throughout the user population. Through utilization review, penalties would be enforced for high rates of untreated mental illness and for repeatedly documented inadequate or minimal treatment to needy enrollees.

Monitoring an efficient reallocation of resources for Medicaid beneficiaries under managed care needs to be a priority for state payers. Only then can states be in a better position to ensure that need is a driving force in the allocation of resources. Criteria for evaluating the progress in a better redistribution of care on the basis of need should be stipulated as part of the contracted language with carve-out arrangements in managed care. Managed care holds the promise of greater

efficiency and equity in mental health care delivery; more work needs to be done to redeem this promise.

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Appendix A

Characteristics of Respondents Who Remained in the Study for the Three Waves as Compared with Those Who Dropped Out from Wave I to Wave II or from Wave II to Wave III

	Remained in all waves ($n = 2{,}788$)	**Dropped out from* wave I to wave II ($n = 283$)**	**Dropped out from wave II to wave III ($n = 433$)**
Age			
18–24	12.80	14.13	15.24
25–34	27.47	26.15	24.71
35–44	25.25	26.15	21.02
45–54	17.75	20.14	16.86
55–64	14.10	12.01	18.48
65+	2.62	1.41	3.70
Sex†			
Male	38.09	50.88	48.27
Female	61.91	49.12	51.73
Zone†			
Rural	46.66	35.69	37.88
Urban	53.34	64.31	62.12
Marital status			
Never married	20.23	19.43	22.92
Married	62.20	62.54	58.33
Disrupted marriage	17.58	18.02	18.75
Employment status			
Employed	49.21	48.41	44.11
Unemployed	13.41	16.25	14.55
Out of work	37.37	35.34	41.34
Education			
0–12	70.48	71.73	75.75
13+	29.52	28.27	24.25
Migration status†			
Returned migrant	34.51	45.94	43.42
Nonmigrant	65.49	54.06	56.58
Poverty level			
Non poor	30.67	32.16	26.33
Poor	69.33	67.84	73.67
Mental health problem			
Definite	11.91	11.31	16.63
Probable	11.98	11.66	10.16
Unlikely	76.11	77.03	73.21
Formal use			
No	86.94	85.87	86.61
Yes	13.06	14.13	13.39
Use of specialist			
No	90.82	90.46	89.15
Yes	9.18	9.54	10.85

*Some respondents who dropped out or were not followed from wave I to wave II were re-interviewed in wave III.

†$p < .001$ for χ^2 test

Appendix B

Complete Results of Regressions Depicted in Table 3—Impact of Managed Care on Use of Services by Assessed Need: Odds Ratio (OR) for Use of Any Formal Mental Health and Any Specialty Services for All Respondents (n = 9,695) and Beta Coefficients for Any Formal and Any Specialty Visits Per User

	Probability of any formal use (OR)	**Formal visits per user (Beta)**	**Probability of any specialist use (OR)**	**Specialists visits per user (Beta)**
Managed care effect	0.90 (0.49–1.65)	−0.22 (−0.11)	1.36 (0.66–2.80)	−0.61 (−0.27)
Reform areas	0.84 (0.62–1.14)	−1.10 (1.06)	0.02* (0.01–0.05)	−1.90 (2.65)
Managed care* probable need	1.14 (0.39–3.32)	−2.14 (0.46)	1.13 (0.33–3.83)	−2.34 (−0.47)
Managed care* definite need	1.17 (0.48–2.86)	0.45 (0.16)	0.65 (0.24–1.71)	0.76 (0.25)
Wave II	0.71* (0.58–0.86)	1.72* (2.48)	0.74* (0.61–0.90)	1.080* (2.34)
Wave III	0.75 (0.49–1.16)	1.92 (−0.66)	0.63 (0.37–1.05)	0.18 (0.10)
Poor	1.00 (0.80–1.27)	1.23 (1.50)	1.10 (0.81–1.48)	1.44 (1.71)
Age in years	0.99* (0.98–0.99)	−0.86 (−1.19)	0.98* (0.97–0.99)	−0.80 (−1.08)
Female	0.86 (0.70–1.06)	−0.85 (−1.19)	0.66* (0.52–0.83)	−0.80 (−1.08)
Islander	0.87 (0.72–1.06)	−0.87 (−1.19)	0.85 (0.67–1.09)	−0.98 (−1.23)
Disrupted marriage	1.35* (1.06–1.71)	0.14 (0.20)	1.26 (0.94–1.70)	−0.47 (−0.57)
Never married	0.94 (0.73–1.22)	0.83 (0.99)	1.06 (0.78–1.43)	0.62 (0.72)
Unemployed	1.15 (0.83–1.58)	−1.05 (−0.92)	1.30 (0.88–1.90)	−0.77 (−0.60)
Not in labor force	1.87* (1.46–2.38)	−0.25 (−0.26)	2.13* (1.63–2.80)	−0.360 (−0.32)
Education in years	1.05* (1.02–1.08)	0.10 (0.02)	1.05* (1.01–1.09)	−0.02 (−0.15)
Self-assessed poor physical health	1.15 (0.91–1.46)	−0.02 (−0.02)	0.97 (0.74–1.27)	0.02 (0.02)
Self-assessed poor mental health	1.65* (1.29–2.11)	0.79 1.14	2.18* (1.68–2.84)	0.25 (0.29)
Physical incapacity	1.69* (1.36–2.10)	2.05* (2.38)	1.90* (1.49–2.42)	1.33 (1.31)

Appendix B
(continued)

Private insurance	1.09	−0.08	1.09	−0.69
	(0.88–1.35)	(−0.10)	(0.85–1.38)	(−0.86)
Number of chronic	1.13*	0.35	1.08*	−0.10
illnesses	(1.05–1.21)	(1.40)	(1.01–1.15)	(−0.44)
Definite need for	3.58*	2.29	2.29*	1.26
mental health	(2.34–5.49)	(1.48)	(1.53–3.42)	(0.78)
Probable need for	1.16	2.18	1.12	1.86
mental health	(0.69–1.95)	(1.08)	(0.70–1.78)	(0.69)
Private insurance*	0.99	2.49	1.12	2.02
reform areas	(0.64–1.54)	(1.58)	(0.66–1.90)	(1.50)
Previous use	8.55*	3.19*	8.65*	2.94*
	(7.02–10.41)	(4.71)	(6.90–10.84)	(3.95)
Definite need*	1.56	−0.55	2.08	−0.12
reform areas	(0.95–2.56)	(−0.32)	(1.26–3.45)	(−0.07)
Definite need*	0.66	1.73	1.10	−0.12
wave III	(0.33–1.32)	(0.76)	(0.52–2.35)	(−0.07)
Probable need*	2.43*	0.79	1.80	0.66
reform areas	(1.34–4.41)	(0.33)	(0.92–3.51)	(0.24)
Probable need*	0.73	1.43	1.09	1.05
wave III	(0.31–1.71)	(0.35)	(0.40–2.93)	(0.33)

Ninty-five percent confidence intervals in parentheses or t values. Results are based on logistic regression (for probability of any formal or probability of any specialty use) or multiple regression (for number of formal visits or specialty visits).
*Represents an interaction effect.