Contract No.: 100314
MPR Reference No.: 6175-400

MATHEMATICA
Policy Research, Inc.

Evaluation of the Medicaid Value Program: Health Supports for Consumers with Chronic Conditions

Managed Health Services Case Study

August 14, 2007

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MANAGED HEALTH SERVICES' MVP PROJECT

Managed Health Services (MHS), Wisconsin's largest Medicaid health plan, is a for-profit health maintenance organization (HMO) that has provided health care services to Medicaid and BadgerCare recipients (children and parents) in central and southeastern Wisconsin for 20 years. In April 2005, MHS began providing services to Medicaid SSI clients in Milwaukee County.[1] For the Medicaid Value Program (MVP), MHS compared two health risk assessment tools used to determine case management placement for SSI clients: a Predictive Risk Report (PRR) based on historical claims data, and the state-required Health Risk Assessment (HRA), a telephone-based interview tool (that some have criticized for its burden and cost). MHS began using the PRR for case management decisions in April 2006. The project team studied the association of these tools with case management placement for 3,000 SSI clients enrolled from April to November 2005, using multivariate regression analysis.[2] MHS also conducted a factor analysis of HRA data to investigate whether it would be possible to reduce the number of HRA questions and still retain pertinent information needed for case management placement. In addition, while the emphasis was on case management decisions, MHS also studied the relationship between case management and patient hospitalizations and emergency room visits.

The HRA and PRR assess patients' health risk through different means. The HRA is a questionnaire administered to Medicaid clients by telephone after enrollment (as required by the state of Wisconsin for all Medicaid managed care enrollees).[3] Patient-reported responses are then used to compute a risk score. MHS staff report that a major disadvantage of the HRA is that it can take as much as 45 minutes to complete. In addition, reaching SSI clients by telephone is often difficult because as many as 60 percent have either no telephone contact information or disconnected telephone numbers.

The PRR uses administrative claims data to provide estimates of future utilization and costs. The primary advantage of the PRR is that it identifies high-risk clients without having to assess risk or track down clients first by telephone, but it also has disadvantages. In particular, the PRR may not provide an up-to-date assessment of a patient's current health risk because there is a lag between claims' dates of service and the period when claims data are available. In addition, claims-based risk scores cannot be calculated if clients have no claims data available.[4] The differences in time frame between the two methods (with the HRA reflecting current health status and utilization and the PRR reflecting past utilization) also complicate the interpretation of the relative merit of the two approaches to risk assessment.

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[1] During the MVP grant period, MHS also began providing services to SSI clients in Racine, Waukesha, Kenosha, Washington, and Ozaukee counties.

[2] Because this project differs from the others in the MVP collaborative and is not an intervention per se, we do not include a logic model as part of this summary.

[3] Completion of assessments is mandated by federal regulation: 42 CFR Sec. 438.208(c), but not within a specific time frame after enrollment.

[4] For example, if clients were ineligible for Medicaid during the 12 months for which claims data are used to calculate the PRR.

Although Wisconsin Medicaid did not participate directly in this project, it did provide Medicaid claims data in-kind, which MHS used to calculate outcome measures for hospital and emergency room use. Wisconsin Medicaid also produced and distributed PRR data to MHS and the other plans that care for SSI Medicaid clients.[5] MHS staff noted that without Wisconsin Medicaid's support, "the project would not have been possible." Going forward, MHS plans to share the results of its study with Medicaid officials who MHS says are interested in learning about the use of the PRR to identify clients in need of case management.

DETAILS OF RISK ASSESSMENT TOOLS

Predictive Risk Report (PRR)

The PRR provides 21 measures of a patient's risk of high health care expenditures relative to other Wisconsin Medicaid SSI clients, all based on 12 months of Medicaid claims data.[6] Risk measures are calculated for the following:

- Ambulatory-sensitive conditions (diabetes, respiratory diseases, heart diseases, and gastric diseases)
- Mental health and substance abuse care (outpatient and inpatient treatment)
- Functional status (limited activities of daily living and instrumental activities of daily living)[7]
- Health care utilization (outpatient, emergency room, inpatient, and prescription drug use)
- Four summary measures:
  - The predicted level of health care expenditures in the next year
  - The predicted risk of having health care expenditures in the top 5 percent of all SSI clients in the next year

[5] For information on the design, production, and distribution of the PRR by the Wisconsin Medicaid program, see the interview with Mike Fox in Johnson, S, M. Lodh , M. Fox, L. Dunbar. "CHCS Network Exchange Call Summary: Current Applications of Predictive Modeling in Medicaid Managed Care." Center for Health Care Strategies, April 2005. Available at http://www.chcs.org/publications3960/publications_show.htm?doc_id=274475. Accessed June 16, 2007.

[6] MHS contracted with APS HealthCare (APS) to provide statistical consulting services for this project. The Wisconsin Department of Health and Family Services (DHFS) partnered with MHS in this study to provide Medicaid data, including the PRR, enrollment, and outcomes measures. APS is a specialty and behavioral medical care management company that has provided services to Wisconsin Medicaid for more than 10 years. Due to claims data processing lags, DHFS calculated PRR risk measures in April 2006 using data from October 2004 to September 2005. If patients were eligible for Medicaid for fewer than 12 months, DHFS calculated PRR measures using data only from the months in which patients were eligible.

[7] Screening for functional status is a requirement for patients participating in some health-related public programs in Wisconsin.

- The predicted risk of having an increase in health care expenditures from one year to the next that is among the top 10 percent of all increases
- The Chronic Illness and Disability Payment System (CDPS) score

For each risk measure, patients are assigned a "consumer percentile" and a "risk rating." The consumer percentile is a percentage from 1 to 99 that ranks that patient's risk relative to his or her peers (relative to all adults with disabilities in Wisconsin). The PRR assigns consumer percentiles above 75 percent a "high" risk rating, those between 50 and 75 percent a "medium" risk rating, and those below 50 percent a "low" risk rating.

Health Risk Assessment (HRA)

The HRA questionnaire collects patient self-reported data on disease state, function (for example, activities of daily living), utilization services (for example, how often the client visits a doctor), and dependency (for example, primary reason for client disability). HRA questions pertaining to a client's health care history, use of health care services, or self-care skills have a point value of 1, 20, or 100. (For example, the use of diabetic supplies at home is 20 points, and three or more hospitalizations in the past year is 100 points.) Point totals are reflective of a client's need for case management. Thus, major health risk indicators are assigned the largest point value: 100 points.[8] MHS sums all points for each patient and assigns scores of 400 or more a "high" risk rating, 100 to 399 a "medium" risk rating, and 0 to 99 a "low" risk rating.[9]

For MVP, MHS collected HRA data using a version of this tool that had been designed for the SSI population. However, as a part of MVP, MHS also investigated the possibility of reducing the number of questions in the HRA to decrease the amount of time associated with data collection. Based on an analysis of item correlation between the HRA and PRR, MHS reduced the number of questions in the HRA from roughly 56 to 31, a reduction of nearly 45 percent.[10] MHS began implementing the new HRAs in December 2005 and, though it did not directly measure the amount of time each took, staff noted that there was a reduction in HRA completion time. The data included in this report represent data collected from the initial version of the HRA, not the updated one.

The newest version of the HRA, like the previous version, still includes areas that are mandated to be collected by the state of Wisconsin. These areas include diagnosis and health-

[8] Five responses are valued at 100 points each. Three of them are for activities of daily living (client requires help with taking medications, eating, or using the bathroom), and two are for health care utilization in the past year (three or more hospitalizations or three or more emergency room visits).

[9] NurseWise collects HRAs for MHS. Like MHS, NurseWise is a subsidiary of the Centene Corporation, a managed care organization with Medicaid HMOs in Indiana, New Jersey, Ohio, Texas, Georgia and Wisconsin. NurseWise provides a broad range of health-related services including Nurse Advice Line for triage, approval of urgent pharmacy refills, transportation for treatment, and crisis interventions.

[10] Some questions on both versions of the HRA contain multiple parts. For example, one question asks if patients have ever been told by doctor that they have one or more of eight medical conditions.

related services, mental health and substance abuse, demographic information (ethnicity, education, living situation/housing, and legal status), instrumental activities of daily living, overnight care, communication and cognition (ability to communicate memory), indirect supports (family, social and community network), general health, and life goals.

USE OF RISK ASSESSMENT TOOLS BY MHS

MHS used both the HRA and PRR to make case management decisions for SSI clients. From April 2005 to March 2006, MHS used the HRA exclusively and began using the PRR as its primary assessment tool thereafter. Patients with a high HRA score received first priority for case management placement. Patients who were hospitalized or referred by providers were also high priority candidates for case management, regardless of HRA score. Also regardless of HRA score, patients with established social support services (for example, personal care assistants) were not always placed by MHS into case management if the member was being well supported and had no other identified needs.

Beginning in April 2006, MHS began using PRR data and other available hospitalization data to identify the need for case management. Specifically, MHS used the PRR risk measures for inpatient hospitalization and emergency room use, but not any of the summary risk measures. In addition to using PRR risk scores, MHS also used any available information on recent member hospitalizations to make placement decisions. (HRAs were also used if they were completed.) MHS collected up-to-date hospital admission data from daily inpatient census reports and nurses' rounds that occurred twice a week. Patients with either a high risk rating on the PRR inpatient admission risk measure or a recent hospital admission (regardless of their PRR risk) were automatically assigned to case management. MHS used the PRR emergency room risk measure as an additional determinant of case management placement; patients with high risk on this measure received first priority. MHS switched its approach for making placement decisions—from using HRA data to using PRR data—because of the difficulty in contacting members by telephone, resulting in long lags between patient enrollment and a case management placement decision. However, placements made with PRR data are not included in the project's analyses of the association of PRR and HRA scores to case management placement.

MHS planned to continue using PRR risk scores to identify patients for case management placement after the end of MVP, as it feels the PRR focuses its placement efforts more effectively than the HRA. Moreover, MHS has encouraged the state to consider using PRR information on other plan populations, such as BadgerCare recipients. As mandated, MHS will continue to collect HRA data as well, but staff believes that PRR data will allow the plan to prioritize its data collection efforts on clients with the highest risks of future health care use.

STUDY POPULATION

For MVP, MHS studied the association of PRR and HRA scores to case management placement for 3,000 SSI Medicaid clients enrolled in the program between April and November

of 2005 (Figure 1).[11] HRA data were collected through March 2006 and PRR data were calculated in April 2006 using Medicaid claims data from October 2004 to September 2005. As of April 2006, 38 percent of these SSI clients had both a PRR and an HRA completed (1,130 of 3,000 SSI clients, Table 1). MHS placed 42 percent of all SSI clients (1,264 patients) into case management, though only 10 percent (129 patients) had high HRA scores, highlighting the fact that MHS used more than one criterion to determine case management decisions, including referrals, hospitalizations, caseload, and client social supports.

FIGURE 1

MHS STUDY MILESTONES

Dates	Milestone
April 2005 to November 2005	SSI clients in study sample enrolled in MHS (3,000)
	Study examined case management placements that occurred for these patients through April 2006
April 2005 to March 2006	HRA data collected for SSI enrollees
April 2006	PRR data for all SSI clients obtained, based on claims data from October 2004 to September 2005

Source: MHS and APS HealthCare.

MHS = Managed Health Services; PRR = Predictive Risk Report; SSI = Supplemental Security Income.

From April to October 2006, when MHS began using the PRR to make case management decisions, MHS completed 211 HRAs (roughly 11 percent of the population; not shown). In addition, after switching from the HRA to the PRR to make decisions, MHS increased the number of members in case management by 90 percent (1,246 to 2,405 members), primarily because patient risk measures were more readily available. Almost 90 percent of the study population had at least a PRR completed by October 2006, while only 45 percent had an HRA, highlighting MHS's concern that HRA data collection is difficult due to poor contact information for members (data not shown).

Data provided by MHS suggests that among clients with both a completed HRA and PRR, only a small proportion of clients (6 percent) had both high HRA and high PRR scores, the primary decision point for prioritizing case management placement (Table 2). Roughly one-third of clients had PRR and HRA scores that were either both classified as medium or low risk. However, roughly 60 percent of patients had HRA and PRR risk levels that were different from each other and nearly a third of the sample had a high score based on one tool but not another. Because MHS identified clients for case management based on whether or not they fell into a high risk group, it might be informative for MHS to consider various cutoffs to define high risk

[11] Case management data represent whether or not MHS opened a case for a patient and not necessarily whether or not patients remained in case management for an extended period of time. Members move into and out of case management frequently due to loss of Medicaid eligibility and lack of interest in case management services.

for both the HRA and PRR, and examine if different cutoffs result in different case management placement decisions.

TABLE 1

HRA AND PRR COMPLETIONS, PERCENT IDENTIFIED AS HIGH RISK, AND PERCENT ENROLLED IN CASE MANAGEMENT

	All SSI Clients		SSI Clients Enrolled in Case Management	
	Number	Percent Identified as High Risk by HRA[a]	Number	Percent
Both HRA and PRR	1,130	10.9	837	74.1
PRR Only	1,525	n.a.	258	16.9
HRA Only	159	16.4	123	77.4
Neither	186	n.a.	46	24.7
Total with HRA	1,289	11.6	960	74.5
Total without HRA	1,711	n.a.	304	17.8
Total	**3,000**	**5.0**	**1,264**	**42.1**

Source: MHS and APS HealthCare.

Note: Includes all SSI clients enrolled from April 2005 through November 2005 with HRA completion and case management placement followed up through April 2006. HRA scores of 400 or more receive a high risk rating.

[a]Percent identified as high risk includes those with high HRA risk scores.

MHS also conducted statistical analyses to examine the association of HRA and PRR scores to case management placement.[12] When scores were unavailable for clients, MHS substituted the mean value of the HRA or PRR for missing values. This required imputation of the PRR score for roughly 10 percent of clients and the HRA score for about 55 percent of clients.

MHS chose to use the PRR CDPS score for its analyses even though it used other PRR risk scores to make case management placement decisions. The simple correlation between the HRA score and case management placement was estimated to be .07 while the correlation between PRR CDPS score and case management placement was .10. Both suggest that only about 10 percent of the time (or less) can we expect an HRA score or a PRR score that is above the sample mean to indicate that a client will be placed into case management, suggesting (as expected) that other factors also account for placement.

[12] This analysis excluded 278 patients who had a hospital admission before case management placement.

TABLE 2

HRA AND PRR SCORES AMONG CLIENTS WITH BOTH MEASURES

	Number	Percent
Clients with:		
High risk scores on both	70	6.0
High PRR risk, not HRA risk	305	26.0
High HRA risk, not PRR risk	60	5.1
Neither high risk, but equivalent risk levels[a]	377	32.1
Neither high risk and not equivalent[b]	361	30.8
Total	**1,173**	**100.0**

Source: MHS and APS HealthCare.

Note: Includes all SSI clients enrolled from April 2005 through November 2005 with HRA completion and case management placement followed up through April 2006. These data include some clients for whom HRA data was collected after April 2006, thus the total number with both measures is slightly larger than noted in Table 1. The PRR assigns consumer percentiles above 75 percent a high risk rating, those between 50 and 75 percent a medium risk rating, and those below 50 percent a low risk rating. HRA scores of 400 or more receive a high risk rating, 100 to 399 a medium risk rating, and 0 to 99 a low risk rating.

[a]Patients who have both a medium or low HRA and PRR risk score.
[b]Patients who had low risk on one score but medium risk on the other.

Multivariate regression analysis suggests that both the HRA score and the PRR CDPS score had a small association with the likelihood of case management placement.[13] Standardized regression coefficients for the HRA and PRR CDPS score, which were statistically significant, were both roughly 5 percent (Table 3).[14] These coefficients are standardized in the sense that they account for how widely the data are spread empirically from their mean—the standard deviation. Because the standard deviations of the HRA and PRR scores were large relative to their means, these coefficient estimates suggest that for every 10 percent increase in either score there will be about a half percent increase in the likelihood of case management.[15] The standardized coefficients for two other variables (whether the HRA score was imputed and number of months eligible) were also larger in absolute magnitude than the standardized coefficients for the HRA and PRR scores, suggesting that these variables have relatively more explanatory power than either of the two assessment scores.

[13] In addition to including the HRA and PRR CDPS scores in its multivariate regression analysis, MHS also used binary indicator variables for dual eligibility status, whether the HRA score was imputed, and whether the PRR score was imputed. MHS also included the number of eligible months for each patient as an explanatory variable. MHS used an ordinary least squares regression to model the likelihood of case management placement.

[14] This indicates that for every change in either the PRR or HRA score by one standard deviation, holding all other explanatory variables constant, the likelihood of case management increases by 5 percent of a standard deviation; where the standard deviation represents how widely spread data are from its mean.

[15] As reported by MHS on October 28, 2006, the mean HRA score was 210.6 and the HRA standard deviation was 97.2 while the mean CDPS score was 1.85 and the CDPS standard deviation was 1.90.

TABLE 3

REGRESSION COEFFICIENTS FOR LIKELIHOOD OF CASE MANAGEMENT PLACEMENT

	Coefficient	Standardized Coefficient	p-Value
Intercept	0.343	0.000	<0.0001
Imputed PRR score (0/1)	0.048	0.031	0.035
Imputed HRA score (0/1)	–0.596	–0.609	<0.0001
Dual eligible	0.005	0.003	0.860
Months eligible	0.031	0.129	<0.0001
CDPS PRR Score	0.014	0.053	<0.0001
HRA Score	0.000	0.055	<0.0001

Source: MHS and APS HealthCare.

Note: Includes all SSI clients enrolled from April 2005 through November 2005 with HRA completion and case management placement followed up through April 2006.

Limitations to Study Design

The analysis MHS conducted to examine the association of assessment scores to the likelihood of case management placement has limitations that warrant consideration. First, because HRAs are difficult to collect, HRA scores were imputed for more than half the research sample. While the method used to impute scores (mean substitution) was valid, the overall results might be strengthened by an analysis of the subset of clients with non-missing HRA and PRR scores. Second, while there was a slight association between the PRR CDPS score and case management placement, it is not clear that this association is relevant to MHS as it did not use the CDPS score to make placement decisions.[16] Rather, MHS used the PRR inpatient and emergency room risk scores, as discussed above.[17] Third, the MHS multivariate analysis includes assessment scores as continuous measures while case management placement decisions were made based on whether clients were classified as high risk or not. An analysis that examines whether binary indicators of risk are associated with case management placement would be informative to decision makers who use the binary value of this risk score rather than the continuous value. Fourth, MHS reported using information on social supports as a measure that helped to determine case management placement, but this variable that provides information as to how case management decisions were made was excluded from regression analysis.[18]

[16] CDPS scores and PRR measures on hospital and emergency room use are likely correlated to some extent.

[17] MHS did provide some analysis of the association of inpatient admission risk scores with case management placement during the grant period, but this analysis was not included in its final report.

[18] In the same analysis where MHS examined the association of inpatient admission risk to case management placement, it also included social support information. However, this also was excluded from the final analysis.

EFFECT OF CASE MANAGEMENT ON UTILIZATION

Upon enrollment into case management (regardless of the tool used for placement), all patients receive services from a team of health care providers, including a registered nurse, social worker, behavioral health clinical case manager, and program coordinator. This team also has support from MHS physicians, utilization review staff, and behavioral health specialists. A patient's lead case manager is selected based on that patient's primary health condition. Registered nurses are lead coordinators for clients whose primary conditions are medical, while behavioral health clinical case managers provide case management for clients whose primary conditions are related to mental illness or behavioral health. Social workers help with care coordination functions by providing assistance related to social issues, such as finances and housing. The program coordinators work with providers who provide literature requested by the members and contact members as needed to assist the case manager.

As of April 2006, MHS had three registered nurse case managers, one behavioral health therapist, one social worker and two program coordinators on staff to manage patients placed into its case management program.[19] The main services provided through MHS's case management program include care coordination and connecting patients to social services and other resources. As of April 2007, about 300 SSI clients were enrolled in complex case management. MHS staff reported that low case management staffing levels limited its ability to enroll additional clients. Ideally, MHS would like to staff enough case managers to manage as many as 600 clients.

In addition to examining the association of the two risk tools to case management placement, MHS studied the effects of case management services on subsequent patient hospitalization and emergency room visits. MHS conducted this secondary analysis for all of its SSI clients enrolled from April to November 2005. Thus, the intervention group consisted of clients enrolled in case management and the comparison group was those clients not enrolled in case management, regardless of risk at the time of enrollment.

Results suggested that the association of case management placement to patient outcomes was small, but statistically significant, for SSI clients enrolled in MHS. However, the analysis could be strengthened by a more appropriate comparison group, as the current group—MHS SSI clients without case management—is likely different from the intervention group on observable and unobservable measures. If MHS had access to the data, a more appropriate comparison might be SSI clients elsewhere in Wisconsin who are similar (in observable characteristics) to MHS clients enrolled in case management. With this type of comparison group, MHS findings would be more defensible as program effects. In the current analysis, MHS cannot distinguish program effects from overall trends in health care utilization among Wisconsin SSI clients.

[19] Before April 2006, MHS used one of its nurses primarily in a triage role to review HRAs and make recommendations for case management placement. However, once MHS began using the PRR to make case management decisions, it moved this nurse back to case management activities.

CONCLUSIONS

This project addressed a policy question important to many Medicaid policymakers: Can we identify clients in need of case management services more efficiently than through resource-intensive health risk assessments? Before this project, MHS's experience with identifying members in need of case management was similar to many other Medicaid agencies and health plans. Specifically, collecting information with telephone-based health risk assessments was time-consuming and could result in the delay of case management placement for patients in need. MHS believes that the data included in the PRR (coupled with easy-to-collect data on recent hospital admissions) offer an opportunity to identify members in need more quickly and efficiently before collecting HRA data.

Analysis suggested that HRA scores and the PRR CDPS score both had a small association with the likelihood of case management placement. Moreover, the association of case management placement to patient outcomes was also small, but statistically significant, for SSI clients enrolled in MHS. However, from the analyses conducted, it is not possible to infer whether the PRR adds as much information as the HRA to the case management placement decision. The analyses did not account for the specific manner in which HRA, PRR, and other (such as social supports) data were used to make placement decisions. In general, there are multiple factors that determine case management placement and analyses suggest that neither HRA nor PRR scores are critical factors, but MHS believes that both tools can be used to help form the decision. Because PRR data could be calculated by any Medicaid health plan or agency using Medicaid claims data, a study with a more focused design could be conducted elsewhere. In particular, an analysis of the association of risk scores to case management placement should, at the minimum, (1) consider the process in which case management decisions are made, (2) align the collection of self-reported assessment data with claims-based data, and (3) conduct key sensitivity analyses to confirm primary findings.