

High-Risk Population Health Management—Achieving Improved Patient Outcomes and Near-Term Financial Results

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Abstract

Objective: A managed care organization sought to achieve efficiencies in care delivery and cost savings by anticipating and better caring for its frail and least stable members.

Study Design: Time sequence case study of program intervention across an entire managed care population in its first year compared with the prior baseline year.

Patients and Methods: Key attributes of the intervention included predictive registries of at-risk members based on existing data, relentless focus on the high-risk group, an integrated clinical and psycho-social approach to assessments and care planning, a reengineered care management process, secured Internet applications enabling rapid implementation and broad connectivity, and population-based outcomes metrics derived from widely used measures of resource utilization and functional status.

Results: Concentrating on the highest-risk group, which averaged just 1.1% prevalence in the total membership, yielded bottom line results. When the

year before program implementation (July 1997 through June 1998) was compared with the subsequent year, the total population's annualized commercial admission rate was reduced 5.3%, and seniors' was reduced 3.0%. A claims-paid analysis exclusively of the highest-risk group revealed that their efficiencies and savings overwhelmingly contributed to the membershipwide effect. This subgroup's costs dropped 35.7% from preprogram levels of \$2590 per member per month (excluding pharmaceuticals). During the same time, patient-derived cross-sectional functional status rose 12.5%.

Conclusions: A sharply focused, Internet-deployed case management strategy achieved economic and functional status results on a population basis and produced systemwide savings in its first year of implementation.

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Several economic factors continue to encourage innovative clinical quality initiatives. After several years of moderation, medical costs are on the rise and currently outpace overall consumer and producer price increases. Although commercial health maintenance organization plans have been able to pass through price increases in many markets, such increases may not be enough to offset increasing utilization attributable to an aging population, new pharmaceuticals, and novel therapies.¹ Unanticipated medical expenses have led some plans to withdraw from Medicare risk products. Purchasers remain highly price sensitive, a situation that postpones an anticipated future in which health plans and at-risk delivery systems compete on the basis of clinical quality.²

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In this environment Health Management Partners (HMP), a medical services organization jointly owned by BJC Health Systems and Washington University School of Medicine, St. Louis, Missouri, sought to focus its medical management efforts on a clinical initiative that would quickly contribute to the financial bottom line. Health Management Partners has global risk and delegated medical management for some 75,000 members, 80% of whom are in commercial products and 20% in managed Medicare.

Health Management Partners has retained financial risk for both its commercial and senior membership since 1997 and has had full delegated medical management responsibilities from the insurer since November 1998. Pharmacy benefits for Medicare risk seniors are limited to \$500 yearly for branded drugs, with further coverage for generic medication.

Primary care physicians and many specialists practice in groups at multiple sites in the greater St. Louis metropolitan area and extending into southwestern Illinois. Inpatient and subspecialty care is provided preferentially within the Washington University Physician Network and the BJC Health Systems facilities. Inpatient admissions are the largest single cost element for HMP, as they are in plans nationally.

Several papers in the literature suggest that aggressive case management can have positive clinical

and economic outcomes in the managed care environment. One of the present authors published results with a conceptual predecessor program in a managed care organization (MCO) delivery system.³ Leveille and others showed the importance of participation by community-dwelling frail seniors in their own care, with resulting economic efficiencies in their needs for healthcare.⁴ A hospital-based nurse-practitioner program documented savings from reduced length of stay and readmissions for chronically ill adults.⁵ Meta-analysis of case management programs has shown that care planning must impact the coordination of medical care as well as psychosocial issues.⁶ The literature linking case management strategies to hard utilization outcomes is scant.⁷

Health Management Partners engaged StatusOne Health Systems, an Internet care management services company, to assist with creating the ambulatory case management strategy. StatusOne has worked with HMP throughout the implementation. Services include registries of high-risk patients and continuous updates; secured Internet software for managing cases and facilitating communications among case managers, physicians, and ancillary resources; training and certification of case managers; quality monitoring of the care plans; and cost, quality, and outcomes metrics. StatusOne also outsources the entire high-risk care program. Health Management Partners' implementation retained in-house case managers. This paper describes the essential elements and promising outcomes of this program.

Table 1. Attributes of the StatusOne Population

<ul style="list-style-type: none"> ■ By definition, at risk of high utilization within the following 12 months ■ 0.5%-1.0% included in the StatusOne registry ■ 12%-15% turnover per month due to deaths, a change in providers, or improved condition ■ 20%-30% of all admissions ■ 30%-45% of all inpatient days ■ \$2000-\$3000 per patient per month ■ 20%-25% of all medical costs ■ Comorbidities common; no one or several diagnoses predominate ■ Common cycle of isolation and subclinical depression leading to high utilization

... PATIENTS AND METHODS ...

Proactive Identification of Cases

Nurse care managers access a prospective, continuously updated registry of at-risk patients on a secured Intranet Web site. A proprietary predictive model generates the registry. The entire managed care membership is stratified into chronic disease indices corresponding to 8 major chronic illnesses. Members' patterns of care from the preceding 12 months are run against the predictive model. The patterns of care include diagnoses, place of service, order of service, occasionally absence of service, and pharmacy prescriptions. Neither age nor prior medical costs are used as input data. An earlier case study described the strategy, including concentration of case management effort on a predictive registry of members at high risk for developing clinical

complications and associated costs within the subsequent 12 months.³

The predictive model was developed and refined using population data from other MCOs in different parts of the country. In analyzing actual high utilizers, numerous combinations of leading and lagging indicators were tested empirically and developed into an optimal set of predictive patterns of care. Leading indicators used in the predictive algorithms mean data predictive of future events, such as oral steroid use by an asthmatic patient being used to predict unstable pulmonary function. Lagging indicators appear after an event occurs, such as a claim for hospital care. Combinations of these indicators, diagnoses, places of service, and order of occurrence comprise patterns of care useful in the modeling. As an example, people on dialysis would not be included in the high-risk registry simply by virtue of having renal failure, but rather many of them are included by virtue of their comorbidities, polypharmacy, vascular access complications, and use of high-acuity services.

This approach uses clinically related data to predict economic outcomes for members. The resulting prevalence of 0.5% to 1.0% accounts for 25% or more of medical costs. For this high-risk population medical expenditures average 15 to 20 times higher than capitation income.

Table 1 enumerates typical attributes of the high-risk group. The trends have been robust across health maintenance organizations and preferred provider organizations and across geographies in which hospital utilization ranges from “tightly” to “loosely” managed. Notable is the inherent instability of this high-risk patient group. Monthly turnover of 12% to 15% reflects a combination of deaths, departures from the risk pool, and clinical improvement associated with lower risk, balanced against entry of new patients who meet the StatusOne criteria.

Each month the entire managed care membership is profiled and evaluated against the predictive patterns of care. This process identifies the high-risk population. Input data cover up to the previous 12 months, a moving window of time that advances month by month, as well as a master index of chronic conditions. Output is captured in a standard query language server database residing on a secured server and made available to authorized users via a Web site as a registry of the highest-risk StatusOne patients. Registries of the other clinical conditions also are available for defining disease management target groups (Table 2).

Providers may add patients for intensive case management. These patients benefit from the same type of case management interventions offered to those high-risk patients identified by computer. Utilization metrics on the StatusOne patients do not include the added patients, due to the subjectivity involved in deciding to add or remove such patients.

Although some patients on the high-risk registry are already known to clinicians, many are not otherwise familiar to primary care physicians or other caregivers. Whether that is because of missed appointments, episodic care, or fragmentation of care among subspecialists, the net result is the same—too little opportunity for coordination of medical activities, proactive care, or knowledge of the patient’s goals and life situation.

Attributes of the High-Risk StatusOne Population at Health Management Partners

In the 12 months before the intervention (July 1997 through June 1998) the StatusOne population at HMP followed the pattern seen elsewhere.³ Prevalence was 1.1%, a bit higher than that observed elsewhere due to HMP’s relatively large senior membership. Baseline medical expenses for this group were \$2590 per member per month (PMPM) excluding prescription drug costs, which remained steady in the \$150 to \$200 PMPM range. Patients in this group were being hospitalized at a rate averaging 21.0% monthly.

Comorbidities were the rule rather than the exception (Figure 1). Psychosocial complexities, isolation, and subclinical depression were common and contributed to high utilization.

Table 2. Chronic Disease Indicators Grouped into Registries

■	Diabetes
■	Asthma
■	Chronic obstructive pulmonary disease
■	Neoplasms
■	Congestive heart failure
■	Coronary atherosclerotic cardiovascular disease
■	Chronic renal failure
■	Chronic, degenerative conditions

Approach to Care Management

The care management approach is an integrated clinical and psychosocial model. In addition to the optimal coordination of clinical care, the approach features building self-reliance and self-efficacy, attends to mental and emotional needs, and seeks to strengthen social supports and community ties. It is described at length elsewhere.⁸ Key aspects include assessments that identify the patient's goals, health actions developed with the patient according to individual readiness to change,⁹ and care planning for the duration of the patient's time in the highest-risk category.

Care management takes place predominantly in the ambulatory setting. Discharge planning (when hospitalizations occur) and home care services are provided as before, but with the high-risk case manager in an overall coordinating role. Public health nursing was not included in this program.

Conceptual aims for managing StatusOne members include ensuring the coordination of medical care, increasing self-reliance, enhancing daily activity and fitness, strengthening interdependence with family and friends, stimulating mental challenge, and encouraging community involvement and sense

of purpose. The latter 5 of these 6 aims tease out and make actionable the psychosocial aspects of a person's situation, aspects that have been shown to be critical, controllable aspects of healthcare utilization in the chronically ill.⁴ Care planning is patient centered and aspires to maintain client autonomy.¹⁰

Preparing to Manage Care Among the High-Risk Population at Health Management Partners

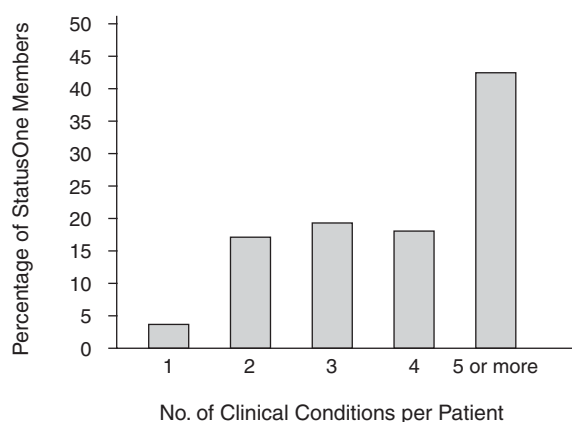
A number of activities preceded the actual management of cases. A project team consisting of key HMP clinical, administrative, and information technology leaders oversaw the project in its preparation and implementation phases. Tasks included preparing data abstracts, ensuring secured access to the Internet application, and orienting physicians and their staff to the role of case managers and the needs of the high-risk population. Additional tasks included redirecting existing personnel, hiring some additional care managers, identifying and incorporating clinical guidelines already in use, systematizing community resources to be used in care plans, and identifying experts on a variety of topics who would be available to advise case managers in problematic situations. The aim was to put people, equipment, communications, and supporting relationships in place before cases began to be managed in the new mode.

Training was important to lay a common foundation of best practices gleaned from around the country. An intense 2-day care management training program featuring a systematic approach to patient assessment, a continuing relationship with high-risk patients, contracting and patient involvement, and use of the Internet application software gave case managers a common knowledge base and provided a forum for sharing their prior experience. Periodic follow-up sessions identifying and propagating best practices among the care managers are augmented with an innovations forum in which the care management practices and experiences of HMP are shared with those of other organizations applying high-risk population health management.

Organizational Supports

In addition to the project lead team, charged with organizing activities before managing individual cases, existing leadership groups and clinical advisors also played key parts. The provider network leaders, including medical and administrative directors and lead physicians associated with the largest practices, were charged with disseminating information on the rationale behind health management for

Figure 1. Percentage of the High-Risk, StatusOne Population with Comorbid Chronic Illnesses



Data are derived from prevalent cases meeting StatusOne high-risk predictive criteria among the entire Health Management Partners population. The high-risk registry patients are grouped here according to the number of distinct comorbid diagnoses each one has.

high-risk populations and encouraging staff clinicians to meet and actively support the managed services organization care managers assigned to their regions.

Several of the physician leaders volunteered to serve as clinical advisors to high-risk care managers. They meet regularly for the purposes of standardizing care-planning activities among care managers, providing a medical sounding board for individual situations to supplement the primary care physician and involved specialists, and challenging barriers in the delivery system that the nurses are unable to breach.

In addition to suggesting organizational approaches, training, and technology, the consulting organization provides monthly metrics and confidential samplings of the care plans to support HMP's leaders in coaching their staff.

Technology

Computer technology plays a key role. The high-risk registry, care plans, and metrics reside on a secure server accessible through user authentication and secured, encrypted transmissions. Resource directories and clinical guidelines are available on the Web site, as are informal consultations and hot links to authoritative medical content sites on the Internet.

Technology start-up involved providing secured Intranet access for all care managers and clinical advisors, as well as channeling of input data feeds into a standard record format and a regular production schedule.

Program Costs

Staffing care management is the principal program cost, mitigated in part by redirecting personnel now working on more traditional precertification, utilization management, and concurrent review. A ratio of 1 care manager to 65 StatusOne patients is needed to maintain active plans. Twelve case manager full-time equivalents were assigned to manage the high-risk cases. Panels carried by the nurses averaged 65 (range, 56-98). Those refusing case management were a rarity. Coordination of clinical care proceeded in the background in these situations (for example, assuring that scheduled physician appointments were completed.) In the case of demented or incompetent patients, who were also a rarity, case management proceeded by enlisting the responsible caregivers and family. If a caregiver was absent and needed, obtaining one from available resources was integral to the care plan.

Additional costs are generated by the technological supports needed for the high-risk population

health management program. See the "Technology" section for a description of these supports.

Essential Metrics for Leadership

Program metrics were defined from the outset both to characterize the baseline situation and to monitor and direct the health management effort. An essential set of 6 metrics is used, updated monthly, and graphed automatically on the Web site using dynamic hypertext markup language.

Population-based metrics reflect the membership both in aggregate and segregated into subgroups. These metrics can be broken out into organizational regions and provider groupings. Metrics are cross-sectional prevalences, with the month-by-month figures representing an exact subset of the total plan experience. Cost avoidance estimates for individual cases, which are commonly done in case management,⁷ are not used.

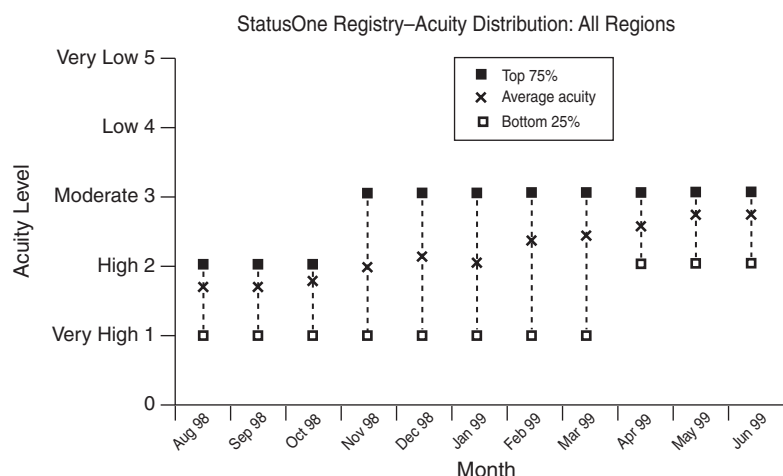
Metrics include both key process measures and utilization outcomes. Financial and utilization data are reported on the basis of claims paid, involving a delay compared with current program process statistics reported from the StatusOne registry and associated online care plans.

The StatusOne population prevalence, costs, and hospitalization rate are among the monthly utilization measures. They include everyone currently on the high-risk registry, as identified by the computer model, regardless of whether they were being actively case managed. Patients added to the high-risk registry by providers, typically an additional 10% to 15%, are not included in the StatusOne financial metrics, although their experience is included in the overall population metrics. The StatusOne population comprises the percentage of all HMP managed care members who meet the highest-risk criteria in a given month. Although patients continually come onto the registry while others leave each month, the statistic is useful for deploying case management resources to practices where they are most needed.

The highest-risk population cost PMPM is the paid claims during the month for all current StatusOne members divided by their number.

The hospitalization rate (which is never zero for such an unstable population) is the percentage of all StatusOne members admitted to an acute care hospital during the month. It is best thought of as a failure of ambulatory care. Measurable admission avoidance reflected in this figure because of proactive care means significant financial savings to the average health plan. StatusOne population preva-

Figure 2. Acuity Aggregate Measure of the High-Risk Population



lence, PMPM cost, and hospitalization rates are reported below through June 1999.

Process measures, which are available more quickly than financial and utilization data, reflect

key aspects of the care management process. Functional status is determined from the StatusOne functional status tool as reported by the patient during initial assessment and each time the care plan is updated. The assessment questionnaire covers areas comparable to those in the Medical Outcomes Study 36-Item Short-Form Health Survey,¹¹⁻¹³ but also includes the patient's goals. It also is used clinically in the evaluation of those already identified as high risk, rather than as a membership screening tool. Functional status is the patient's global assessment of his or her own health: "In general, how would you rate your health?" The scale is 1 (poor) to 5 (excellent). Over time, effective care

planning that engages the patients would be expected to increase that value. Conversely, introducing barriers to necessary care would be expected to decrease that value.

Table 3. Health Management Partners Overall Admissions per 1000—Hospital Utilization Quarter-to-Quarter Comparisons*

Commercial					Medicare Risk				
Baseline Quarter	Admissions/1000	Outcome Period	Admissions/1000	Variance [†]	Baseline Quarter	Admissions/1000	Outcome Period	Admissions/1000	Variance [†]
3rd Qtr 1997	50	3rd Qtr 1998	53	6.0%	3rd Qtr 1997	243	3rd Qtr 1998	257	5.8%
4th Qtr 1997	51	4th Qtr 1998	48	(5.9%)	4th Qtr 1997	260	4th Qtr 1998	252	(2.8%)
1st Qtr 1998	52	1st Qtr 1999*	44	(15%)	1st Qtr 1998	289	1st Qtr 1999	249	(14%)
2nd Qtr 1998	47	2nd Qtr 1999	44	(6.4%)	2nd Qtr 1998	272	2nd Qtr 1999	269	(1.0%)
Net Annual Impact				(5.3%)	Net Annual Impact				(3.0%)

*High Risk Population Health Management rolled out in 3rd quarter of 1998.

[†]Variance is the difference between inpatient admission rate after the intervention compared with the year-earlier baseline quarter. For example, commercial admissions were 48/1000 in the 4th quarter of 1998 compared with 51/1000 in the year-earlier quarter. The variance is an admission rate decrease of 5.9%.

Acuity distribution is a summary of triage decisions made by care managers for their panel of assigned StatusOne patients. On a 1 to 5 scale, acuity 1 is the care manager or physician's professional estimate of deterioration in condition and need for hospitalization within 3 months; acuity 2, within 6 months; acuity 3, within 12 months; acuity 4, within 1-2 years; and acuity 5, beyond 2 years. Acuities are established by the care manager during the assessment and updated as the situation changes. Figure 2 shows the mean prevalences among acuities in all care plans, including the 25th and 75th percentiles in a box plot. As care management of the high-risk patient group becomes effective, population mean acuities should improve. Functional status and acuity measures are derived from the most current assessment data among everyone on the high-risk registry.

Means of communication between case managers and physicians include face-to-face discussions, case conferences, and e-mail. E-mail subjects include specific clinical issues, access to care, and curbside consultations with identified experts in the organization. Use of e-mail by the provider network was uneven during the time frame we report on here. We are currently interested in counting and classifying provider encounters with the case managers. Such analyses are complex, and are a subject of our ongoing work.

To illustrate the overall impact on hospital utilization during the time period of the StatusOne implementation, authorization data for inpatient admissions are reported by quarter with prior year comparisons (Table 3). Inpatient admissions include acute medical/surgical, obstetric, neonatal, and psychiatric admissions. Skilled nursing facility and rehabilitation admissions were not included in either baseline or outcome periods. Quarter-to-quarter result comparisons mitigate seasonality and month-to-month variation.

... RESULTS ...

The care-planning process was introduced to providers starting in the second quarter of 1998.

Individual care plans were put in place over the third and fourth quarters of 1998. The prevalence of the high-risk population averaged 1.1% over the course of the implementation (Figure 3). Anecdotes

Figure 3. Month-by-Month Prevalence of the High-Risk Population

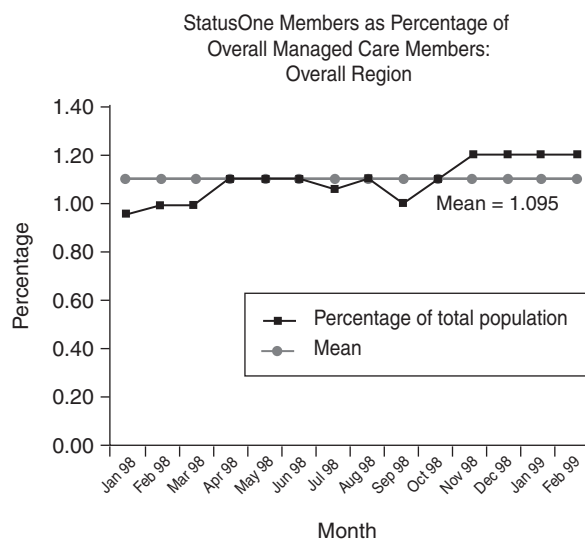
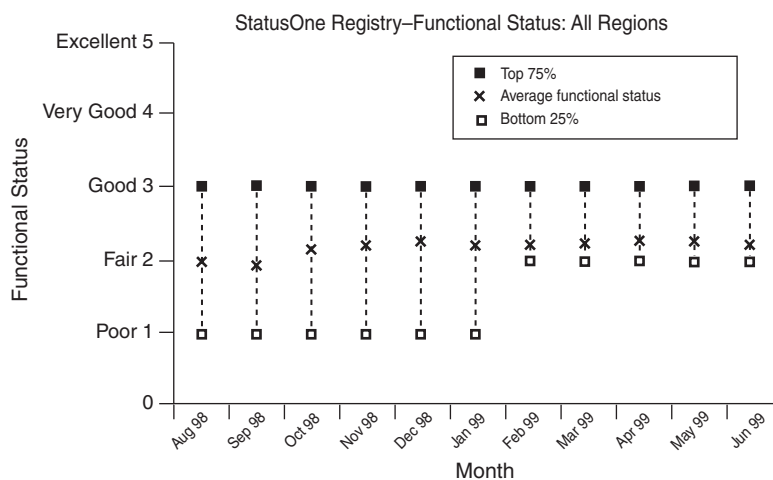


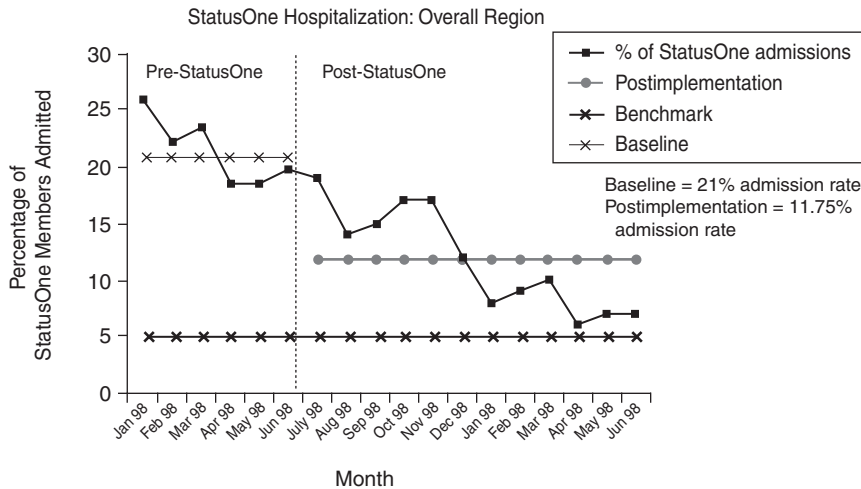
Figure 4. Functional Status Aggregate Measure of the High-Risk Population



illustrating the breadth of clinical and social challenges and the positive impact of care planning can be found in the Appendix.

Mean functional status of the high-risk population rose by 12.5%, from 2.00 to 2.25 through the second quarter of 1999 (Figure 4). The mean acuity rating of the high-risk population dropped (ie, improved) 34% from 1.69 to 2.68 through the second quarter of 1999 (Figure 2).

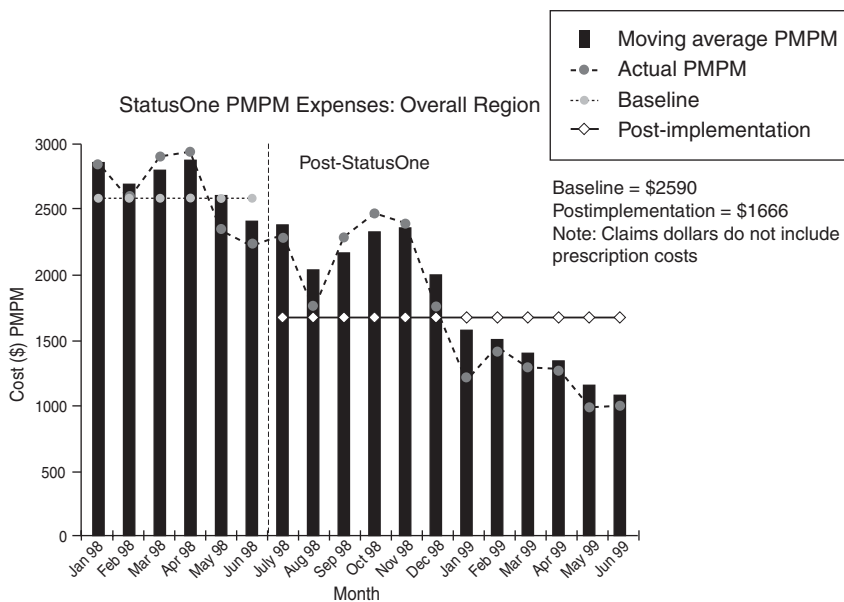
Figure 5. Admission Rate Among the High-Risk Population



Meanwhile the StatusOne monthly admission rate dropped by 43.8%, from 21.0% at baseline to 11.75% by the end of second quarter 1999 (Figure 5). The PMPM expenses of the high-risk population dropped 35.7% from a base-line of \$2590 to \$1666 over the same time frame (Figure 6).

The impact on overall hospitalization was evident. Comparison of the year after program implementation (July 1998 through June 1999) with the year before implementation (July 1997 through June 1998) shows annualized commercial admissions down by 5.3%; Medicare risk admissions dropped 3.0% (Table 3). Length of stay was virtually unchanged; therefore, the number of hospital days per 1000 patients was reduced through the downward trend in admission rates.

Figure 6. Per-Member per-Month (PMPM) Medical Expenses of the High-Risk Population Before and During the Institution of High-Risk Population Health Management



... DISCUSSION ...

Current approaches to medical management often fail to demonstrate economic value across an entire managed care membership. This is not surprising because medical management generally does not systematically target the care of the relatively small number of members who consume a disproportionate share of medical resources.

Utilization management often involves barriers to care that have been demonized in the lay press and political arenas.^{14,15} Efforts such as diversion of inpatient admissions to subacute care were not an integral part of this program. Disease management efforts, such as those for diabetes mellitus,¹⁶ are clinically sound but diffused across larger numbers of people whose economic benefit may be years in the future and accrue to other MCOs.¹⁷ For other diseases, such as asthma or congestive heart failure,¹⁸ benefits can be shown in selected patients but may not translate to the organization's financial bottom line. Carveouts can optimize care for particular conditions,¹⁹ but do not address the challenge posed by comorbidities. Functional status and health risk appraisal screening have produced promising tools²⁰; however, the logistics of regularly updating and repeating the screening process across the whole population and disseminating clinically actionable results can be daunting and inefficient.

Population stratification from existing sources²¹ offers speed in accessing data of the sort used in the HMP program and low cost in processing these data. Recent literature suggests that this method can be at least as accurate as self-reported questionnaires²² without the burden of a very complicated manual process and nonrespondent limitations.

Specialized group clinical settings for chronically ill elderly patients also have demonstrated significant improvements in quality of life and satisfaction, as well as cost savings,²³ but these settings involve radical changes in care delivery and rebuilding of physicians' offices. Some observers have recently called for integrative approaches to care for the chronically ill, especially among the elderly.²⁴

The HMP intervention was designed to address the particular characteristics of its most clinically unstable members, a group that is relatively small. A wide diversity of chief diagnoses—routinely complicated by comorbidities and, most importantly, by subclinical psychosocial complexities—all contribute to the risk of future high-cost medical care. No single disease management initiative could be expected to change the functional status and associated utilization of this group as a whole. Disease states are sufficiently established such that cure is not an option.

The goal of care is for the patient to live better in the face of complex clinical issues. The intervention was designed to maintain and improve the health of this patient group in their communities and, where possible, in their homes.

Placing the population health management system, including the care plans, on a secured Intranet site bypasses the need for internal systems development or modification. It frees care managers to connect from anywhere there is secured access to the Internet across the continuum of care. It also enables novel communication opportunities, including secured access to each patient's medical and social history and care plans, primary care physician/care manager communications, and on-demand feedback relative to financial and clinical outcomes. Important to the future is that this system has established a foundation for direct patient participation and a ready infrastructure to extend interactive care planning to larger disease groupings and the entire membership.

Alternate explanations for the concomitant increase in functional status and decrease in costly inpatient admissions include seasonality, confounding interventions, and chance. We expressed outcomes as comparisons with year-earlier quarters. The outcome year was compared with the full prior year, which served as a baseline. Both approaches controlled for a seasonal effect. Congestive heart failure and hospitalist initiatives were being discussed, but were not effectively deployed, during the time period. Chance is unlikely to be operating over many months with hundreds of high-risk members.

Outcome metrics used in this program are serial, cross-sectional prevalences derived from the current membership each month. These metrics comprise a precise subset of membership, whose measures are directly linked to overall managed care financial experience. A drawback is that these metrics do not follow groups of high-risk patients through time, as would a cohort analysis. Longitudinal epidemiology, natural history, and resource consumption of high-risk populations are fertile areas for further study.

We have not yet obtained measures of customer and provider satisfaction for high-risk population health management. We have reason to believe those results will show improvement from the usual care, because this approach involves direct and proactive contact with patients.

Determining the most effective strategies and tactics of population-based health management will make a promising subject for health services research. However, we have been impressed with the rapidity and extent of financial results.

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Appendix: Examples of At-Risk Members, Their Care Plans, and Likely Impact of These Plans

CASE A—*Functional status at entry: 1. Acuity at entry: 1.*

Situation: A 71-year-old diabetic man with vascular disease was identified as high risk by computer algorithm. His internist had prescribed antibiotics in the weeks before assessment for minor knots and a sore on the stump of a prior amputation. The patient had ignored his physician's invitation for follow-up if the situation did not resolve promptly. There was a history of missed appointments and not taking prescription medications. The patient lived with his wife.

At assessment the care manager found the patient bedridden at home, in pain, with a septic stump and feeling depressed and withdrawn. Although living with his wife and with supportive children in the neighborhood, he was refusing to see them.

Goals: To feel well enough to go walking outdoors regularly. To coordinate medical care for obtaining and using medications and pursuing clinical visits.

Plans: Actions included outpatient incision and draining of abscess, alternate antibiotic therapy, and a renewed clinical care plan developed by the primary care physician and a specialist. Capitalizing on the patient's desire to feel well enough to go fishing, the case manager was able to assist with proper dosing of prescription medications and solve transportation issues with the patient's active involvement.

Impact: Avoidance of the need for hospitalization.

CASE B—*Functional status at entry: 1. Acuity at entry: 1.*

Situation: A 47-year-old woman was identified as high risk by computer algorithm. Clinical constellation included juvenile-onset diabetes for 30 years, clotting disorder of the lower extremities, asthma, prior left leg amputation at the knee, stress incontinence, depression, and social isolation. There were financial concerns with obtaining prescription medications. The patient lived alone and had wheelchair mobility.

Assessment revealed that incontinence was contributing to poor hygiene and prior urinary tract infections, as well as reinforcing further isolation from community and friends.

Goal: To remain in control of her life despite limiting conditions.

Progress: The patient began associating with other patients who had longstanding type I diabetes in a medical center support group. She had bladder suspension surgery for incontinence with marked improvement. Medication and clinical follow-up issues were addressed. She became mentally brighter, felt heard by her providers, and was linked to a community of similarly challenged people.

Impact: Avoidance of the need for emergency admissions and inpatient care.

CASE C—*Functional status at entry: 1. Acuity at entry: 2.*

Situation: A 68-year-old woman was identified as high risk by computer algorithm. Diagnoses included chronic obstructive pulmonary disease with acute exacerbations and panic attacks. She also had low back pain and prior lumbar disc surgery on 3 occasions; left ventricular cardiac dysfunction and mild mitral insufficiency; a history of diverticulitis and polypectomy; and hepatomegaly with fatty infiltrate. A friend provided transportation to medical appointments and obtained groceries. She lived alone in an apartment building.

Goals: To improve coordination of medical care, to reestablish links to the community and a higher purpose by resuming church attendance on Sundays, and to increase daily activity and fitness.

Plan: Actions included use of incentive spirometry, learning breathing and relaxation techniques, learning proper use of inhalers, gradually increasing indoor ambulation, establishing advance directives, instituting home care, and encouraging resumption of outside activity.

Progress: The patient reported a growing interest in taking an educational class to stimulate her mind and to get out of the house. The care manager discovered the need for more effective use of inhalers. The patient began breathing better and driving her own automobile again.

Impact: Avoidance of the need for hospitalizations and emergency room use.