Population Health Management: American Healthways’ PopWorks

PopWorks, an innovative population health management system, promises to produce solutions that will not only strengthen patient-physician relationships, but also significantly impact overall health care expenditures.

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Population health management is rapidly developing into one of the key areas of focus for payers, employers, and providers helping to manage and moderate increases in health care costs. Population health management is focused on improving the health and, therefore, reducing the health care expenditures for the portion of the population that is driving the majority of the health care cost.

The early years of disease management focused on one, or just a few, core chronic conditions, such as diabetes, congestive heart failure or chronic obstructive pulmonary disease. In recent years, the focus has become broader and now includes a much wider set of chronic diseases and other conditions that drive a significant amount of the cost in our health care system.

True population health management goes beyond traditional utilization and disease management; it seeks to better manage the care and health of both chronically ill patients and those patients who are at high risk but have not had an acute event. This new model of care leverages innovative technology and resources to strengthen the patient-physician relationship to have sufficient penetration and impact to significantly bend the trend of health care cost inflation for the entire population.

Population health management uses a variety of proactive interventions, many of which also are used in typical disease management programs — for example, personal nurse care managers assigned to high-risk patients such as those with diabetes and/or cardiac disease. These nurses and health care professionals, working with the patient’s physician, tailor treatment programs for the various clinical conditions – e.g., blood sugar testing, retinal eye exams, weight and diet management, smoking cessation, daily weight checks, and usage of aspirin or beta blockers – to help reduce the occurrence of acute episodes of care caused by these diseases.

Information from the Agency for Healthcare Research and Quality as well as other studies have documented that the Pareto principle is alive and well in health care. Approximately 20 percent of the U.S. population accounts for roughly 80 percent of direct health care spending. Two conditions alone, diabetes and heart disease, account for about $300 billion in annual direct health costs.

Many studies have shown that preventive medicine applied to the broader population does not demonstrate overall savings. And while many programs are valuable and necessary and have a significant impact on improving care, quality of life, and longevity, program costs often are equal to or greater than the overall health costs saved.

However, if the focus of preventive medicine and evidence-based care is applied to the high-cost patients — such as the chronic disease population and higher risk but currently healthy population — significant savings and a very strong return on investment (ROI) can be achieved.

In population health management programs where the right methodologies and tools are used, care improves as the gaps in care are closed, and several results are typically observed.

- Physician office visits increase;
- Pharmacy usage and compliance increase;
- Hospital inpatient admissions and length of stay decrease dramatically;
- Hospital emergency room visits decrease dramatically; and
- Overall health care expenditures are significantly reduced.

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To better understand the impact of effective tools and methodologies on population health management, we will focus on a Microsoft .NET platform known as PopulationWorks, or PopWorks, now in its fourth generation.

PopWorks was developed by American Healthways, the leading and largest provider of disease management and total population care enhancement services in the United States. PopWorks has been a key factor in the company's significant success with the integration of its total population health management approach among and between payers and providers.

American Healthways currently partners with its health plan customers to manage the health of more than 1 million members with chronic disease and other high-cost conditions. American Healthways' customers include for-profit and not-for-profit Blue Cross and Blue Shield plans, national and regional health plans, and health plans' large, self-insured employer customers.

American Healthways' programs are designed to coordinate and integrate a patient's care to achieve a more successful health outcome. Using sophisticated technology and a team of highly skilled, empathetic health care professionals, American Healthways works closely with patients, physicians, health plans, and hospitals to encourage adherence to evidence-based standards of care proven to generate significant improvements in health and, ultimately, reduce health care costs.

American Healthways' programs focus on both chronic diseases and “impact” conditions that drive a large portion of health expenditures (typically 45 percent in a commercial population). Programs for chronic conditions include diabetes, cardiac (congestive heart failure and coronary artery disease) and respiratory (chronic obstructive pulmonary disease and asthma). Programs also are being developed and implemented for cancer and end-stage renal disease (ESRD). Impact conditions include osteoarthritis, acid-related disorders, low back pain, osteoporosis, fibromyalgia, atrial fibrillation/anticoagulant therapy, chronic hepatitis and cirrhosis, incontinence management, irritable bowel syndrome, pressure ulcers, and inflammatory bowel disease. Impact conditions are the next tier of medical conditions that share the following characteristics:

- High cost;
- Relatively high prevalence on a population basis;
- Well-established standards of care; and
- Can be managed to create both clinical improvement and cost savings.

The clinical and financial outcomes realized as a result of the total population health management approach are based on the belief that the fundamental interaction in health care is the one between patients and physicians and that everything else exists to enhance and support that relationship. This belief is the cornerstone of American Healthways' programs, all of which offer enrollees and their physicians multiple points and ways of interacting.

Health plans that have partnered with American Healthways have been able to achieve strong savings and ROI in the first year of the programs. We will explore a short case study of first-year outcomes at Blue Cross and Blue Shield of Minnesota (BCBSM) later in this paper.

**PopWorks**

PopWorks is a proprietary, user-friendly health management system integrated with clinical information, predictive modeling, and telephonic technology that was developed by American Healthways to support and enhance its clinicians' interactions with patients and providers. The PopWorks technology allows the clinician to provide real-time interaction with members to help them manage their disease with their providers. The clinicians are able to work with members to educate them about their conditions, jointly develop care management plans, and empower them to take a more active role in their own treatment.

PopWorks is a scalable information system that prioritizes member needs and facilitates problem-specific assessments and interventions, inpatient management, educational materials fulfillment, and scheduling of future care calls to members. The heart of the PopWorks system is the stratification map that provides a visual representation of a member’s overall health and contains access points to all functional areas of the system. Triggers and stored procedures throughout the system continually act upon new data points and conditions that would cause the member's stratification level to change based on predefined criteria.

PopWorks is the first fully integrated interface built on the practice of evidence-based medicine (EBM). EBM is defined as the use of best evidence in making decisions about the care of individuals. To implement EBM, three components must exist:

**Evidence** - The clinical reasoning and logic or best-known practices;

**Astute clinician** - A clinical expert with the savvy and experience to evaluate data and synthesize the evidence; and

**Patient attributes** - Personal information about the individual such as problems, medications, symptoms, gender, age, weight, family history, past medical history, habits, social factors, education level, and comorbidities.

The PopWorks system is combined with an advanced telephony system that permits automatic dialing and skills-based routing of calls. The system automatically presents the member's chart to the nurse care manager at the start of a care call. If the call is inbound from the member's home phone, the number is recognized by the system and the member's chart will pop up on the screen of the nurse care manager taking the call.
PopWorks can collect and analyze over 5,000 data points on each member, identifying and stratifying eligible members according to acuity. It is an information management system that has the capability to:

- Receive claims, utilization, lab, pharmacy, and eligibility data from participating health plans;
- Cleanse the data to remove duplications, inconsistencies, and gaps;
- Standardize the format of the data;
- Identify the patients who have the conditions that the respective health plan has engaged American Healthways to manage;
- Integrate the data into patient-specific clinical files - “clinical information system”;
- Stratify the patients according to rules-based predictive models;
- Automatically present the data to nurses who are interacting telephonically with patients;
- Document patient-reported medical history, social situations, clinical regimens and practices, self-care goals, physician information, etc.;
- Import biometric data from home monitors into the clinical information system;
- Provide clinicians with evidence-based assessments and corresponding intervention steps and talking points specific to the patient's needs and care plan;
- Provide patients with a, evidence-based health risk appraisal complete with a medications module to detect contraindications and redundancies;
- Provide physicians with Web-based access to patient-specific information contained in our clinical information system (also has the capability to receive input from the physician);
- Provide health plans with Web-based access to patient-specific and aggregate population data;
- Provide utilization and outcomes reports to health plan customers; and
- Compile data in a data warehouse to enable benchmarking, large-scale analyses, data mining, and research to support continuous quality improvement (see Figure 1).

This system currently stores more than 1.2 billion claims rows of total health plan data and accommodates daily, weekly, and monthly data exchanges with its stakeholders. Information contained in the associated data warehouse is multiple terabytes of data, and is one of the largest integrated nongovernment repositories of health information in existence.

**Patient, Payer, and Provider Collaboration**
Influencing patient and physician behavior while simultaneously maintaining their support for the program is fundamental to success. To this end, American Healthways interacts with patients, physicians, and payers in a number of ways:

- In-depth interviews with the health plan to understand the network, benefits, and the ways in which members access services.
- Integration and collaboration with case management services.
- Tools that allow health plans to look at patient risk information related to health care cost and physician best-practice information.
- A dedicated toll-free number for members, providers, and clients.
- A dedicated liaison to provide day-to-day management of the implementation process from the health plan's perspective.
- Senior-level work groups made up of representatives from both organizations provide strategic oversight, performance management, and operational guidance for the programs to ensure their success.
- Annual independent third-party polling of health plan member and physicians to determine satisfaction with and support for the programs.

![Figure 1: Population Health Management American Healthways PopWorks™](image-url)
The use of continually updated clinical practices and strong academic support is also necessary since, in the end, the clinical interventions must improve outcomes.

will visit many of a health plan's largest physician groups (including specialist groups) prior to the start of a program to help educate physicians about the program and to alleviate concerns they might have.

- Primary care physicians and specialists in a health plan's network receive introductory letters and welcome packet information prior to the start of the program, emphasizing that the program is designed to support the physician-patient relationship.
- Establishment of a provider advisory council (PAC). A PAC is typically chaired by a health plan's chief medical officer and is comprised of respected physicians within a health plan's network. A PAC usually meets quarterly to review the activities and outcomes of the disease management program and offers suggestions for improving the program.
- Physicians are regularly engaged by care managers on specific patient-care issues. Physicians receive quarterly physician profile reports that look at the experience of their patients compared to that of their peer groups.
- Access to eResident, a Web-based tool for physicians to allow them to view member clinical information stored in American Healthways' Clinical Information System. The physician can review information such as current medications, diagnosis, lab test values, adherence to standards/guidelines for care, and care manager interactions.
- Disease-specific Web sites grouped by audience (physician or member) containing static information describing the program and allows members and providers to view sample materials.
- CareSteps – CareSteps.com is a secured Web-based interactive site that allows a member to complete an interactive and intelligent health assessment and receive personalized health information based on proven medical standards. Questions presented to the member are based both on the demographic profile of the member (such as sex and age) and the responses to previous questions. Once the member completes the assessment, CareSteps provides health information organized in three different ways:
  - **Personalized health assessment** – contains information about conditions the member indicated he/she has, standards of care related to those conditions, and lifestyle recommendations.
  - **Questions for your physician** – personalized list of questions the member may want to ask her physician. This section is designed to be printed and taken to the physician's office during a visit.
  - **Health comparison** – how the member's standards of care compares to others in the database. Health plans can use the results to identify high-risk members or opportunity areas to devise intervention plans.

Clinicians conduct telephonic general health assessments with all program members on initiation to the program and then annually. Information gained from that assessment includes health status, risk factors, self-management skills and readiness to change, barriers to appropriate care, and gaps to current care. Clinicians also conduct depression screenings, disease-specific assessments, and quality of life surveys.

**Case Study: Blue Cross of Minnesota**

Two years ago, BCBSM faced issues common among health plans. Its disease management programs had resulted in reasonable successes in controlling costs for diabetes and cardiovascular disease. But overall health costs were continuing to increase and employers were asking for explanations as well as methods to help stem the rise.

As the largest health plan in the state, covering 2.5 million members in Minnesota and nationally, BCBSM was no
stranger to innovation, and it was in this context that a meeting between the leaders of BCBSMN and American Healthways proved to be a milestone for the two organizations.

The objectives were clear: Improve clinical outcomes and compliance with care standards, lower total health care cost, and achieve member and provider satisfaction. Population health management programs are part of the arriving generation of disease management. Over the past decade, health plans have worked hard to identify methods to better manage the health of their patients.

In December 2001, the two companies signed a 10-year agreement for a population health management program called BluePrint for Health Care Support.

Beyond Disease Management
Population health management programs are more holistic, looking at the total profile of individuals, who are often at risk of developing multiple medical conditions (e.g., diabetics developing heart disease, stroke, or renal disease). These programs are more complex than typical disease management programs and cut across clinical specialties.

Population health management goes far beyond the typical four to six clinical conditions managed by typical disease management programs. In the case of BCBSMN, 17 chronic diseases or conditions were addressed.

What sets population health management apart then from typical disease management is the integration of three key elements: a far broader scope of chronic conditions and diseases, the application of “one-stop shopping,” in which patients with multiple conditions are managed through a single point of contact and coordination, and the rigorous application of predictive modeling across multiple clinical conditions. The use of continually updated clinical practices and strong academic support is also necessary since, in the end, the clinical interventions must improve outcomes.

In March 2002, BCBSMN launched its population health management program. A team of 120 nurses supported the program. They had an average of 15 years’ experience and diverse clinical backgrounds. They shared relationship building, empathy, and behavior change skills. And through American Healthways, they received continuing clinical and technical training and advice.

Engagement Model
BCBSMN identified members eligible for the program based on claims and pharmacy data, and referrals from members, physicians, and case managers. BCBSMN used an engagement model, in which members were automatically enrolled in the program unless they decided to opt out (versus an opt-in model in which members must enroll themselves). Engagement models typically have a 95 percent participation rate; BCBSMN’s BluePrint for Health Care Support program had 97 percent participation.

BCBSMN classified the initially selected 17 conditions or diseases into one of two groups.

The first group included what BCBSMN termed “core conditions,” that included diabetes, coronary artery disease, congestive heart failure, chronic obstructive pulmonary disease, asthma, and ESRD. The second group included “impact conditions,” which were new to the program and included osteoarthritis, acid-related stomach disorders, low back pain, osteoporosis, fibromyalgia, atrial fibrillation/anticoagulant therapy, chronic hepatitis and cirrhosis, incontinence, irritable bowel syndrome,
pressure ulcers, and inflammatory bowel disease. BCBSMN was the first and only payer in the country to address many of these impact conditions with disease management techniques.

These conditions affect 12 to 15 percent of BCBSMN’s commercial population and account for between 40 and 45 percent of all claims costs. Typical approaches to disease management programs, in contrast, reach less than 3 percent of the population (see Figures 2 and 3).

Program Impact
A common criticism of disease management programs of any kind has been a perceived inability to demonstrate genuine differences in outcomes and cost. Critics have said that savings could have occurred due to other changes, such as the introduction of new drugs or overall changes in physician practice behavior. The introduction of BluePrint for Health Care Support provided BCBSMN with an excellent opportunity to accurately measure the effect of the innovative new program.

Because a health plan cannot simply apply a new program to a self-funded client, such a client must pay for the cost of the program since it will gain all the benefits of lowered health care costs. This difference in clients allowed BCBSMN to measure differences in two cohorts of otherwise similar individuals (i.e., they had similar distribution of age, diseases, and clinical conditions).

The first cohort was made up of fully insured groups (with a small number of self-insured groups that joined early); the second was made up of groups that were not enrolled in the new program, but continued with the typical disease and medical management programs that they had been using. Groups in both cohorts were continuously enrolled for two years, and there were approximately 60,000 individuals in each cohort.

The first-year results show dramatic improvements in health outcomes, resulting in average claims savings estimated at nearly $500 for each member when compared to members in the control cohort. In 12 months, BCBSMN has experienced reduced hospital admissions, reduced emergency room visits, a 2 to 3 percent projected reduction in its fully insured, commercial health care expenditure.

BCBSMN also saw an overall ROI of at least $2.90 for every dollar spent. Based on the results from the first year of operation, the potential future effect is considerable and could easily grow higher (see Figure 4).

Improved Health
Clinical utilization, cost, and satisfaction outcomes from the first year of the program were statistically significant when compared to the control cohort, and include:

- Significant improvement in diabetics’ hemoglobin A1c levels;
- A 14 percent decrease in the overall rate of hospital admissions; and
- An 18 percent reduction in emergency room visits.

Savings

- Average savings in excess of $36 million, or $41 per program member per month, or about $500 per year;
- A return of at least $2.90 for every dollar invested;
- A projected 2 to 3 percent reduction in total fully insured, commercial health care expenditure rate; and
- Indirect savings - more than 7 percent of chronic members and 11 percent of impact condition members report decreased days absent from work or school as a result of the program.

![Graph](https://example.com/graph.png)
Member Satisfaction

BCBSMN surveyed enrollees and physicians annually regarding their satisfaction with the program. Findings include:

- More than 95 percent of eligible members are participating in the program;
- Ninety percent of core disease members and 74 percent of impact condition members were very satisfied or somewhat satisfied with the program, according to an independent survey of members enrolled for at least six months;
- Eighty-four percent of core disease members and 64 percent of impact condition members report they had more control of their health; and
- Fifty-seven percent say the program helps them communicate better with their doctor.

Since Blueprint for Health Care Support was initiated, BCBSMN’s biggest challenge has been in meeting the needs of the administrative-services-only market. These accounts have unique and distinct needs compared to fully insured business. They often want the services specifically branded and customized to their needs. Frequently, outcomes reports need to be tailored to the employers’ specific experience versus aggregate outcomes data for all of the plan’s participating members. Some employers have multiple health plans for their employees as well as multiple data sources for claims.

BCBSMN also points to its selection of an experienced partner as a critical success factor. American Healthways had extensive experience in disease management and was ready to stretch to a new model of comprehensive population health management. Both Blue Cross and American Healthways were driven by the joint vision they had developed to change the way people with chronic disease experienced the system and the outcomes they achieved.

Summary

Population health management, especially when combined with broad and capable information technology systems such as PopWorks, begins to allow all of the elements across the health care medical management value chain (case management, care management, disease management, utilization management, etc.) to come together in one system to produce the kinds of efficiencies and integrated care solutions that drive improved health outcomes on a scale capable of significantly and positively impacting overall health care spending trends.

This is a particularly promising approach when considered as a part of Medicare reform. Under the Medicare Prescription Drug Improvement and Modernization Act of 2003, the Voluntary Chronic Care Improvement Program calls for Phase I disease management beginning December 2004. While Phase I will follow a more traditional disease management approach, it will reach an estimated 1.3 million members and is estimated to expand to cover as many as 14 million members in Phase II of the program. Phase II of the program has yet to be defined, but if and when traditional disease management approaches find success in the Medicare fee-for-service population, one would expect that the government market will gravitate to the same total population health management approach that has become successful in the commercial markets.

The PopWorks platform is an example of a system that is designed to expand, collaborate, and integrate information across the health care continuum and that can support the delivery of population health management at a scale commensurate with the requirements for the commercial population. The PopWorks integration of information to and from patients, physicians, and payers could also serve as a uniquely designed and positioned platform capable of meeting the multifaceted demands of a government-sponsored health care program.

References

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