

Population health management program development: The path to the Triple Aim

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Introduction

Population health and population health management are widely used terms with limited consensus on their definitions. Here we define a population health management program (PHMP) as “a program designed to realize the Institute for Healthcare Improvement’s Triple Aim goals of improved health of populations, improved patient experience, and reduced per capita costs through care delivery innovation.” These innovations may include, but are not limited to, increased coordination of care by clinical experts, improved access to appropriate care, additional healthcare education, increased access to relevant medical history, specialized care for patients with severe or complex conditions, and support for patients with nonmedical barriers to good healthcare.

Both payers and providers targeting Triple Aim goals are looking to shift away from fee-for-service care and toward risk-based contracting. In fact, the U.S. Department of Health and Human Services (HHS) has led this charge by establishing a goal of providing 50% of Medicare FFS payments through alternative payment models by 2018. A revolutionary step towards reaching this goal was realized with the passage of the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA). MACRA creates meaningful incentives for providers to adopt alternative payment models that tie a significant portion of reimbursement to quality and value. As such, it will become increasingly important for health systems and their providers to fully understand the risk-based contracts and how to successfully operate under them.

For a health system to meet the Triple Aim goals, it may require a complete or partial redesign of how it delivers healthcare. Redesign care delivery...What a daunting task. With multiple departments and medical professionals, thousands of services, and often hundreds of thousands of patients to be cared for, redesigning an entire health system feels, and likely is, an untenable task. Imagine a CEO of a hospital system participating in the Medicare Shared Savings Program (MSSP) who is frustrated with not seeing savings; the administrator cannot possibly hope to redesign the entire system to improve outcomes, reduce costs, and help the bottom line within a reasonable time frame. Rather than give up, we propose a systematic approach to the development of PHMPs.

In this paper, we outline a process to design effective PHMPs that will help hospital systems develop a step-by-step approach to care redesign that can improve the health of a population, improve the patient experience, and reduce costs.

While the focus of this paper is not risk-based contracting, risk-based contracts are driving the development of PHMPs. Risk-based contracts often give providers both the financial flexibility and incentive to redesign care. To that end, we highlight risk-based contracting as the driver of much recent innovation and contract-related considerations that organizations must address when developing a PHMP.

Step 1: Assess population costs, utilization, and risk

Understanding the population served by a system is of the utmost importance in making an organized shift toward targeting the Triple Aim. Developing a PHMP isn’t entirely dissimilar to designing a new shoe. Just like shoes are designed for people with different sized feet and for different activities, PHMPs fit best, and don’t cause problems, when they are designed around the specific needs of a population and strengths of a particular organization. With that in mind, the first step in developing a PHMP is to understand the population served and how the healthcare system serves them.

While there are many different ways of characterizing a given population and a number of different features that could end up informing the best direction for a PHMP, critical items to consider are a population’s:

- Demographics
- Healthcare service utilization and cost experience
- Clinical risk profile

The demographic makeup of a population can have a significant impact on medical service utilization, both in the overall level of medical treatment sought and the types of conditions treated. Imagine two hospital systems. System A serves households that are 90% young families, while System B serves households that are 90% retirees. These two systems largely serve drastically different populations, and therefore it is likely that each system should design its care practices

differently. For example, home health may more likely benefit System B than System A, while primary care availability outside of business hours may more likely benefit System A. We emphasize this because additional data analysis is required to understand how each population utilizes services. In addition to age and family composition, it is valuable to understand other demographic features of a population such as gender, geography, occupation, income, social structure, education level, and literacy.

After identifying the demographic features of a population, the health system should conduct a thorough review of its claim experience. Understanding the population claim levels, loss ratios, episode costs, and utilization levels across service types and sites helps inform where people are using services and where the major costs lie. Typical utilization metrics of interest include, but are not limited to, hospital admissions per 1,000 covered members, average length of stay, inpatient facility costs per member per month (PMPM), and outpatient facility costs PMPM, in particular emergency room visits, professional costs PMPM, prescription drug prescriptions per member, primary care office visits per member, and specialist office visits per member. (Note that the term “member” is used to denote a person included in the target population.) This information can be compared with benchmarks or averages adjusted to reflect a similar population. This allows a health system to understand how its population utilizes healthcare services differently from a similar population and where it may have the greatest opportunity to make improvements that will help achieve Triple Aim goals.

Additionally, it is critical to evaluate the clinical risk of a population, i.e., the population’s clinical characteristics affecting healthcare service utilization. Use historical diagnosis codes assigned, diagnosis-related groups (DRG) billed, service types utilized, disease registries, and other data sources and types to assess the risk of individuals in the population. Risk adjustment models can utilize this data to quantify the expected financial risk of a population given its clinical conditions.

Assessing cost and utilization patterns by disease state also helps to frame a picture of how a population utilizes the health system and to identify key drivers of cost. Segmentation of claim experience by clinical condition can also help identify key healthcare system components needed to serve the population.

Step 2: Identify opportunities

The goal of this step is to answer the question, where is the Triple Aim currently being missed? Again using the shoe design analogy, this step focuses on identifying ways that current shoes might be falling short of ideal for your needs (are the shoes a little tight, not durable enough for your activities, slightly lacking in arch support, etc.) so that you can be sure

to address those issues with the next pair. Identify where the population’s health can be improved, patients’ experience enhanced, and/or care provided more cost effectively.

One of the primary goals of the Triple Aim of healthcare is improving the health status realized from the care given—care leading to improved health outcomes and fewer complications for the patients served. While identifying areas where health could and should be improved would be ideal for defining opportunities for PHMP intervention, assessing health status by disease state or by healthcare service presents data challenges.

Collection of data that is needed to cleanly define, track, and summarize service-specific outcomes is not consistent. Therefore, system measurement is limited by the data elements consistently captured.

Measures of system performance must be specific to subsets of the population; for example, evaluating how well the system manages patients presenting in the emergency room with myocardial infarction requires different metrics and assessment tools from evaluating how well the system manages a segment of patients managing diabetes. Therefore, it requires a multitude of measures to sufficiently assess a health system’s performance in providing care that leads to improved health outcomes. Additionally, these measurements are largely non-standardized so it is difficult to compare the results with appropriate benchmarks.

Given these issues, it is difficult, and in some cases impossible, to identify the areas of care delivery that prevent achieving the Triple Aim goal of improved health. However, we expect that more consistent data collection and more standardized performance metric development and analysis will make measurement of a population’s “health” more robust in the years to come.

Identifying the drivers of poor patient experience provides similar challenges. While Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) data exists for many patients who receive inpatient care, it does not provide a complete picture of the patient experience for everyone served by a hospital system. Establishing even a representative sample of patient experience would require a well-planned, widely supported effort to acquire a significant amount of data that does not typically exist today. Because the Triple Aim is emphasizing patient experience, this new focus will likely lead to innovative ways of tracking and using patient experience data in the future.

Reduced per capita costs is by itself one of the Triple Aim goals. Additionally, while measuring cost-effectiveness also provides many challenges, we believe that it is a fruitful approach to finding opportunities to improve care, even though many feel that it is inappropriate or even unethical to use money as the yardstick with which to measure healthcare performance. As statistician George Box said, “Essentially, all models are wrong, but some are useful.” While healthcare

claim data do not even come close to fully capturing the nuances of different care patterns and outcomes, for the following reasons we believe that claim-based healthcare costs are tremendously useful in finding opportunities to improve care delivery:

- Costs may provide a proxy for intensity of care, volume of care, comorbidities, and complications
- A population's complete claim data is often available, particularly when operating in a full risk-based environment
- For a provider organization with risk sharing, it is critical to identify the root causes driving healthcare costs that are higher than expected and/or necessary
- Claim costs are a consistent metric that can be compared across procedures, disease states, and populations

We illustrate with the example in Figure 1, where we compare segments of the population with disparate health issues. The comparison segments have different medical needs and would each require a distinct definition of "successful health outcomes." No patient experience data has been collected.

Claim and enrollment data typically include the information required to develop the illustrative table in Figure 1. In this example, Hospital System A should likely explore opportunities to improve its care for patients with diabetes.

While claim costs certainly don't paint the entire picture of healthcare, they do provide a good basis for analysis, which can be supplemented with additional outcomes and service analysis, once selecting a population segment with the potential for improvement.

Appropriate benchmarks help organizations to understand how their performances compare with others. Not only is risk adjustment critical to identifying opportunities, it also helps gain stakeholder buy-in by accounting for population factors that could affect performance results and benchmarks. In cost analysis, risk adjustment can be used to assign a risk score to each member of a population and estimate the individual's expected cost of care given that person's demographic and condition profile. These expected costs can then be compared with actual member costs. When there is a significant

difference between actual and expected costs for a population, there may be significant opportunities for care improvement.

It is important to note that the difference between expected and actual costs at an individual level is not likely representative of the system as a whole. The following section addresses population segmentation.

Segmentation

The population segmentation process looks for groups of individuals with significant differences between expected and actual costs, using a process that ensures that the differences are not caused by random individual variations. To continue with the shoe design analogy, if the population assessment step in PHMP development is understanding what you need from a shoe, and the identification of opportunities step is identifying where current shoes are falling short in meeting those needs, then the segmentation step identifies groups of individuals who are hindered by the same issues.

While improving the standard of care for an entire population sounds enticing, PHMPs require focused efforts in order to remain cost-effective while producing real improvement in healthcare delivery. Segmentation allows an organization to identify cohorts of similar patients that would benefit the most from a PHMP.

At this stage of the process, there is an understanding of the makeup of the population, its cost and utilization patterns, its clinical risk profile, who has worse results than expected, and which could be improved from a health outcomes, quality, or cost perspective. Segmentation aims to identify subpopulations, or cohorts, with similar characteristics (e.g., condition prevalence, risk levels, claim patterns) and needs (e.g., chronic condition support, more access to primary care, major surgery).

Some typical ways to segment populations include stratifying by cost levels, condition groups, utilization types, and nonclinical determinants of health such as socioeconomic or geographic groupings. As mentioned in the previous section, comparing risk-adjusted actual to expected results is particularly useful in the segmentation process. After calculating the expected-to-actual metric for each member, advanced analytics can help identify segments of individuals who would likely benefit from

FIGURE 1: COMPARISONS OF POPULATION SEGMENTS

COMPARISON SEGMENT	SYSTEM A	BENCHMARK	COST OVER BENCHMARK (\$)	COST OVER BENCHMARK (%)
ANNUAL COST OF CARE FOR PATIENTS WITH DIABETES	\$20,000	\$15,000	\$5,000	33%
ANNUAL COST OF CARE FOR A CHILD WITH ASTHMA	\$6,000	\$6,000	EVEN	0%
COST OF SERVICES INCLUDED IN A TOTAL KNEE REPLACEMENT BUNDLE	\$30,000	\$40,000	(\$10,000)	-25%

improvements in care delivery. Examples of population segments identified by hospital systems as having great opportunities for improvement in healthcare delivery include:

- Medicare and Medicaid dual eligibles over age 65 with disabilities that interfere with activities of daily living
- Patients with behavioral health needs who live in rural areas with limited behavioral health clinicians
- High-risk patients with at least one inpatient admission
- Individuals with multiple emergency room visits

We note that risk-based contracting may influence the segmentation process. For instance, if a health system is under contract to receive bundled payments for the delivery of joint replacement care, it is likely important to investigate this cohort. The segmentation work could look at this subpopulation with the goal of developing a PHMP that targets improved efficiency of providing joint replacements. Alternatively, if the analytic work completed in the previous steps of the process suggests that the health system provides better-than-average value for joint replacement, then it would behoove the health system to explore entering risk-based bundled payments for joint replacement episodes.

Segmentation is a very involved process that should be uniquely applied to a specific population. A full discussion of the segmentation process and strategy is beyond the scope of this article. However, additional consideration may be found in the Milliman white paper, “Developing a population health management program: Considerations for population segmentation.”¹

Step 4: Intervention development

Once a health system has a strong understanding of its risk-based contracting position and has completed the population identification and segmentation processes, it is time to “design the shoe.” The more each shoe is customized, the better the end result. The same is true of a population health management program. Once a population segment is identified, a cross-functional team can begin work designing a program around the needs of that cohort, the strengths of the health system, and the resources available for program development. The team must have decision makers who can ensure the PHMP will successfully achieve the goals of the Triple Aim. In addition, the team must have a clinical champion(s). Clinical expertise will facilitate the redesign of how care is delivered and represent the practicing clinicians when establishing new processes and procedures. Additional team members ensure that the various components of the program can be implemented, e.g., information technology (IT), operations, and

legal, that they will be cost-effective, and that they appropriately consider the realities of the systems’ payer contracts, e.g., finance, analytics, and actuarial.

At this stage of PHMP development, the details of the program are sketched out and refined. This step is often enhanced with additional analytics to help identify specific elements of care delivery that will result in meeting the desired goals. In conjunction with the analytics, clinicians should be assessing a sample of patients and current processes to understand in greater detail how the cohort currently receives care. As an example, if the cohort selected is male patients between the ages of 45 and 60 with type 2 diabetes, what specifically is causing them to be an outlier compared with the benchmark? Are they relying solely on medication to manage their diabetes and failing to regularly see their care providers for additional support and management? Are there higher-than-average cost levels associated with acute complications that are driving expensive and avoidable inpatient care? While developing a PHMP that focuses on the spectrum of care for diabetes might be helpful in meeting improvement goals, a program could be more impactful and cost-effective if it focuses specifically on what is driving the results in the chosen cohort. Armed with a detailed understanding of the cohort of interest, clinical experts can design cost-effective goal-oriented care delivery practices.

Risk-based contracting allows providers to be creative in intervention development and the way they care for patients. It allows them to design a delivery system that rewards keeping people healthy rather than seeking more healthcare services.

The details of risk-based contracts in place will also inform the structure of a PHMP program. What is the reimbursement structure under a given contract? What triggers the start of an episode and what variables drive reimbursement? If cost levels for current care are at or above the level of reimbursement allowed for in a contract, how can a PHMP be structured to improve efficiency and manage costs to levels that provide savings? If quality measures are dictated in a contract, how can the program drive improved quality scores? If reimbursements are risk-adjusted, how can a program look to reinforce the importance of coding efforts? All of these questions and many more are critical in the development of a PHMP that finds the “sweet spot” of improving the overall health of the patient and putting the risk takers on the right side of the contracts they have in place.

The Centers for Medicare and Medicaid Services (CMS) Center for Medicare and Medicaid Innovation Health Care Innovation Awards provide great examples of the efforts toward care innovation and intervention development occurring in the U.S. health system. CMS provided \$1 billion in grants, awarded to fund innovative programs aimed at delivering better health, improved care, and lower costs of care. Organizations

1 Paulus, J. & Creten, N. (May 6, 2016). Developing a Population Health Management Program: Considerations for Population Segmentation. Milliman White Paper. Retrieved July 15, 2016, from <http://www.milliman.com/insight/2016/Developing-a-population-health-management-program-Considerations-for-population-segmentation/>.

receiving Round 1 grants have many different areas of focus for innovative PHMPs, falling into the following categories:

- Behavioral health and substance abuse
- Complex/high-risk patient targeting
- Community resource planning and prevention
- Disease-specific interventions
- Hospital-setting interventions
- Primary care redesign programs
- Shared decision making
- Medication management

These categories will likely be similar to organizations designing PHMPs for other purposes.

One additional challenge organizations face in developing interventions is selecting the appropriate level of specificity for the segment of individuals that will be supported by the program. They must strike a balance between creating programs specific enough to efficiently produce meaningful results and broad enough to impact a significant portion of the total population.

Step 5: Monitor, assess, and improve

While a good deal of preparation is required to develop a successful population health management program and develop a perfect fitting shoe, ensuring an ongoing perfect fit requires continual monitoring, feedback, and adjustments; it is an iterative process. A new program will rarely be perfect at launch, and the ability to assess the program and quickly adapt the interventions will greatly enhance program efficacy.

Program assessment requires the ability to define success, and acquire and analyze program data to measure success. As such, prior to the launch of a program, entities should establish the methods and technical requirements necessary to acquire data that will allow for the analysis of PHMP success. Are costs decreasing? Are utilization patterns improving? Are outcomes more favorable? Is health improving?

Additionally, entities developing a PHMP should, in advance of program implementation, develop mechanisms to adjust and improve the program based on ongoing measurement results. The process will not only improve the current PHMP, but it will also serve to improve future programs.

One critical component of program assessment is calculating a return on investment (ROI). This can be a very difficult process. Program effectiveness could depend upon factors that aren't easily quantifiable or attributed to the program, such as certain clinical outcomes or patient satisfaction. Even more straightforward cost measures can be difficult to assess when trying to determine

savings related to avoided services, accounting for anomalies driven by outliers, or the general trend of healthcare costs over time. Many actuarial techniques exist to address these challenges, which makes actuarial involvement in ROI calculation so important.

While these calculations can be challenging, it is critical to complete them in order to effectively run a health system. Not all PHMP interventions will save more money than they cost to implement, and some may not reduce healthcare costs at all. A PHMP could have a negative financial result and still be considered successful as the improved health or patient experience could outweigh the negative financial impact. If this is the case, health system leaders need to be aware of the added cost and must ensure the financial viability of the organization as a whole.

Conclusion

Population health management programs are becoming more commonplace as the U.S. healthcare industry pushes its focus toward the Triple Aim.

A successful PHMP begins with a careful analysis of the population served, informed decision making surrounding the targeted population, and desired goals of the program. Successful programs are deliberate in not only their planning and identification processes, but also in implementing interventions and analyzing results in comparison with the stated goals. They also closely monitor the program and remain flexible to adapt the program as necessary to achieve their stated goals.

Each of these steps is no easy task. However, with the proper care and rigor put into developing, monitoring, and managing a PHMP, organizations can achieve the Triple Aim of improved health, enhanced patient experience, and reduction in overall costs.

Once a health system develops a PHMP shoe that “fits,” those efforts can be leveraged to design new interventions for additional segments as the system evolves toward that seemingly daunting task of redesigning how they deliver healthcare along with the rest of the healthcare industry.

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