Institute for Health Technology Transformation

Population Health Management

A Roadmap for Provider-Based Automation in a New Era of Healthcare

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Dear Colleagues,

Population health management has been around for a while, but only recently has it gained serious attention from mainstream healthcare organizations. The reason is simple: healthcare reimbursement is changing, and hospitals, healthcare systems, and physician groups must adapt to a new world in which providers are rewarded for meeting quality objectives for their entire patient panel, and not just those actively seeking healthcare. The emphasis clearly is shifting from volume to value, and organizations that focus on providing patient-centered, quality healthcare across a population will come out ahead.

This guide represents the first comprehensive effort to define a roadmap for providers that are exploring population health management (PHM). The literature on patient-centered medical homes and accountable care organizations traverses some of the same fundamentals, but no other study or report has yet provided practical guidance on how to set up the infrastructure that uses the latest health IT applications to facilitate and automate PHM.

This report follows the arc of the principles and best practices of population management:

- The definition of population health management
- Planning for population health
- Data collection, storage, and management
- Population monitoring and stratification
- Patient engagement
- Team-based interventions
- Outcomes measurement

This guide was a collaborative effort of healthcare, payer, association, and software vendor executives who are experts in various aspects of population health management. I would like to thank everyone who contributed to the final product, including The Institute For Health Technology Transformation (iHT2), who helped coordinate and produce this project, ultimately pulling it all together.

The leaders who participated in this project include:

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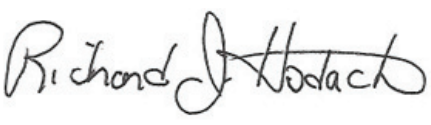
Our hope is that this report will unveil the potential of population health management to transform healthcare and how each step of the way can be smoothed with accessible and practical automation applications. We welcome your comments and stories of your experiences.

Respectfully,



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A Roadmap for Provider-Based Automation in a New Era of Healthcare

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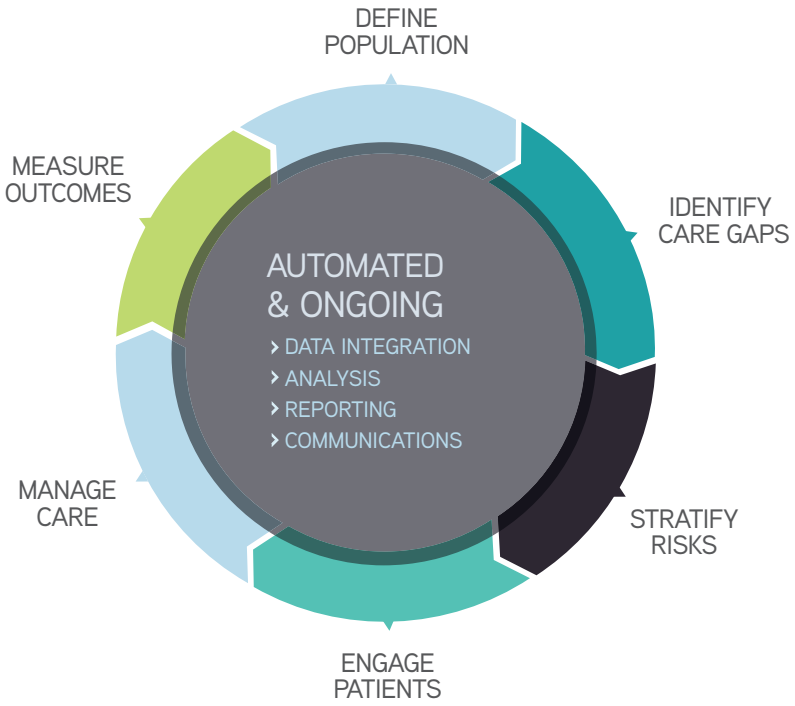
Automation makes population health management feasible, scalable and sustainable.



Introduction

The unsustainable growth of health costs, the growing lack of access to healthcare, and increasing disparities in care have forced the U.S. to start changing how healthcare is delivered. The first major step in this direction was the HITECH Act, part of the American Recovery and Reinvestment Act of 2009. This legislation authorizes up to $19 billion in federal subsidies to doctors and hospitals for the Meaningful Use of electronic health records.[1] Second, the Patient Protection and Affordable Care Act of 2010 includes provisions that encourage providers to begin taking responsibility for the cost and quality of care. These sections of the law authorize demonstration projects to measure the value of patient-centered medical homes and payment bundling.[2] The health reform law also instructs the Centers for Medicare and Medicaid Services (CMS) to create a shared-savings program for accountable care organizations (ACOs), which are groups of hospitals and doctors committed to reducing the cost and improving the quality of care.[3] This program, which began Jan. 1, 2012, will be followed by new Medicare initiatives that will penalize hospitals for avoidable readmissions and base a portion of their reimbursement on quality measures.[4]

Population health management will become a required **core competency** for provider organizations in a post-fee-for-service payment environment.

This whirl of activity at the federal level—paralleled by private insurers' efforts to support medical homes and ACOs—has motivated many provider organizations to start preparing for the reimbursement changes that loom ahead.[5] The overarching purpose of these changes is to move away from fee-for-service, which is regarded as a major driver of the nation's health costs. The reimbursement system that will replace fee-for-service is still taking shape; but it will clearly involve increased financial and clinical accountability. To cope with these new demands, healthcare systems and physician groups are moving toward an approach known as "population health management."

The goal of population health management (PHM) is to keep a patient population as healthy as possible, minimizing the need for expensive interventions such as emergency department visits, hospitalizations, imaging tests, and procedures.[6] This not only lowers costs, but also redefines healthcare as an activity that encompasses far more than sick care. While PHM focuses partly on the high-risk patients who generate the majority of health costs, it systematically addresses the preventive and chronic care needs of every patient. Because the distribution of health risks changes over time, the objective is to modify the factors that make people sick or exacerbate their illnesses.

While PHM focuses partly on the high-risk patients who generate the majority of health costs, it **systematically addresses the preventive and chronic care needs** of every patient.

Such an approach requires the use of automation. Not only are there not enough providers and care managers to manage every patient continuously, but PHM also involves a large number of routine tasks that do not have to be performed by human beings. Bringing modern information technology to bear on these tasks saves time, money, and makes PHM economically feasible. Automation also allows organizations to better assess population needs and stratify populations based on geography, health status, resource utilization, and demographics.[7]

This paper defines PHM, explains how to build a PHM strategy, and shows how automation tools can be used to manage a patient population. Finally, we explain how to measure outcomes and use analytics to improve performance.

Population Health Management: What It Is and Isn't

Population health has been defined as "the health outcomes of a group of individuals, including the distribution of such outcomes within the group." Medical care is only one of many factors that affect those outcomes. Other factors include "public health interventions, aspects of the social environment (income, education, employment, social support, and culture) and of the physical environment (urban design, clean air and water), genetics, and individual behavior."[8]

No single healthcare organization is capable of addressing all of these factors. Nevertheless, providers that seek to do PHM must help manage personal health behavior in a systematic way. And they should work with community resources such as public health agencies, social service agencies, schools and other local organizations to improve the overall health of their populations. This kind of collaboration is still in an emerging stage; but there have been some efforts to combine healthcare with social services to improve population health.[9-10]

At the provider level, the Care Continuum Alliance, an industry group, has proposed the following definition of population health improvement:

> *The population health improvement model highlights three components: the central care delivery and leadership roles of the primary care physician; the critical importance of patient activation, involvement and personal responsibility; and the patient focus and capacity expansion of care coordination provided through wellness, disease and chronic care management programs.*[11]

To accomplish all of this, a provider organization must supply proactive preventive and chronic care to all of a provider's patients, both during and between encounters with the healthcare system. This requires providers to maintain regular contact with patients and support their efforts to manage their own health. At the same time, care managers must manage high-risk patients to prevent them from becoming unhealthier and developing complications. The use of evidence-based protocols to diagnose and treat patients in a consistent, cost-effective manner is also part of the provider-based PHM approach.

The federal Agency for Healthcare Research and Quality (AHRQ) has developed a concept called "practice-based population health" (PBPH). It defines PBPH as "an approach to care that uses information on a group of patients within a primary care practice or group of practices to improve the care and clinical outcomes of patients within that practice."[12] Other observers also define the population as a provider's patient panel.[13]

Population health management is fundamental to the transformation of healthcare delivery. For every provider, this means knowing what's going on with all your patients and **taking action automatically** to proactively achieve the best outcomes.

Planning for Population Health Management

Population Health Management will require a significant change in the way of thinking and the practice patterns of providers. Instead of doing more to earn more, providers will be rewarded for efficiency and quality. They will have to become accustomed to thinking in terms of caring for an entire population and not just for the individual patients who actively seek care. Hospitals will see some of their revenues shift to ambulatory care as admissions and procedures decrease, but will have the opportunity to share in savings as part of healthcare systems and ACOs. And, while providers will continue to compete with one other, they will also have to work together to coordinate care and exchange health information in a culture of shared responsibility.

These changes pose significant and potentially daunting challenges. Not only will healthcare organizations have to embrace a new reimbursement model to support PHM, but they must also encourage their providers to adopt a new way of doing business, including how they are compensated to align with the new reimbursement models. Internal politics and competition with outside provider groups can also challenge collaboration, so leaders will need to anticipate how they will create the right culture and environment for change. Further, healthcare systems will have to open lines of communication with public health agencies and other entities within their communities.

At an operational level organizations must change their structure as well as workflows to implement PHM and adopt new types of automation tools and reporting. This will require setting clear goals, the active participation of leadership — including physician leaders, an assessment of technology requirements, and an effective rollout strategy.

Health information technology is absolutely "necessary but not sufficient" for creating practice-based population health management; committed executive and clinical leadership, care team development, and care coordination processes are also critical success factors.

Setting Goals and Objectives

Besides the goals already stated, it is helpful to keep in mind the Triple Aim of the Institute for Healthcare Improvement: improve the experience of care, improve the health of populations, and lower the per-capita cost of care.[15] While population health is only one of these aims, achieving that objective would help organizations attain the other two. The Triple Aim is also a well-known and worthy goal to rally around.

The adoption of health IT is essential to PHM, but the new model cannot succeed without workflow redesign and change management. According to a paper on patient-centered medical homes, "HIT in itself will not drive changes in practice or outcomes. HIT without workflow, process, and relationship change will not work. HIT provides foundational support to enable the workflow and process changes that ultimately will foster stronger relationships and healthcare experiences."[16]

Among the key characteristics of health organizations that implement PHM are an organized system of care; the use of multidisciplinary care teams; coordination across care settings; enhanced access to primary care; centralized resource planning; continuous care, both in and outside of office visits; patient self-management education; a focus on health behavior and lifestyle changes; and the use of health information technology for data access and reporting for communication among providers and between providers and patients.[17]

Cutting-edge technology-based applications for actionable, multi-level reporting, patient engagement and education, and quality improvement will be needed to **continuously identify and impact thousands of patients efficiently.**

Showing Leadership

Healthcare leaders must take firm control of the transition to PHM. The areas in which leadership is especially important are information technology adoption and implementation, change management, performance assessment, and coalition building.

Change management includes educating providers and other staff members about the need for PHM. Many physicians do not understand why the old ways of practicing medicine are no longer adequate. Including clinicians in the leadership of a PHM initiative is an excellent way to overcome this resistance.

Healthcare leaders must also build coalitions with other healthcare providers and community organizations. One of the most immediate goals of such collaborations is to create health information exchanges (HIEs) to ensure that all of the relevant patient data is available to providers at the point of care.

Technology Assessment

The selection and implementation of health IT is among the most important components of planning for PHM. Electronic Health Record adoption is only the first step toward creating the requisite infrastructure. A wide range of other applications will be required to automate PHM properly and to engage patients in their own care. Moreover, systems must be constantly re-evaluated because of rapid changes in technology, as well as new government regulations. So providers should work closely with their vendors to make sure they get timely upgrades that can help them meet the latest requirements.

Healthcare executives are increasingly looking beyond the vendors who supply their core financial and clinical information systems. While some of these companies are beginning to move into the realm of PHM, more specialized vendors are developing the cutting-edge applications that will be needed for the success of PHM initiatives, such as actionable, multi-level reporting, patient engagement and education, and quality improvement.

Rollout Strategy

Any program as ambitious and far reaching as PHM must be introduced incrementally. For example, primary care practices might want to start with automated patient outreach programs, or hospitals might want to supplement their call centers with automated features that help improve post-discharge care transitions. Whatever is done should be tested on a small scale before being rolled out to the entire organization.

Ideas in Practice

Our EHR database is the most valuable database we have, and I can slice and dice the data in many ways for reporting purposes. But the EHR lacks some important features for population health management. Among them is the ability to send messages to patients who need preventive and chronic care.

To do this essential outreach, Bon Secours uses a service that maintains a registry of our patient population. By applying clinical protocols to the registry data, this service generates automated messages to patients who need to be seen. Last year, the system made 78,000 telephone calls; as a result, patients scheduled 17,000 appointments with their providers. Our organization doesn't have the manpower to do that kind of outreach manually.

In the future, we'd like to be able to predict which patients are most likely to get sick and incur major treatment costs. Risk stratification and predictive modeling tools designed for healthcare providers are now available, and we're investigating them. Once we can identify the subpopulations that are most at risk, we can devise proactive strategies to fill their care gaps.

Robert Fortini
Vice President and Chief Clinical Officer
Bon Secours Medical Group
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Data Collective, Storage and Management

Efficient, systematic data collection, storage and management drive automation, quality measurement, and performance analysis; and, comprehensive, timely, relevant information is essential to high-quality patient care. But current EHRs are not designed for PHM or for interoperability with other systems.[18] To fill these gaps in information technology, organizations need registries, other supplemental applications, and health information exchanges. In addition, the registries must be population-wide databases, not limited to patients with specific diseases.[19]

The first challenge is to gather patient-centered data from multiple sources. Healthcare enterprises may have the ability to aggregate information from their own systems in a data warehouse, and individual practices may have EHRs with interfaces to their main reference labs. The information in these systems can be used in building registries for tracking and monitoring population health. Even billing and scheduling data can enable physician groups to create registries that can improve preventive and chronic care—although these registries lack key data such as whether a patient has his or her diabetes or hypertension under control.

EHRs often do not contain much information about the care that patients have received outside a provider organization. Community health information exchanges are expected to solve this problem, at least in part, when they become widespread.[20] Providers who want to engage in PHM should strongly support efforts to build HIEs, which can facilitate the sharing of information about a patient's health problems, medications, lab results, and procedures, regardless of site, payer or tracking system.

Data management for PHM purposes is also challenging because each provider and health plan has a different system for patient identification and provider attribution. Community HIEs should use master identification numbers for patients and providers. EHRs and other healthcare applications should include fields for linking data across data sets and matching patients to their primary care providers.

The level of data accuracy and completeness will continue to expand, and it will be necessary to use clinical information alongside billing data for some time to come, as providers and caregivers standardize data collection.[21] Unstructured data in scanned documents and dictated notes will continue to be part of the clinical record in EHRs. But in order to build effective registries, produce meaningful reports, and measure quality accurately, providers must improve data integrity, increase the amount of discrete data, and use standardized measures.

To avoid redundancy, the preparation and collection of data for quality measurement should be designed to meet not only PHM objectives, but also Stage 1 of Meaningful Use requirements.[22] Moreover, organizations should already be looking at how to satisfy the criteria of Stage 2 Meaningful Use, which will guide them further into PHM.[23] They should also consider the quality criteria that the government recently announced for ACOs.[24]

Investing time up front to build integrated and reliable population-wide data systems pays off: timely, accurate, and trusted reports drive effective quality and care management processes and results.

Population Monitoring and Stratification

To manage population health effectively, an organization must be able to track and monitor the health of individual patients. It must also stratify its population into subgroups that require particular services at specified intervals. AHRQ describes one method of segmenting patients:

> *Providers must be able to identify subpopulations of patients who might benefit from additional services. Examples of these groups include: patients needing reminders for preventive care or tests; patients overdue for care or not meeting management goals; patients who have failed to receive followup after being sent reminders; and patients who might benefit from discussion of risk reduction.*[25]

From a care management viewpoint, patients should be stratified by their risk of getting sick or sicker. Grouping patients into categories by condition has been the traditional approach of disease management programs. In contrast, care management stratification focuses on whether patients are ill enough to require ongoing support from a care manager, have less serious chronic conditions that warrant interventions to prevent them from worsening, or are fairly healthy and just need preventive care and education.[26] Patients can also be stratified by demographics, health status, behavioral risk, and financial risk.

Risk stratification must be updated frequently. Of the patients who generate the highest costs in a given year, less than 30 percent were in that category a year earlier.[27] So an organization that hopes to improve the quality and lower the cost of care must pay attention to all of its patients and their changing health status.

Health insurers use predictive modeling algorithms that can help forecast which patients are likely to have significant health costs. Some health plans are giving tools provider organizations these kinds of tools,[28] which can be valuable in identifying patients who may be hospitalized or suffer complications in coming months. But, since these programs are not designed for providers and have limited utility in clinical settings, organizations must define and develop more appropriate tools.

AHRQ recommends categories of health IT tools for the stratification and monitoring of populations. Among them are applications that:

- Target patients in greatest need of services by narrowing subpopulations;
- Make data on patients actionable by generating alerts to patients to seek appointments with their providers;
- Make data actionable by generating alerts to providers about patient care needs.[29]

EHRs can generate alerts for preventive and chronic care, but typically prompt providers only when a patient's record is opened, usually during a visit. Real-time prompting is needed to assist providers and support patient empowerment. Moreover, while the ability to produce population health reports is becoming more common, quality and population reporting is not a typical feature of EHRs.

Electronic registries fed by EHR and administrative data are a richer source of actionable data and risk stratification reports. When such registries are coupled with evidence-based clinical protocols based on national standards, specially designed applications can generate messaging to patients to make appointments for needed chronic and preventive care.[30] Moreover, registries can also be used to send reminders to providers and care managers about their patients' care gaps.[31]

Making population registries actionable first requires **stratification** by risk, conditions, or other criteria important to the practice; automated algorithms and report filtering tools allow clinical teams to prioritize, distribute and monitor intervention activity and results continuously.

Patient Engagement

In an organization dedicated to PHM, providers must care for patients between as well as during encounters. Care teams must strive to deliver appropriate, evidence-based care during patient visits, but they must also ensure that care gaps are addressed when patients do not come into the office. That requires motivating and collaborating with patients to help them take care of themselves. Care teams must also find ways to help patients understand their care plans and the importance of complying with recommended guidelines.

The most powerful motivator is the patient-physician relationship itself. When patients have been out of touch with their provider for some time, alerts about the need to see their doctor can engage patients and get them started down the road to better health. By leveraging the patient-physician relationship, providers can encourage patients to change their health behavior, and often produce the desired result.[32]

Effective PHM involves a complex interplay between human interventions and automation tools. For example, hospital call centers can only help patients who call them. But automated messaging to all discharged patients can urge them to see their providers, fill their prescriptions, and call the hospital if they have any questions about their care plan.

Similarly, care managers can handle only a limited number of patients at a given time; but they can prioritize their caseloads if they know which patients have the most urgent needs. In addition, online health risk assessments can help identify patients who require assistance in managing their health. And physicians can prescribe online educational programs to patients to increase their ability to care for themselves.

Studies show that patient engagement can help improve health outcomes and avoid preventable deaths. For example, modifiable behavioral issues, such as smoking and obesity, are responsible for 40 percent of the deaths in the U.S.[33] And when patients get recommended screening tests, they are more likely to be aware of their health issues and do something about them.[34]

Ideas in Practice

To improve population health, we have to be able to look at the health care, the health care needs, and the safety issues of whole populations. And we can't do that without information technology.

Any healthcare organization, for example, has the capacity to connect with patients and invite them to make appointments for needed care. But the time and personnel costs of that are prohibitive in our current healthcare system. The ability to identify care gaps and engage patients in their own care necessitates the use of the electronic technologies. It also requires the use of consumer health components, including personal health records, that many health systems are now offering.

The overall agenda of population health management is to create a seamless communication, a seamless delivery of service, and a seamless engagement of the patient/consumer, whether that is in the home, the community, or in long term care. To meet those goals, it is essential that we utilize mobile health and telehealth technologies. We must also maximize information exchange among the different care providers and other components of our health system.

Connie White Delaney, Ph.D., R.N.,
Dean, School of Nursing,
University of Minnesota

Provider organizations recognize that some patients, for either economic or behavioral reasons, will not respond to outreach and will remain noncompliant. But among those that do respond, a recent study shows, the use of registries with outbound messaging can lead to increased compliance.[35]

Newer technologies also have great promise in PHM. Home telehealth devices, for example, have become more sophisticated and less expensive, and telemonitoring data can be transmitted to care managers more easily than in the past. A report on the Veterans Health Administration's telehealth program shows that the use of this technology has cut hospital admissions by 19% and hospital bed days, by 25%, for the patients involved.[36] There is also evidence that telemonitoring can reduce mortality in patients with chronic diseases.[37]

Interactive web-based applications and tailored educational programs can also be effective, according to an AHRQ paper that reviewed a large number of studies. Over 80 percent of the studies showed that the interventions had a positive effect on at least one clinical outcome.[38] To be effective, however, these programs must be coupled with other interventions to motivate patients to improve their health.

While there is little data yet on how mobile health applications affect patient outcomes, healthcare organizations should watch this space carefully, because the number of mHealth applications is exploding. Recently, it was reported that there are about 17,000 such programs in app stores.[39] Meanwhile, some EHR vendors are beginning to integrate mHealth apps for managing chronic diseases into their products.[40] So this technology clearly provides opportunities for patient engagement.

There is evidence that personal health records can help engage patients and improve their health outcomes. One study, however, notes that current PHRs have serious limitations and that people with chronic conditions are less likely to use them than healthy people are.[41] Moreover, only about 10% of the U.S. population uses PHRs at present. But Kaiser Permanente's success with this medium suggests it may play an important role in PHM in the future.[42]

Patient engagement is no longer limited to the number of phone calls staff can make between appointments—**automated outreach and care manager-driven campaigns and education can scale and tailor interventions** across all patients using phone, email, text, mobile apps and wireless biometric devices.

Practices can also use technology to **collect and integrate patient-reported information** and activities, such as Health Risk Assessments, blood pressure tracking and medication adherence, for more timely risk management and coaching.

Team-Based Interventions

Primary care is at the heart of PHM, because primary care physicians (PCPs) supply the continuity required to ensure that patients receive appropriate preventive and chronic care.[43] But PCPs are in short supply, and they will be stretched even further when healthcare reform increases the number of insured patients and the demand for primary care. Even today, it has been estimated, a PCP would have to work 18 hours a day to deliver all of the care that his or her population needs.[44]

However, other clinicians can perform much of this work, enabling doctors to focus on areas where their expertise is required. Care teams led by physicians, nurse practitioners, or other professionals can manage more patients and address more of their needs than the current primary care model does.[45] These care teams may include mid-level practitioners, nurses, medical assistants, dietitians, physical therapists, care managers, health coaches, and others.

The primary care practice of the future will have a workflow very different from that of today. Instead of being based around one-to-one encounters between patients and providers, workflow will include phone visits, e-mail consultations, group visits, and encounters with a variety of care team members. Out-of-office contacts will become the norm, and there will be fewer office visits.[46]

High-performance care teams will need advanced automation and communication methods to function properly. We have already discussed the value of information systems that can provide up-to-the-minute, comprehensive views of patient care by gathering data from a variety of sources. In addition, population-wide registries can provide alerts and reports that undergird care management, outreach, and "inreach" (the provision of appropriate care during face-to-face encounters).[47]

"High performance" care teams utilize automated reports, alerts and patient communications to minimize manual tasks, reach more patients successfully and devote more clinical and coaching talent to patients who need them most.

Today, many organizations are adding care managers to manage chronically ill patients at home. Without automation; however, this is very costly work. To start with, practices and health systems define the roles of care managers poorly; in most cases, it's unclear which patients they should manage and when those patients should graduate from their care. Moreover, care managers spend roughly 40% of their time searching for patient data, which contribute to their inefficiencies.

Unpublished data from a large Midwestern group indicates that care management requires an average of 138 minutes of staff time per patient. By applying that figure to the prevalence of complex chronic conditions in the typical primary care practice, one can calculate that a single PCP with a panel of 2,500 patients would require 1.35 care managers, and a 10-doctor practice would need 13 care managers.

Much of what these care managers do, however, can be automated. This includes the identification of patients who need their services, the analysis of care gaps, communications among physicians, care managers, and patients, online health risk Automated alerts about needed care and tailored educational materials should be sent to patients who have chronic conditions and are able to engage in their own care. Healthy patients should also receive automated communications — including phone, e-mail or text messages, that encourage preventive care. And after discharge from the hospital, all patients should be automatically contacted to ensure they understand their discharge instructions and to improve transitions of care.

Automation allows care team members to spend less time performing routine tasks and more time interacting with patients who need their assistance. It helps prepare patients better for office visits. And it allows provider organizations to conduct PHM without overburdening their financial and human resources.

Measuring Outcomes

Data analysis is an integral part of PHM. Specially designed business intelligence applications are required to measure mortality, health status, disease prevalence, and patient experience. Reports using this data must be available to providers, care managers, and top management. Organizations must also measure costs and patient experience on a population-wide basis. And they may use these reports as the basis for quality reporting to payers and other outside entities.

To describe population health at any given time, organizations can use a variety of measures, including those that describe processes (how many patients with diabetes received an appropriate HbA1c test?), intermediate outcomes (HbA1c or blood pressure levels), and long-term outcomes. The latter requires a combination of clinical data and patient-reported data, such as functional status and self-perceived health.[48-49]

Provider reports may be based on a combination of clinical data from EHRs and claims information from billing systems; patient self-reports have a different format entirely. An advanced rules engine can integrate these disparate types of data with evidence-based guidelines to generate customized reports and show management how well the healthcare system is serving various segments of its patient population. But the data must be clean, accurate, and thoroughly validated, especially if it is going to be used in reports about provider performance and patient outcomes.

With the help of standardized reports displayed on a dashboard, practice or health system managers can analyze the data over time to identify trends and spot gaps in PHM. In the long run, it will also be important to standardize reporting across provider organizations in order to create regional and national benchmarks.

Analyses of the health status of population segments can show management where their PHM approach needs to be strengthened or modified. A PHM dashboard can also be used for risk stratification, for identifying the prevalence of health conditions by provider or site, and for evaluating provider and practice performance. The entire population can be filtered by payer, activity center, provider, health condition, and care gaps. The same filters can be applied to patients with a particular condition, such as diabetes. But trained clinical analysts need to do this work; it should not be delegated to IT staff or business staff with minimal training.

The ability to do this kind of reporting can also help organizations collect and submit quality data to CMS and private payers. The same data analysis that is used in PHM can be re-used for programs such as CMS' Physician Quality Reporting Initiative, the Medicare and Medicaid EHR incentive programs, health plan pay for performance programs, and patient-centered medical home recognition programs. But to do that efficiently, the performance measures that organizations use in PHM should be aligned with the payer programs' metrics.

Ideas in Practice

Healthcare systems that want to start doing population health management should first take a look at their own data warehouses. By leveraging their existing infrastructures for collecting and analyzing the data, they can lay the foundation for population health management and determine what additional data they will need.

Most of the information in data warehouses comes from hospitals, not ambulatory care clinics or other care settings. Because of the Meaningful Use incentive program; however, healthcare providers are increasingly developing the ability to exchange clinical summaries in the form of Continuity of Care Documents (CCDs).

Many providers with that capability haven't yet set up end-to-end solutions for exchanging data. But the time is coming when CCDs will be routinely traded across organizational boundaries. That won't end the division between inpatient and outpatient databases, but it will reduce the gap significantly. The advent of health information exchanges will further increase the interoperability of systems.

Mobile health, a field that's starting to explode, will also have an impact on population health management. mHealth applications will generate an avalanche of new healthcare data. At present, not much of that is going into EHRs, partly because few apps are integrated with EHRs. But when the field becomes more standardized, mHealth could provide a rich source of data to support patient self-management.

Andy Steele, MD
Director of Informatics
e-Health Services, Denver Health

Population health management requires healthcare providers to develop new skill sets and new infrastructures for delivering care.

Ideas in Practice

At Kaiser Permanente, we put a lot of effort into customizing our EHR as part of the implementation process, which took several years. One reason we did that is that the EHR we had purchased lacked many of the features needed for population health management. For example, we had to develop registries and automation tools to identify care gaps, do patient outreach, and stratify populations into subgroups such as people with chronic illnesses and people at the end of life.

Healthcare organizations that are trying to do population health management must also find a way to integrate their EHR--as Kaiser has--across inpatient, ambulatory care, and continuing care settings. Not only does that improve the coordination of care, but it also provides other opportunities for proactive care management.

For instance, Kaiser has been leveraging its EHR in an approach called the "proactive office encounter." The basic idea is to provide as much appropriate care as possible during office visits: if patients come in for an acute problem, they also receive care for their chronic conditions.

While this approach is not uncommon, we have taken it a step further by leveraging our systems integration. If patients come in for a lab test and it's discovered that they haven't refilled their medications for a chronic condition, the lab will arrange that. And if members are in the pharmacy and it's found they're in need of a mammogram, the pharmacist will ask their physician to order one. That has been a fundamental shift for us, and it has had a dramatic impact on filling those care gaps and improving our performance on quality measures.

Kaiser also regards patient engagement as a crucial part of PHM. Our patient portal allows members to schedule appointments, review medications, see lab results, e-mail doctors with questions, and receive health information materials. Our patients can also view their medical information in a personal health record. All of this involves the patient more in their own care, while allowing families to participate more fully with the patient's permission.

Alide Chase, Senior Vice President, Quality and Service
Matt Stiefel, Senior Director, Care and Service Quality
Kaiser Permanente

Conclusion

Population health management requires healthcare providers to develop new skill sets and new infrastructures for delivering care. Automation is crucial to ensuring that every patient receives appropriate preventive, chronic and transitional care. Automation can also help organizations perform PHM efficiently so that they can make the transition from fee for service to accountable care while while enhancing financial and organizational sustainability.

EHRs and automation tools should be used to support these essential PHM functions:

- Population identification
- Identification of care gaps
- Stratification
- Patient engagement
- Care management
- Outcomes measurement

By applying technology and automation to every aspect of population health management, provider organizations and health systems will be able to deliver quality care to thousands of patients in an efficient and sustainable manner. As a result, the transition from volume to value will be smoother and have a much better chance to yield the results all healthcare providers desire for their patients and their practices.

About the Research

Population health management is fundamental to every major healthcare reform initiative today, and is most visible in the Patient-Centered Medical Home and Accountable Care Organization. Although providers now have the incentive to implement Electronic Health Record (EHR) technology, EHRs alone are not sufficient to manage populations effectively. Provider groups and health systems that automate the spectrum of population health functions will be best positioned to succeed.

The purpose of the Automating Population Health Research Project is to help physicians and care teams understand how innovative use of technology beyond the EHR can make population management achievable. Automating population health management is a crucial step in achieving cost effective, patient-centered care.

This project will help identify the key strategies to appropriately and continuously leverage technology to identify and engage a population, stratify risks, and measure outcomes within a primary care setting.

Working with recognized healthcare leaders and researchers from a range of backgrounds and perspectives, the Automating Population Health Research Project will be focused on identifying practical and effective technology-based strategies medical practices and health systems can apply to the challenges of managing defined populations and not just individuals in an environment moving from volume to value. The group will provide insights and recommendations in a variety of formats for industry consideration.

The Automating Population Health Research Project is comprised of individuals from provider, health system, health information technology, academic, and health policy domains. This diverse group is well-versed in patient-centered care, health information technology and the imperative to transform healthcare delivery and performance in innovative ways.

About Phytel

The premier company empowering provider-led population health improvement, Phytel provides physicians with proven technology to deliver timely, coordinated care to their patients. Phytel's state-of-the-art registry, which now encompasses more than 20 million patients nationwide, uses evidence-based chronic and preventive care protocols to identify and notify patients due for service, while tracking compliance and measuring quality and financial results.

Phytel's suite of services allow care teams to deliver appropriate care efficiently across their entire population, regardless of care setting.

Phytel uniquely combines automated interventions with analytic reports to measure the overall effectiveness of quality improvement programs.

Headquartered in Dallas, TX, Phytel's clients include many of the nation's leading health care organizations. To learn more about Phytel, please visit **phytel.com** or follow us online at **twitter.com/phytel** or **facebook.com/phytel**.

About The Institute for Health Technology Transformation

The Institute for Health Technology Transformation (IHT²) is the leading organization committed to bringing together private and public sector leaders fostering the growth and effective use of technology across the healthcare industry. Through collaborative efforts the Institute provides programs that drive innovation, educate, and provide a critical understanding of how technology applications, solutions and devices can improve the quality, safety and efficiency of healthcare.

The Institute engages multiple stakeholders:

- Hospitals and other healthcare providers
- Clinical groups
- Academic and research institutions
- Healthcare information technology firms
- Healthcare technology investors
- Health plans
- Consumer and patient groups
- Private sector stakeholders
- Public sector stakeholders

Mission & Vision

The mission of the Institute for Health Technology Transformation: to drive improvement and the effective use of technology throughout the continuum of care through education and collaboration among multiple stakeholders. Technology in-and-of itself will not solve the deep challenges facing our healthcare system nor will it alone ensure more accessible and higher quality care. Realizing the benefits of technology across the healthcare continuum is a complex, under utilized and often misunderstood process. Stakeholder collaboration underscores the Institute's focus working to ensure technology has a transformative effect at all levels of the healthcare sector.

What We Do

The Institute for Health Technology Transformation (iHT²) provides programs that drive innovation, educate, and provide a critical understanding of how technology applications, solutions and devices can improve the quality, safety and efficiency of healthcare. We do this though a number of vehicles including: educational workshops, access to industry thought leaders, peer reviewed research, high level conferences, webinars, focus groups, topic specific committees, and other unique initiatives allowing individuals and organizations access to resources that will enable them to leverage the full value of healthcare technology.

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