Executive Summary

Population health management (PHM) has become the focus of patient-centered medical homes, accountable care organizations (ACOs), and healthcare systems that are concerned about impending changes in reimbursement. Because PHM entails continuous care of the entire patient population, it requires health IT solutions that automate routine tasks, facilitate communications, and maximize the effectiveness of care teams. Unlike the current model of care delivery, PHM requires that care be patient-centered, proactive, coordinated, continuous, and comprehensive. This paper explains what population health management is, how it changes care delivery, and how best to use health information technology to support PHM.
Introduction
The chief problems in the U.S. healthcare system are well known. The system historically focused on acute care, although chronic disease care generates more than 75% of health costs. About 16% of our citizens are uninsured; because many of the uninsured don't receive proper medical care, they have high rates of emergency-department visits and hospital admissions. The dominant method of paying healthcare providers is fee for service, a type of reimbursement that incentivizes them to maximize the volume rather than the value of services. And because our system is highly fragmented, good coordination of care is the exception rather than the rule.3

Healthcare reform is a top priority for the U.S.—and not just on the insurance side. The Patient Protection and Affordable Care Act (frequently abbreviated ACA) includes a major focus on transforming healthcare delivery.4 Partly to carry out its mandate under the ACA, the Centers for Medicare and Medicaid Services (CMS) has embarked on a multi-pronged effort to improve the quality and safety of care and reduce its cost. Some of these initiatives, including the Pioneer ACO portion of the Medicare shared savings program and the Medicare bundled payment demonstration project, require providers to share financial responsibility for healthcare with CMS while improving patient outcomes.5 Private payers are also offering risk sharing contracts.6

To prepare for the challenges of healthcare reform, many healthcare organizations are gravitating toward PHM as an approach to keep people as healthy as possible and to prevent patients with chronic diseases from getting sicker.7

The PHM approach requires providers to change aspects of how they deliver care. Instead of focusing only on the care of individual patients, for example, they must also pay attention to the health status of their entire patient population. Instead of just treating patients who seek care, they must also intervene with people who don't seek treatment for their ailments, who are out of compliance with their treatment plans, or who are basically healthy but at risk to become sick in the future.8

Defining PHM and Types of Populations
The PCMH, the ACO, and the National Quality Strategy are designed to help achieve the Triple Aim of the Institute for Healthcare Improvement (IHI), a Boston-based nonprofit organization that is dedicated to improving the quality of healthcare. As described by former IHI and CMS chief Donald Berwick, MD, Thomas W. Nolan, and John Whittington, the Triple Aim consists of:

- Improving the individual experience of care
- Improving the health of populations
- Reducing the per capita cost of care

Berwick, Nolan and Whittington define a population as those who belong to a particular kind of group rather than as the people who live in a geographic area.14 For example, the population could be the people who seek care from a practice or healthcare organization, who have a particular health condition, or who belong to a specific socioeconomic group.

The U.S. Agency for Healthcare Research and Quality (AHRQ) used a similar approach in formulating the concept of “practice-based population health.”15 This term refers to the responsibility of primary care groups and networks for the health of their patient populations. By extension, it could also refer to the primary care-driven multi-specialty groups and independent practice associations (IPAs) that have formed many ACOs. In either case, the population consists of the patients of the physician practice or organization.

Once the population has been defined, PHM requires certain interventions to improve the health of that group of individuals. The Care Continuum Alliance, an industry association, has proposed a definition of “population health improvement” that includes these components:

- The central care delivery and leadership roles of the primary care physician
- The critical importance of patient activation, involvement and personal responsibility
- The patient focus and capacity expansion of care coordination provided through wellness, disease and chronic care management programs16

Evolution of PHM
Insurance companies and self-insured employers are financially responsible for the health of defined populations. So it’s not surprising that both types of payers have deployed some elements of PHM over the years. Among other things, they have:

- Hired disease management firms to monitor and provide extra care for the sickest patients with chronic diseases
- Sponsored wellness programs that encourage health plan members and company employees to exercise, eat right, and take better care of themselves
- Provided health coaching and alerted people to their unmet preventive and chronic needs9-11

Patients’ mistrust of insurers and the low level of physician involvement have limited the effectiveness of these initiatives. So health plans have recently embraced two important vehicles designed to engage physicians and healthcare organizations: the patient-centered medical home (PCMH), with financial incentives to practicing physicians,12 and partnering with healthcare organizations to build accountable care organizations (ACOs).13

In both models, the key objective is to improve population health. The population that providers are addressing is different and often a broader population than that of an insurer or an employer; but in many respects, the means of improving population health are the same. Therefore, provider organizations can learn a lot from payers in this area and vice versa.
The role of IT in effectively managing population health

Fundamentally changing care delivery
PHM fundamentally changes the way that a healthcare organization approaches the delivery of care. Unlike the current model of care delivery, PHM requires that care be patient-centered, proactive, coordinated, continuous, and comprehensive. Moreover, patient engagement is as important as provider interventions in improving population health, because medical care is only one factor—and in many cases, not the most important one—in determining health outcomes. The more engaged patients are in managing their own care and in modifying their health behavior, the more likely they are to remain healthy or improve their health.17

Population Health Management Affects Six Key Care Delivery Areas

- Multidisciplinary care teams
- Care coordination
- Continuous care and communication
- Patient engagement
- Organizational change
- Automation

Here are some of the key areas in which PHM affects care delivery:18

Multidisciplinary care teams
To ensure continuous, comprehensive care, the PHM model requires care teams that include primary care physicians, mid-level practitioners, lower-level clinicians, nurse care managers, health educators, outside specialists, and other health professionals. In community health clinics that treat a lot of Medicaid and uninsured patients, social workers may be involved, as well. Patients and their family caregivers are also members of care teams.

Care coordination
A key goal for both medical homes and ACOs is to improve care coordination across care settings. This involves tracking the services provided to patients and monitoring their health status. In addition, organizations must be able to identify care gaps as they arise and to alert providers and patients about them. Primary care physicians must be able to refer patients easily to specialists and receive reports back from those doctors. Similarly, hospitals must proactively inform patients’ personal physicians when they are admitted and discharged and provide discharge summaries promptly.

Continuous care and communication
Providers must regularly communicate with patients, whether they seek care or not. A variety of interventions can be executed using online or interactive voice communications, allowing care managers to focus on the patients who are the sickest and generate the highest costs. In addition, a personal health record, coupled with online access to providers, helps chronic disease patients manage their own conditions.19

Patient engagement
Modifiable behavioral issues, such as smoking and obesity, cause an estimated 40% of avoidable deaths in the U.S. Moreover, patient noncompliance with physician advice is rampant. Many patients don’t fill prescriptions or take the recommended dose of medications, and 75% of patients don’t keep follow-up appointments.20

A PHM strategy tries to counter these tendencies, partly by maintaining continuous contact with patients. Physicians can persuade patients to modify their health behavior, but may not be effective because of their limited contacts with patients. Nevertheless, the physician influence need not be confined to the exam room. Care teams acting in the doctor’s name can amplify his or her influence through a variety of interventions—some office-based, some automated—that reinforce care plans and build patients’ confidence in their ability to manage their own health.

Organizational change
The PHM model cannot succeed without workflow redesign and change management on a massive scale. That requires large-scale organization. While some small practices have been able to reengineer themselves as patient-centered medical homes, it takes a staggering amount of work on top of the increasing demands of daily practice.21 Big organizations are more likely than small ones to have the level of resources required for PHM, as well as the requisite skill sets in planning, management and information technology.

Automation is key
There is really no cost-effective way to implement PHM without the use of automation. No matter how many care managers a healthcare organization adds, they will be unable to meet the demands of continuously caring for the entire patient population by applying manual methods.22 Just to ensure that various subgroups of diabetic patients follow their treatment regimens, for example, is a herculean task in most practices. And that’s only one health condition. PHM requires what business experts call “mass customization”—the ability to custom-tailor mass-produced goods and services or, in this case, healthcare interventions to large numbers of people.23 Without automation, PHM is an impossible dream.

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PHM Data Management
While a growing number of healthcare organizations understand the need for population health management, relatively few have the data capabilities to execute it successfully. A recent paper about the experience of Premier Health Care Alliance’s Accountable Care Collaborative sums up the situation:

ACOs require an extensive investment in information technology to improve care coordination and prevent duplication of efforts. However, few providers have developed population health data management capabilities, or have used information technology to streamline and improve the clinical and administrative aspects of care. To succeed as ACOs, providers need seamless care coordination with population health status measurement capabilities that will improve health status and reduce overall costs.24

The paper lists these elements of a population health and data management strategy:

- Collect individual health status data
- Stratify and target populations based on their risk and need for care
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- Provide tools to engage people in their health using personal health records or online portals
- Enable connectivity to a health information exchange or integrated platform to ensure portability of records
- Support workflow tools that direct physicians toward appropriate, evidence-based care protocols

Other IT capabilities are required for a successful PHM strategy, including:
- Seamless communications that support team-based interventions
- Ability to coordinate care across all care settings
- Automation of care management
- Patient outcomes measurement
- Measurement of clinical and financial performance

Registries and data sources

A prerequisite for any PHM data strategy is the implementation of electronic health records (EHRs). But, even though a majority of physicians now have some kind of EHR, many do not. So the communications piece of PHM must include the capability to push clinical data to providers who don’t have EHRs.

EHRs enable providers to store and retrieve data, but they lack many of the tools required for implementing and automating PHM. In its report on practice-based population health improvement, AHRQ pointed out that most EHRs cannot generate population-based reports easily; present alerts and reminders in such a way that providers will use them rather than turn them off; capture sufficiently detailed data on preventive care; or interoperate with other clinical information systems. Moreover, while many EHRs contain patient portals, they are not designed to connect individual care alerts with patient outreach.

Consequently, organizations that seek to do PHM must supplement their EHRs with third-party applications of various kinds. The most important kind of enhancement is an electronic, population-wide patient registry. Such a registry lists all patients’ health problems, the healthcare services that have been provided to them, the dates when they were provided, their lab results, and other information.

Among other things, registries and associated analytic software can be used to:
- Stratify populations by health risk
- Identify care gaps
- Alert providers and care managers about unmet patient health needs
- Create patient lists for outreach to patients who need services
- Improve communication among care team members
- Detect “leakage” of patients who receive care outside of an ACO or a health organization’s network
- Generate PHM performance reports

The data required to compile a comprehensive registry extends beyond the information contained in a single organization’s EHR. Ideally, the registry should also encompass data on services that have been rendered to patients outside of the organization and, sometimes, outside of the geographical area in which patients usually receive healthcare.

To obtain some of this data, providers may use a regional or community health information exchange (HIE). But these HIEs don’t exist everywhere; even where they are present, they don’t include all providers; and they don’t cover out-of-area or out-of-state care. So claims data from health plans is an indispensable aid to ACOs and other organizations that manage population health. Fortunately, many payers are willing to provide this kind of data to ACOs under certain arrangements.

Monitoring population health with predictive modeling/risk stratification

The importance of continuously monitoring the health status of the population cannot be overstated. In any given year, less than 30% of the patients with the highest health costs were in that category a year earlier. To manage population health effectively, therefore, it is essential to know which patients are getting sick or have a high likelihood of becoming ill at any point in time. Predictive modeling software can be helpful in identifying these patients.

Analytics can also be used for health risk stratification. In this process, the entire population is classified according to the health risks of individuals and subgroups. For example, an analytic tool could identify the 2-5% of the population who need hands-on attention from care managers, as well as other patients who have less serious chronic conditions and those who are fairly healthy. By filtering subgroups of people who have particular conditions and need certain kinds of care, risk stratification can serve as the basis for tailored interventions.

Health risk assessments (HRAs) are another crucial ingredient in tracking population health. A great deal is known about these instruments because of their longstanding use in corporate America. Many large, self-insured companies ask their employees to fill out HRAs as part of wellness programs. While these questionnaires may be lengthy and time-consuming, financial incentives can increase the percentage of people who fill them out, and placing HRAs online makes it easier for consumers to access them. Healthcare organizations should also use newer data sources such as personal health records and biometric monitoring via home or mobile devices where available.

By using registries, online health risk assessments, and other data, provider organizations can assemble profiles of patients’ health status and update them as new information comes in. An organization can use analytics to generate timely reports on the prevalence of various health conditions in a population, as well as work lists of patients with conditions that the organization decides to prioritize. For example, if an ACO or PCMH is trying to reduce the percentage of diabetic patients who develop complications, it might choose to focus on patients who have not had an eye exam in the past year or who have trouble managing their blood sugar levels (HbA1c >7), or both.
Care management applications

The AHRQ report points out that it is not enough to know which patients and subgroups have care gaps. That data must be made actionable in the workflows of providers and care teams. Some EHRs have the ability to prompt physicians when a patient needs a particular type of preventive or chronic care. But that capability is insufficient for PHM, because providers are alerted only when they open a patient’s electronic chart, which is usually during a visit. Other kinds of applications are required to turn knowledge into action for the entire population.

Among those applications are tools that message patients automatically to alert them about their care gaps, so they will make appointments with their providers. Another type of application sends patients care plans prior to visits to maximize the value of their physician encounters.

Care managers can also use PHM reports to prioritize their work. By staying informed about which patients are the sickest or which are becoming sicker, they can intervene in a timely manner to help those patients. And automation tools linked to registries can be used to target patients who have less serious conditions with individually tailored programs to improve their health.

Health IT is also essential to care coordination, which requires that providers be able to access the latest information about their patients’ health and healthcare. All of those who collaborate on patient care – including primary care doctors, specialists, hospital staff, and long term and post acute care (LTPAC) providers – must have online access to this data from any location. And the information must be as timely and as comprehensive as possible.

This is where HIEs come into play. By pulling together patient data from multiple providers and disparate EHRs, HIEs can supply an indispensable platform for care management and care coordination. While large integrated delivery systems can build such an HIE themselves, most provider organizations and ACOs are incapable of creating this infrastructure on their own. So, while private HIEs are expanding faster than public HIEs today,21 the advent of ACOs and PHM will eventually require community HIEs that cross business boundaries.

Although some community HIEs are quite advanced, an HIE that is truly useful for population health management must go beyond the current model. It must be a communications platform that allows providers to collaborate with each other and with patients. It must also permit many kinds of health professionals to plug in, whether or not they have an EHR. Everyone who touches the patient – whether they’re home health nurses, physical therapists, behavioral health specialists, pharmacists, or doctors – should be able to use this web-based platform to exchange information and coordinate care.

Patient engagement tools

Consumers treat between 80 - 90% of their illness symptoms at home,32 and the most important determinants of health are personal health behavior and environmental factors.33 So medical interventions during patient encounters can be viewed as the tip of a very large iceberg. Unless healthcare organizations can monitor and act on information about patient health outside of office and ER visits, their PHM strategies will not be very successful.

HRAs and registries are useful for keeping tabs on the changing health status of individuals. But both types of applications have a built-in time lag. In the future, new applications and devices will be used to automate health monitoring for large populations on a near-real-time basis.

Today, home remote patient monitoring (RPM) devices are most frequently used to record the vital signs of very sick patients, such as people with congestive heart failure (CHF). Patients with chronic conditions such as hypertension and diabetes may also monitor their own conditions at home. With the advent of mobile technology and advanced wireless communications that connect portable monitoring devices to smartphones, it is now possible for people with chronic diseases to measure their health status anywhere and transmit data to care managers.34

Partly because most providers lack incentives to do non-visit care, and also because of the difficulty of sitting through the data, RPM on a population-wide level is still in an experimental stage. But a recent study by the Geisinger Health Plan showed that the use of RPM reduced hospitalizations of patients with CHF; and Geisinger has expanded its program to include patients with diabetes and hypertension.35 As the evidence of efficacy grows, and as applications to detect patterns in data improve, RPM will become a key component of population health management.

Meanwhile, many other tools to engage patients in their own healthcare are already available. These range from automated health coaching and education to mobile health (mHealth) apps that encourage wellness and fitness. Some of the latter includes aspects of online gaming and social networking.36 Telehealth systems that allow patients to consult with providers at a distance are also starting to spread, and not just in rural areas.37 Telehealth may be a key building block of PHM in the future.

Many providers can already exchange information with patients through patient web portals. Often attached to EHRs, these portals allow patients to request prescription refills and appointments, receive lab results, and consult with their providers online. Some portals also include personal health records that contain a subset of the data in provider EHRs.38

Measuring performance

The ability to measure and report on clinical performance is a core capability of any organization that seeks to manage population health. This requires analytics that can generate reports on the entire population and on particular subpopulations, including patients with certain health conditions. Such an application should also be able to launch reports that break down performance by individual provider, site, and organization.

At a more granular level, PHM mandates the ability to analyze data related to healthcare processes, such as whether a patient with diabetes has received an HbA1c test in the prior six months or a year; intermediate outcomes, such as whether a patient has blood pressure or LDL cholesterol under control; and long-term outcomes, such as functional status and the downstream complications of chronic conditions.39
To collect this data on a population-wide level, provider organizations must build longitudinal patient records that encompass the entire spectrum of care settings, from primary care to hospitalization to post-acute care. And to participate in payer programs that condition value-based payments on meeting quality targets, they must be able to collect and report quality data. Finally, organizations must feed back clinical quality data to physicians in a form that they can use to improve patient care. For example, physicians might receive reports on their diabetes patients that allow them to drill down to individual care gaps and outcomes.

If an organization is at financial risk for healthcare costs, it must be able to track those costs and measure the impact of its PHM approach on expenditures. Consequently, healthcare organizations that engage in PHM need financial as well as clinical performance reports to execute their business strategy.

Financial reporting should keep managers apprised of overall healthcare costs as well as break down costs by provider, site, health condition, and patient subgroups. They must also be able to measure how many patients are going outside the organization for their care, where they're going, and how much that costs.

Finally, both financial and clinical managers need configurable dashboards that will allow them to create their own reports, as needed. They should have access to up-to-date performance data on both quality indicators and resource utilization. This will allow them to make informed decisions about how to redirect resources or which subpopulations need extra assistance to improve their health.

Conclusion
As the healthcare industry moves toward value-based reimbursement and various forms of financial risk, it is evident that PHM will be an invaluable strategy. The time to prepare for PHM is now, and the analytic and automation tools needed to build the necessary infrastructure are available. The biggest challenge facing providers who go down this road will be changing their culture and their orientation from the model of treating one patient at a time to managing the health of their population. Only by ensuring that every person in a population receives care team attention and assistance in self-management can an organization hope to improve quality and reduce costs to the extent required.

Notes
13. Terry, “Why are health insurers buying physician groups?”
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22. Institute for Health Technology Transformation, “Population Health Management.”


27. Terry, “Why Are Health Insurers Buying Physician Groups?”


29. Institute for Health Technology Transformation, “Population Health Management.”


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