DIGITAL REVOLUTION ENABLES POPULATION HEALTH MANAGEMENT
SUMMARY

Regulatory reform, advances in technology and changing demographics are driving major changes in the way healthcare services are offered. In response, healthcare organizations are shifting to new patient-centric care models that make care more collaborative and focused on outcomes. New investments will need to focus on the power of combined information sources, deriving greater context. This is needed to more effectively and securely leverage patient data, recognize patterns faster, and manage the health of populations more effectively. The transformation to population health management will improve health outcomes and reduce the overall cost of care.
Trends driving change in industry also provide the means to improve it

Everyone has a stake in the well-being of the healthcare industry. The Triple Aim of healthcare reform — improving the patient care experience, improving the health of populations and lowering the per capita cost of healthcare — conveys benefits to individuals and society. However, setting a strategy to achieve those goals isn’t straightforward. Key changes in the market, in technology and in regulations are creating new challenges for organizations in all segments of the industry.

Regulatory reform has spawned a great deal of change. In areas such as the adoption of electronic health records (EHR) and compliance standards, organizations are rapidly implementing new systems to hasten the switch to digital record keeping. In the United States, laws such as the Health Information Technology for Economic and Clinical Health (HITECH) Act, part of the American Recovery and Reinvestment Act of 2009, and the Patient Protection and Affordable Care Act, and in the United Kingdom, the Health and Social Care Act of 2012 and the NHS Five Year Forward View 2020 are mandating that institutions revamp patient care models to enhance care coordination and the transition of care, restructure billing to support outcomes-based reimbursement and improve other fundamental functions.

More patients are prepared to participate actively in their care and recovery, and they expect a seamless experience, delivered on their terms.

Defining 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 ER visits, hospitalizations, imaging tests, etc. PHM not only lowers costs, but also redefines healthcare as an activity that encompasses far more than sick care. While population health management focuses partly on the high-risk patients who generate the majority of health costs, the technique systematically addresses the preventive and chronic care needs of every patient.

Such an approach requires the use of automation. Bringing digital information technology to bear on these tasks saves time and money and makes population health management economically feasible. Automation also allows organizations to better assess population needs and stratify populations based on geography, health status, resource utilization and demographics.

Population health management is fundamental to the transformation of healthcare delivery. For providers, the term translates to knowing what’s going on with your patients and taking evidence-based, standardized and, where appropriate, automated actions to proactively achieve the best outcomes.

Keeping up is a challenge

Considering the speed and scope of change, it’s hardly surprising that many organizations are struggling to adapt. Some trends, such as the evolution of patient-centric care, have challenged norms that existed for centuries. Once seen as the sole authorities in matters of treatment and care, doctors and hospitals now share responsibility with patients. Business models that were built on the volume of patients and number of

Approximately 5% of patients account for about 50% of all U.S. healthcare spending.

Source: IDC, Vendor Assessment: Care and Disease Management Solutions Evolve Toward More Analytics, Population Health Approaches, Deanne Kasim, October 2014
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Patients with low engagement levels incur costs from **8-21% more** than patients who are actively engaged in their own health decisions, according to a 2013 study published in Health Affairs.


M architecting treatments are now shifting to payments based on health outcomes.

The industry’s predominant trends are pushing healthcare to transition from a supply-based, acute care system to one that is demand-based, population-centered and digital. This requires providers to find new models of care that empower patients, especially as responsibility for their health outcomes shifts to one of shared accountability.

As patients become active participants in determining the kind of treatment they want, institutions will need to coordinate across the care continuum. Providers and payers alike are putting a lot of effort into integrating new technologies and absorbing the growing volume of data generated by smart devices and wearables. The need for flexible and interoperable computing resources is growing, and the current IT status quo is not suited to that need.

Managing the transition

At an operational level, organizations must change their structure, as well as workflows, to implement population health management and adopt new types of automation tools and reporting. This requires setting clear goals, active participation from leadership, an assessment of technology requirements and an effective rollout strategy.

Key characteristics

The adoption of advanced, standards-based health IT (HIT) is essential to population health management, but a new model cannot succeed without workflow redesign and change management. Among the key characteristics of health organizations implementing PHM are: (1) an organized system of care; (2) the use of multidisciplinary care teams; coordination across care settings; enhanced access to primary care; and centralized resource planning; (3) continuous care; (4) patient self-management education; (5) a focus on health behavior and lifestyle changes;

Putting Data to Better Use

The shift to population health management makes possible more personalized care. Personalized healthcare is more than just using predictive analytics to generate tables and graphs. It requires adding context to large varieties of data and distilling it down to something actionable. Thousands of factors come into play in healthcare, and we need approaches that can tell us what matters and how we can take action. This means, for example, going beyond simply monitoring habits of diet and exercise and forecasting the likely consequences of an action (or inaction): How much weight will I gain? Will I get diabetes?

This kind of care is possible only when there are high-confidence algorithms capable of finding interventions that improve health outcomes. Modern IT platforms make it easier to integrate new data and produce high-confidence predictions from simple algorithms. Simple algorithms can produce amazing results when acting on enriched data.

Google, for example, made a big leap in Web search when it used a simple page-rank algorithm on integrated hyperlink and text data. Modern platforms can use simple analytics on integrated patient records and patient-generated data (wearables, social media, etc.) to make predictions that lead to better clinical decision support, lower rates of readmission, and fewer adverse events.

In healthcare, there is no shortage of data, but the shift to population health management and modern platforms puts that data to better use. Using modern platforms provides an alternative approach to developing ever-more-complicated algorithms. It can lower the cost and increase the pace of innovation in personalized patient care.

— Jerry Overton, Data Scientist, CSC Distinguished Engineer
and (6) the use of HIT for data access and reporting for communication among providers and payers and between providers, payers and patients.3

Technology assessment
The selection and implementation of HIT is among the most important components of planning for population health management. EHR adoption is only the first step toward creating the needed infrastructure. A wide range of other digital applications is 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.

Rollout strategy
A program as ambitious and far-reaching as population health management must be introduced incrementally. For example, primary care practices might want to start with automated patient outreach programs (in the United States, this is now funded by the Centers for Medicare & Medicaid Services), or hospitals might want to supplement their call centers with automated features that help improve care transitions after discharge.

Handling data
Efficient, systematic data collection, data storage and data management drive automation, quality measurement and performance analysis, all essential to high-quality patient care. Current electronic health record systems, however, are not designed for population health management or for full interoperability with other systems.4

To fill these gaps in IT, organizations need registries, supplemental applications and access to disparate data distributed across multiple organizations and, in some cases, health information exchanges (HIEs). In addition, registries must accommodate population-wide databases not limited to information about patients with specific diseases.5 Managing data for PHM purposes is challenging because each provider and payer has a different

Early adopters will begin to consider 3rd Platform EHR replacements in 2016 and will begin replacement implementations in 2017.

Isolated and disconnected data repositories have been, and remain, among the biggest barriers to efficiency gains and improved services in the industry.

Ensure security and privacy
Isolated and disconnected data repositories have been, and remain, among the biggest barriers to efficiency gains and improved services in the industry. Ensuring the security and privacy of data to bridge those gaps is one of the most important elements of the new data environment. Infrastructure that allows collaboration and provides the right level of security for each touchpoint across the network is essential to other elements of population health management, especially in the use of advanced analytics.

Monitoring and stratifying population
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. While grouping patients into categories by condition has been the traditional approach of disease management programs, care management classifies patients by their risk of getting sick or sicker. The 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.⁶

Risk stratification must be updated frequently. Payers use predictive modeling algorithms that can help forecast which patients are likely to have significant health costs. Electronic health records can generate alerts for preventive and chronic care, but they 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. Electronic registries, fed by EHRs, administrative data and other federated data sources, are a superior source of actionable data and risk stratification reports. When such registries are coupled with evidence-based clinical protocols based on national standards, specific messages can be generated, reminding patients to make appointments for needed chronic and preventive care.⁷

Engaging patients
In an organization dedicated to PHM, providers must care for patients between and during encounters. Care teams should deliver appropriate, evidence-based care during doctor visits and ensure that care gaps are addressed when patients do not come into the office. This 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.

Effective PHM involves a complex interplay between human interventions and automation tools. For example, hospital call centers typically help only patients who call them. But by reaching

Virtual care will become routine by 2018, and by 2020, 80% of consumer service interactions will make use of IoT and big data to improve quality, value, and timeliness.

One out of three individuals will have their healthcare records compromised by cyberattacks in 2016.


out, through automated messaging, for example, to all discharged patients, a hospital 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 if they know which patients have the most urgent needs and when those needs must be addressed, they can prioritize their caseloads. 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.

Newer technologies also have great promise in population health management. 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. Interactive Web-based applications and tailored educational programs can also be effective. These programs must, however, 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 mobile health applications and devices is exploding.

Team-based interventions
Primary care is at the heart of population health management. Primary care physicians (PCPs) supply the continuity required to ensure that patients receive appropriate preventive and chronic care. But PCPs are in short supply, and they are being stretched even further as the demand for primary care increases. Other clinicians, however, 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 needs than the current primary care model does. In addition, population-wide registries can provide alerts and reports that underpin care management, outreach and the provision of appropriate care during face-to-face encounters.

Measuring outcomes
Big data and analytics is an integral part of population health management. Specially designed business intelligence applications can measure mortality, health status, disease prevalence and patient experience. Reports using this data can be made available to providers, care managers and top management.

Importance of mHealth Applications Developed by Payers and Providers
On a scale of 1 to 10, with 1 least importance and 10 most important, how important is it that your health plan/provider offers a mobile health application it developed?


One out of three individuals will have their healthcare records compromised by cyberattacks in 2016.
Big data and analytics is an integral part of population health management.

Organizations can 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, intermediate outcomes and long-term outcomes. The latter requires a combination of clinical data and patient-reported data, such as functional status and self-perceived health.

New rules of engagement and healthcare IT paradigms
Continued regulatory pressure, new technologies and patient expectations are pushing providers toward systems and models that provide convenience and improved care for less. Therefore, organizations need to respond to new rules of engagement with new healthcare IT paradigms.

Healthcare without walls
Wearable technologies, the Internet of Things (IoT) and mobile devices are key technology components in the shift to population health management patient-centric health systems. Devices that report a growing number of physiological statistics are enabling patients to monitor their status, reducing the need for visits. But the expansion of these devices, inside and outside the organization, is creating the need for a net-centric enterprise.

Institutions should begin to migrate toward modern network architectures that are inherently more secure and flexible than the previous generation. Unlike the hub-and-spoke design that uses fixed hardware components, modern networks are built from virtualized computing and network devices on software-defined infrastructure and networks. This allows the network to be managed in a far more automated way, with the ability to automatically scale up or down to meet demand changes and to ensure quality of service and experience.

Ecosystem of services
Providers now need to be able to assemble healthcare services from multiple organizations. One of the first steps in this direction is the creation of a patient care coordination center (CCC). The CCC can determine the best entry point for a patient to receive the most appropriate and cost-effective care. Central to the success of this center is the HIT system that supports it. A care-coordination system must present a patient’s data to clinicians across the local health and social system.

The knowledge-driven enterprise
The key to improving population health management is building a deep understanding of patterns of health, disease and well-being. The power of data comes from analytics, and many providers need to liberate the large amounts of data already residing in enterprise systems, such as electronic health records. EHR patient data is of enormous value to individual patients and physicians, but the potential value to the healthcare system is much greater.

Organizations need to identify and understand innovative uses of data that will help them reduce costs and identify

The combined annual growth rate in the analytics market from 2010 to 2020 will be in the 8–11% range; this places analytics among the top areas of spending growth for hospitals and health systems.

Following years of investment in advanced EHR applications and related technologies, healthcare organizations now have the potential to capitalize on these assets and accelerate key business and clinical transformations. With aggregation, standardization and analysis, data can offer the insights healthcare providers need to close gaps, improve care and make distinctions in patient populations that can help stratify services, deliver care more efficiently and provide more appropriate, higher-quality care in a wider range of settings.

**Integrated IT infrastructure and applications**

IT infrastructure is essential to creating a clinically integrated network to improve population health. Following years of investment in advanced EHR applications and related technologies, healthcare organizations now have the potential to capitalize on these assets and accelerate key business and clinical transformations. A solid IT foundation should leverage agile IT storage, processing, analysis and data management. This infrastructure is essential for healthcare organizations to make better, evidence-based business and clinical decisions and seamlessly secure resources on demand. For instance, flexible cloud-based and hybrid architectures are emerging as key accelerators for managing population health. They can greatly increase an organization's flexibility in accessing, maintaining and storing data.

**Conclusion**

Population health management promises to improve health outcomes and reduce the overall cost of care. But the transition requires an investment in new technologies and ways of doing business.

By applying technology and automation to every aspect of healthcare management, provider and payer organizations will be able to deliver quality care to 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 of yielding the results all healthcare providers desire for their patients and their practices.

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1. The IHI Triple Aim - http://www.ihi.org/engage/initiatives/TripleAim/Pages/default.aspx
4. Hodach, “The promise of population health management” (see footnote 3).
8. Hodach, “The promise of population health management” (see footnote 3).
How CSC Can Help

CSC believes that our Agile Health framework, coordinated care solutions and innovative technology platform can bring together major healthcare system stakeholders and create an environment for success.

While taking into account possible constraints in existing organizations and systems, our Agile Health framework brings together all stages of the HIT evolution:

CSC’s eHealth Optimization solutions enable organizations to maximize their financial investments in EHR systems and create greater clinical value through new integration, and open information and API gateways that support interoperability.

CSC’s Population Health Enablement solutions expand the care model and the integration of services to deliver better health and well-being population outcomes by enabling enhanced clinical function and collaboration, and data insights to optimize care and improved patient outcomes.

CSC’s Agile IT approach promotes “as-a-service” enterprise that automates IT operations and ensures consistency of deployed solutions in a continuous delivery model that enables organizations to meet the aggressive cycle time frames.

All of these components are delivered in a heterogeneous healthcare landscape that lets organizations derive value from a flexible IT environment that enables and responds to transformational change. It offers the richness of open clinical collaboration with a built-in situation awareness security framework, which ensures privacy and confidentiality.
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