Population Health Management, Data and Technology

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Calabrese has chaired the Section Advisory Group (SAG) on quality and compliance and is currently a member of the SAG on manager development. Calabrese also serves on the American Society of Health-System Pharmacists (ASHP) council on pharmacy management and has been an ASHP delegate for Ohio. Calabrese is an active faculty member with the ASHP manager's bootcamp and is a past president of the Ohio Society of Health-System Pharmacists. Calabrese is a frequently invited lecturer who has published and presented on various management and leadership topics.

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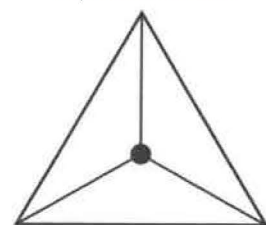
Operational Definitions

Population health is composed of a variety of different meanings depending on the context and approach. It is a field of study and research that is used in an attempt to understand the factors influencing the health of populations.[1] The population can be based on geographic regions, employees, ethnicities or a diagnosis. Medical care systems, the social environment and the physical environment are determinants of health that have their biological impact on individuals in a population. There are two main approaches to population health. There is a role of social, economic, biological and environmental factors that help determine the health of a population. It is also viewed as the goal of making significant improvements in the health of a specific population. The use of data to understand "health outcomes, patterns of health determinants, and policies and interventions that link these two," is impacting population health and can be used to improve health overall.[1] This data is frequently referred to as "Big Data."

While "Big Data" may be new in terms of its use with population health, collecting and analyzing healthcare data has been occurring long before the health system began identifying high-cost disease states and specifically targeting at-risk populations.[2] "Big Data" is defined as large data collections that are examined in order to visualize trends or patterns in the healthcare system. The information is collected in a variety of ways including research, patient records, test results, mobile apps, medical claims, genetic studies and through social media. Patient populations at high-risk of developing chronic disease states can then be identified allowing for more targeted healthcare interventions. Examples of "Big Data" being used are seen as far back as 1944 when Fremont Rider, librarian at Wesleyan University, published The Scholar and the Future of the Research Library. In his work Rider estimated that every 16 years American university libraries were doubling in size, and hypothesized that the Yale Library will have nearly 200 million volumes, requiring over 6,000 people to catalogue it, by the year 2040. With the development of technology, gathering healthcare information has become increasingly simple. The healthcare community is beginning to utilize the technology that has been put into the hands of healthcare providers. They are doing so by pooling the data from individual patients in order to visualize trends that could help determine the best course of evidence-based treatment for certain patient populations. More specifically, the trends found using this healthcare data can be used to identify and better treat the patients at the highest risk of developing, or those who have already developed, high cost disease states.

According to Calabrese, the key to population health management is in the transition from volume-based care to value-based care. Currently, most of our health systems use a payment system where providers charge fee-for-service. This leads to their incentive being volume, or the amount of patients they see and how often they have to see them. As a result of this fee-for-service system, patients are seen more often, and care is targeted toward acute, single episodes and treating current symptoms rather than preventing or treating chronic disease states. The providers must rely on retrospective results which involves seeing how the patients are doing currently and the symptoms and results they have shown in the past. Calabrese, along with the other pharmacists at the Summit, agree that healthcare needs to move toward value-based care that focuses on quality rather than quantity.

A Focus on Population Health Management

Calabrese explained population health is one of the top ten challenges and opportunities for hospitals according to the Becker's Hospital Review in 2015.[3] Calabrese explained it is a current deficit in the organization and a major opportunity for pharmacists.

The Institute of Healthcare Improvement created the Triple Aim as a framework method for healthcare advancement (Figure 1).[4] The Triple Aim framework works to improve the patient care experience, improve the health of a population and reduce healthcare costs

Figure 1.[4] Triple Aim

The IHI Triple Aim

Population Health

Experience of Care   Per Capita Cost

at the same time. Expecting competing healthcare organizations to work together or expand their current practices serves as a difficult task among companies. It took years for the concept to enter mainstream healthcare. Now, if you search "Triple Aim" on the internet, there are 108 million results.

Calabrese pointed to Felicity Homsted, a chief pharmacy officer of a patient-centered medical home, for providing Calabrese's favorite definition of population health management (PHM): "the active process of strategically utilizing health determinant data for a defined cohort to design, coordinate and deliver high-quality, cost effective, patient centered care across the continuum, through optimizing communication, collaboration and utilization of available resources with the goal of creating and sustaining health." The thought process of utilizing PHM is represented by Figure 2. To Calabrese, the key parts of population health management are "utilizing health determinant data for a defined cohort" and "creating and sustaining health." Pharmacists at the Summit mentioned how our current system is good at taking care of patients in the hospital, but we need to shift our focus to ensure that we take care of them out of the hospital. Before implementing population health management, an organization needs to be ready for the change. If an organization is ready to implement population health management, partners of the organization need to be able to collaborate, there has to be a favorable population density willing to change, a vision of long-term growth rates in the market, as well as clinical expertise and resources available to succeed. A discussion stemmed from this readiness about the challenge of competing organizations working together to help with PHM. Pharmacists at the Summit believe that this will be a major obstacle to overcome to implement these ideas. Adjustments will also need to be made in different organizations in order to reach out to people from different geographic areas. It will likely require a lot of trial and error and a diverse leadership team to implement these changes to meet the future demands of the patient. Two innovative PHM ideas were brought up to meet the demand of the changing population. Technology can be utilized to help with at-home monitoring through Skype visits, saving physicians time from going around the community from home to home. Another suggestion was an open table scheduling style similar to that of an urgent care to provide patients with care at the point in time they need it.

Figure 2. Thought Process of Utilizing PHM.

Big Data
With rapidly advancing technological development, the health system is seeing a flood of information, which can be overwhelming. Unfortunately, this overload of information may only produce a small insight into the direction of healthcare according to Calabrese. Calabrese explained the problem in our health system is not the overload of information, but the filter used to obtain the right information. Without a proper filter, the trends that an analyst is looking for will be masked by unrelated data.

Where does all this "Big Data" come from? The data is a byproduct of having electronic medical records. Doctors, nurses and pharmacists enter the patient health information into the hospital system where it is then shared between all of the patient's healthcare providers. This data can be collected and pooled together to analyze different trends in health outcomes.

The data around us can be used in many different ways, but the main goal is to "find the needles in the haystack" as Calabrese put it. By using the data to define the health population, information such as what disease states cost the most can be determined and used to find at-risk patients more affordable care to either prevent or treat the disease. This is also financially beneficial to the healthcare system. Additionally, this allows patients to be more engaged with their healthcare. Using at-home testing applications (apps) for smart phones is one way to ensure that patients are more adherent and happy with their care. Calabrese specifically touched on these smartphone apps as being a key feature in the future of healthcare. Apps that are able to tell the patient what pills to take and at what time, including features to notify family members if a dose is missed, will greatly improve adherence.

All of the data available support effective decision making for the future of the healthcare system. Calabrese uses the Enterprise Information Management & Analytics graph to show how to effectively advance the healthcare system and remain competitive in the market (Figure 3).[5] Calabrese described the bottom left as the basic analytics, which are questions that are asked in order to figure out what happened or what caused it with no questions pertaining to how the problem is able to be solved. Moving to the right and up in the chart to the green section is where the more proactive decision making happens. Calabrese then went on to explain that the top right area of the graph, predictive analysis and optimization, is where competitors are truly able to separate from one another.

Figure 3.[5] Supporting Effective Decision Making.
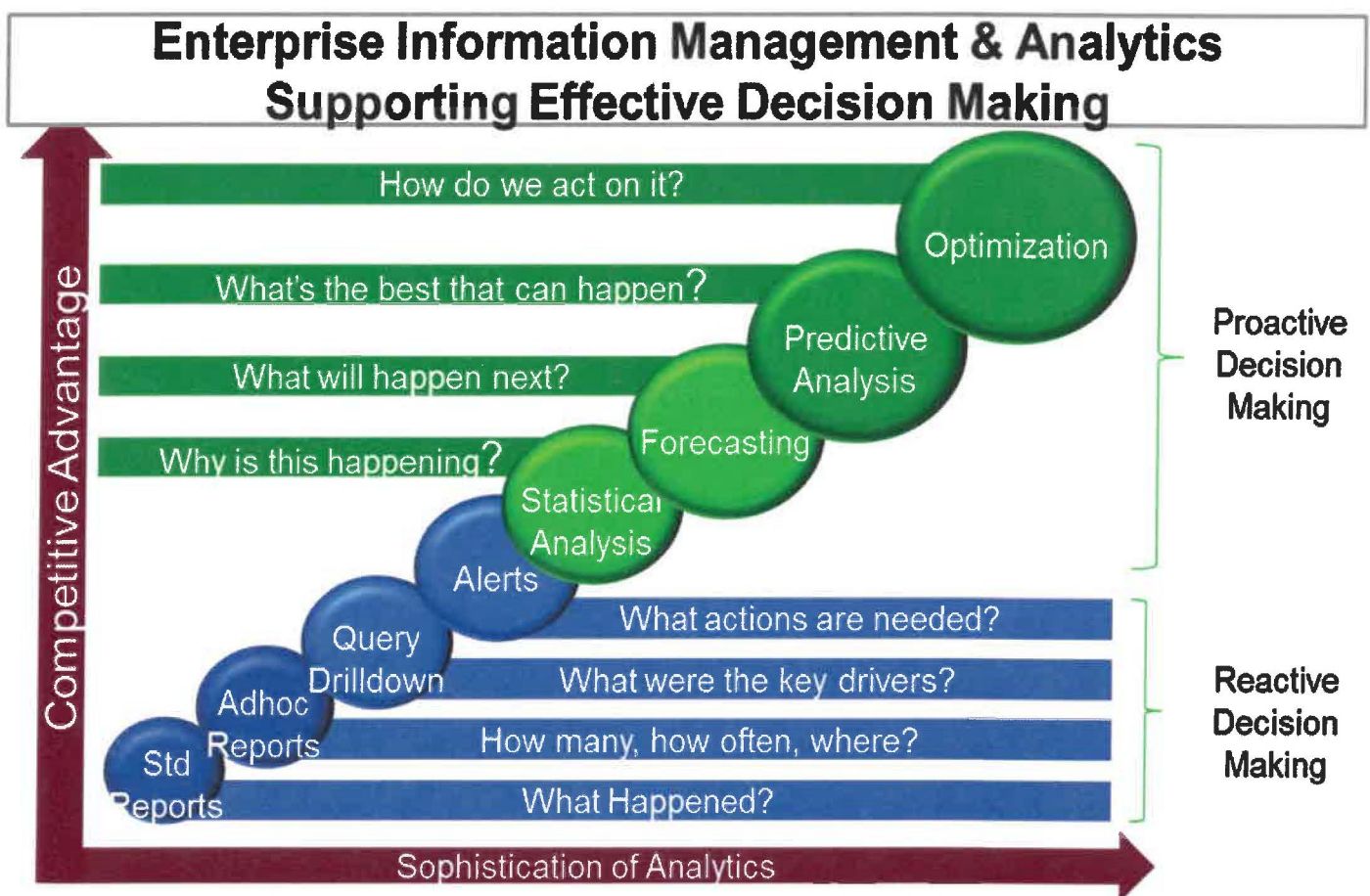
Enterprise Information Management & Analytics Supporting Effective Decision Making

Calabrese talked about how we, as pharmacists, are able to better identify and manage the high-risk and high-cost patients using the "Big Data" at hand. Calabrese listed several ways that this can be accomplished in pharmacy.

- Pharmacists need to be embedded in primary care and wellness assessments. Pharmacists should be performing comprehensive medication evaluations to determine whether a medication is needed, is being used correctly, or needs to be removed. Finally, Calabrese suggests that training on behavioral health medications be enhanced along with an increase in post-discharge follow-up calls. With these changes, the healthcare system will be able to more easily make the transition from providing volume-based care to providing instead more value-based care.

Volume-based to Value-based

Currently, one-fifth of fee-for-service Medicare beneficiaries discharged from the hospital are readmitted within 30 days.[6] These readmissions are costing about $12 billion per year and are all potentially preventable with improved care transitions. Value-based care relies on outcome-based payment, meaning that providers and healthcare systems get paid a set amount for a patient (Table 1). It is then the goal to ensure that the patient leaves the system without need to be readmitted for the same disease state. The incentive is value care so the care provided is effective and evidence-based with a focus on chronic disease states. Through value-based care, the goal is to work to manage or treat chronic disease states through continuous care by the provider. Providers must be predictive and treat patients proactively to ensure that they are staying healthy. To be able to provide this value-based care, it has become imperative that we collaborate with other healthcare providers to ensure that the continuum of care is appropriate for each patient relying on each provider's specialty to help to keep patients healthy.

Table 1.

	Volume-Based	Value-Based
Payment	Fee-for-service	Outcome-based
Incentives	Volume	Value
Focus	Acute episodes	Populations
Role of the Provider	Single episodes	Care continuum
Information	Retrospective	Predictive

To make the transition to value-based care, Calabrese believes we should take advantage of "Big Data." This data will help us to identify those high-risk patients so that we can assign pharmacists to them. This data will further help us to serve patients in underserved areas where a healthcare provider may be an hour or two away. By identifying those populations, we can use distance technology to provide virtual visits and home monitoring of patients. This would also be used so that patients can take the time they need to recuperate in their own home post discharge via communication with healthcare providers through Skype calls or a similar system.

There are many opportunities for pharmacists to help with the transition to value-based care. To ensure that we are providing value-based care, we need to increase the presence of pharmacists in every practice setting. One example is ambulatory pharmacy practice where pharmacists are embedded along with other healthcare professionals in the primary care of patients. In ambulatory care settings, pharmacists are able to perform comprehensive medication evaluations and wellness assessments. To continue the growth of pharmacists in this area, it is important that we increase the training of pharmacists in areas such as behavioral health. From there, pharmacists can do an even better job of determining proper medication use and watch for correct use versus misuse, overuse and underuse.

A participant at the Summit emphasized we cannot forget about the employer. We should be partnering with the employer to promote the health and wellness of their employees when possible. Ohio Northern University has a program that works with both the surrounding community and the employees of the university utilizing pharmacists and student pharmacists to promote wellness and provide tests to encourage employees to be healthy.

As the pharmacy world strives for value there will be obstacles. One such challenge is having the ability to change and understanding the difficulty of changing the healthcare plans. With this shift to value-based healthcare, there will most likely be a completely new way to get our healthcare. At the Summit, pharmacists discussed the likelihood that employers may give a certain amount of money to each employee to go to the marketplace and purchase their own insurance rather than the employers providing several different plans to choose from. With this foreseen upcoming change, pharmacists will also need to play a role in customer service that will be needed to help patients choose the best healthcare plans for each of them. Health coaching will also become a bigger aspect of healthcare as navigating and understanding the health system can be difficult for patients. Health insurance companies are starting to realize this and including it with some patients' coverage but, as pharmacy evolves, coaching will become increasingly important to ensure patients understand how to take care of themselves.

On Dec. 23, 2015, Ohio passed House Bill 188 with an effective date of March 23, 2016, allowing pharmacists to order blood and urine tests and analyze the results as well as remove, change or add new medications to the patient's drug therapy regimen.[7] Although the Ohio Board of Pharmacy has yet to detail what this means, this is a huge step in the direction of practicing value-based care. This evolution to value-based care allows pharmacists and other healthcare professionals to use resources to keep patients healthy and prevent readmissions within 30 days rather than using the resources for billing and other administrative tasks.

Conclusion

As healthcare continues to grow and innovate toward a more patient-centered outlook, pharmacists and organizations need to be willing to accept the changes and help their company stay on the forefront of technology by utilizing "Big Data" and value-based care to improve the overall population health.

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