In today’s ever-changing health care market, the need for more agile data to support population health, value-based revenue models, and market consolidation is only increasing. To leverage emerging advanced analytics technologies, you must have a clear picture of the who, what, where and why of your data. This commentary explores how to utilize governance capabilities and technologies to ensure you derive value from your analytics investments.

The amount and importance of data in managing patient care has grown exponentially, however outside of medical research, the health care industry does not have a strong data management or analytics culture [1]. Health care information has traditionally been managed application to application. This often leads to scattered and isolated information, and if we look at patient data specifically, most only think of it as being in the EHR (electronic health record).

The health care industry is shifting focus toward analytics, which puts pressure on organizations to repair their foundational data that is used to develop analytic models and insights. Patient data does not just reside in EHRs. It exists in financial, marketing, and research systems and increasingly in third-party sources external to the organization. The lack of integration of patient data leads to incomplete or out of context data. Instead of accepting the current state of siloed data sources, we need to take a more holistic approach to both how we look at health care information and how we define it across different contexts because data sharing is a critical component of data analysis. Siloed data makes analytical insights challenging, primarily because data in such a system doesn’t exist across different systems in a one-to-one format. Without a deep understanding of the source data, merging like data can be difficult and can introduce errors in the analysis. Moreover, siloed analysts may merge the same data sources slightly differently, which could result in different conclusions driven from the same data.

In addition to the plague of siloed datasets, a lack of standardized data governance processes is a major challenge. We can easily become overwhelmed by simply collecting or contributing data, never finding the time or resources for the linking and analysis that deliver insights. In one large health care provider, the data analysts spent up to 40 hours per project just validating data (data not shown). There was a severe lack of trust in the data because it was never defined holistically.

Simply adopting advanced analytical techniques may enable you to develop insights faster, but it does not address the underlying accuracy of the data being used to develop those insights. There is a strong push to implement machine learning, in which computer models rely on patterns to perform tasks, but if the machine is learning from bad information, will it really give you an accurate answer? More importantly, how will you know if the answer is accurate? It’s critical to implement an internal data governance program to understand the context of your information and how your business utilizes and consumes that information.

Designing a Governance Strategy

Data governance is the foundation of any analytics initiative. Leaders need actionable information, but too many organizations are collecting analytics for their own sake and not using them to make decisions. Bringing together disparate sources of data and looking at the patient holistically is extremely powerful. It gives clinicians the tools to help them make timely choices in treating patients.

A common data governance question in health care is where to start. Many organizations have difficulty gaining traction for governance programs. One option is to tie your initiatives to your corporate objectives. For example, most health care providers want to provide more on-demand services to their patients. To do that, you must know who your providers are, where they are, and what they do. Data governance provides the trusted source of information to support that corporate initiative. If nothing else, start defining your information. Start discovering and documenting your sources of data so you know where it is. These are the easiest places to start. You don’t need a large corporate initiative to do that and it will help you build the foundation for data governance going forward. Design your governance strategy...
based on your current culture and capabilities; your current culture should define your strategy and your strategy should change your culture (see Figure 1).

Understanding the data you have in context is critical for any analytics program. Understanding and being able to demonstrate the quality and lineage of your data mitigates the “Where did these numbers come from?” questions. Increasing trust in information enables leaders to make fact-based decisions (see Figure 2).

Advanced Analytics

When Atrium Health started our advanced analytics journey, we had to begin with an honest assessment of current capabilities, organization structure, and culture. We did not have any formal data governance structures in place, and like most health care organizations, data management was done in silos on an application-to-application basis. We knew there would have to be a major culture shift within the organization. That need led us to divide our Governance Strategic Plan into four phases: Foundation, Institutionalization, Realization, and Governance (see Table 1).

Executing our Governance Strategic Plan hinged on our ability to change long-standing, culturally embedded practices. To do that, we had to build partnerships across the organization and leverage existing structures to reinforce the need for change. One of the key tenets in health care is to protect our patients’ privacy. One of the first key relationships established by the Data Governance Office that

![Figure 1](Image)

**Figure 1.**
**Data Governance Enables Strategic Goals**

| Population health |
|-------------------|
| Identifying consumer data and integrating it across all care sites, identifying providers and associated outcomes, coordinating and improving care. |

| Interoperability |
|-----------------|
| 360-degree view of information from ALL sources to enable data exchange, integration, new insights and better decisions. |

| Unstructured content |
|----------------------|
| 80-90% of data is unstructured, but only a small percentage is leveraged for insights. Need to tie structured to unstructured. |

| Value-Based Payments |
|----------------------|
| All sources of data must be understood to allocate care to consumer, provider, org accurately. Compliance and reporting to third parties and CMS, PQRS, HEDIS. |

| Consumer engagement |
|---------------------|
| Exposing data to consumer and tying all information together. Exposing provider data to consumer, third parties. |

| Analytics |
|-----------|
| Patient or provider insight to best practices, best outcomes, outliers. Data quality essential to all forms of analytics to ensure trust. |

![Figure 2](Image)

**Figure 2.**
**Data Quality Maturity Approach**

| Data Readiness |
|----------------|
| Understand what data you have, where it is & how it is utilized |

| Data Integration & Cleansing |
|-----------------------------|
| Deliver trusted information in the right form, to the right place, at the right time |

| Data Consolidation |
|-------------------|
| Consolidate & harmonize diverse data & increase trust and reliability of information |

| Data Governance |
|-----------------|
| Technology that enables a repeatable process to manage the use, quality and lifecycle of information |

Source. Shannon Fuller.
helped to broaden our scope from just data governance to information governance was with the Corporate Privacy Department. This shift allowed us to start understanding how we were using our data and information as an organization. The rapid changes in the industry with respect to data and analytics required that we look at our practices not just through a legal and compliance lenses, but also from an ethical perspective. With emerging technical advances in data acquisition and analysis, it was no longer a question of just “could we?” but also “should we?”

Information and data governance are not just about improving data quality. A holistic governance strategy addresses how we store, access, and utilize data not only in our analytics initiatives but across the enterprise. For example, standardizing our race, ethnicity, language, and sexual orientation data was critical in identifying specific populations for health interventions (patient segmentation), analyzing the factors of social determinates of health, and understanding disparities in care. Information and data governance also enables nimble, proactive data analysis that supports a data-driven culture, which directly affect people’s lives—and can make their lives better (see Figure 3).

As health care practitioners, we need to be proactive in addressing issues of data quality, availability, risk, and privacy. Information governance is a key component in identifying and mitigating legal, operational, and compliance risks and above all ensuring the right people have the right data at the right time. NCMJ

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| TABLE 1. Atrium’s Governance Strategic Plan |
|--------------------------------------------|
| 1. Governance Organizational Model          |
| a. Develop a business case to staff the Data Governance Office (DGO) |
| b. Establish an operating rhythm for the Information Governance Council(s) |
| c. Develop operational training for data governance |
| 2. Governance Strategic Plan                |
| a. Design and implement a domain model      |
| b. Current/future state data architecture analysis |
| c. Develop a data governance operating model to support major initiatives |
| d. Develop a data quality program           |
| e. Implement a data security control plan   |
| 3. Governance Tactical Plan                |
| a. Implement a business glossary            |
| b. Select a master data management tool and/or methodology |
| c. Define a metadata strategy including data lineage |
| d. Develop standard operating procedures for project prioritization |
| 4. Promote a Governance Culture             |
| a. Create a governance roadshow to increase awareness of governance issues |
| b. Participate in industry forums, conferences, and groups |
| c. Build a process to evaluate and align governance initiatives |
| d. Form an education committee to drive governance training and communications |

Figure 3. Health Care Organizations Need an Information Governance Strategy

| How We Store Data | How We Access Data | How We Use Data |
|-------------------|--------------------|-----------------|
| Growth            | Increase the quality, breadth and depth of data we store for the modeling and analytics communities | Enable teams to access volumes of information previously unreachable | Derive insight from volumes and quality of data now accessible to drive process, product, pricing, and other innovation |
| Reduce Cost       | Remove redundancies and increase efficiency in how data is stored | Reduce the number of times data is moved to clean and stage it for use | Remove complexity to enable users to focus on data analysis. Streamline and rationalize reports to reduce overhead and enhance LOB level reporting |
| Reduce Risk       | Establish definitions and standards for the data available, so that we know what we have, where it sits and that it is high quality | Provide a trusted and simpler way to access the data so that it can used more easily, with confidence | Build sources of truth to improve regulatory reporting and reduce fraud / operational losses |

Source. Shannon Fuller.