

# Building a BI/Analytics Foundation



**Orion Health White Paper**

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## Effective population health in the era of value-based care

The U.S. ranks 46th among 48 countries listed in a 2013 Bloomberg ranking of nations with the most efficient healthcare systems. As a world leader, the U.S. has a long way to go to catch up with other industrialized nations. For example:

- There is a 28% EHR adoption rate
- 15% of patients account for 80% of healthcare costs
- Only 24% of primary care practitioners are notified of an emergency department admission

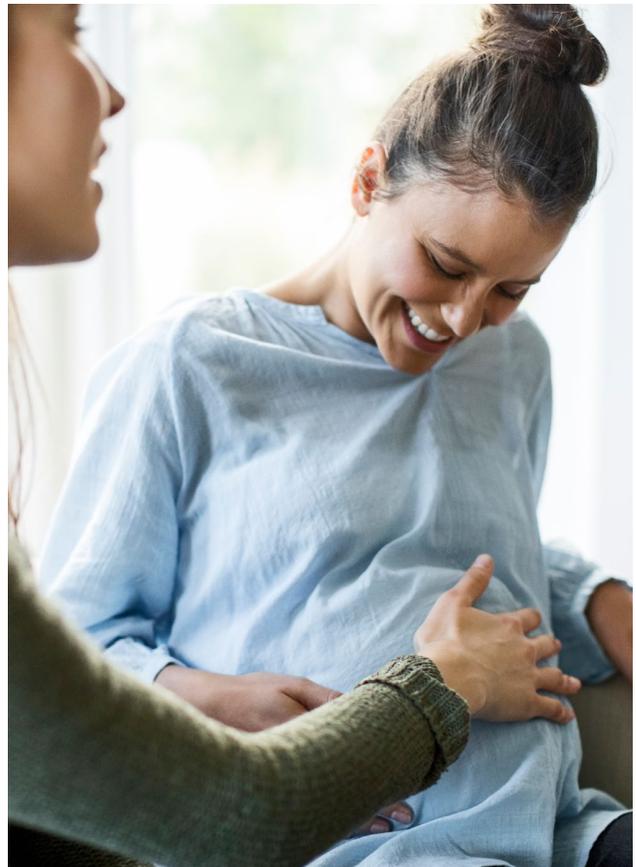
Today, healthcare reform, and more specifically the shift toward value-based reimbursements, has created a clear need for hospitals and health systems to focus on fixing the problems that persist in the healthcare system. Organizations are investing heavily in analytics and big data technologies to improve population health management initiatives by optimizing cost structures and coordinating care both internally and across broader healthcare communities.

Working with some of the nation's leading provider, payer, and governmental organizations, we have seen too many cases where this investment has fallen far short of expectations. Most of these failed or underperforming population health management initiatives are doomed from their earliest stages for two critical reasons:

- Healthcare organizations consistently fail to ensure that their initiative rests on a data foundation that is comprehensive, accurate, normalized, accessible and actionable for a range of constituencies.

- These organizations fail to embrace proven best practices at each stage of the initiative, from initial data acquisition and architecture all the way to actually effecting change at the point of care and in the back office.

This is the first in a series of perspective papers addressing these common and costly pitfalls. In this paper we will focus primarily on building the foundation for and ensuring success of analytics and business intelligence (BI) for population health initiatives. Future papers will drill down further into best practices for driving adoption and care coordination.



## Foundational data and architecture

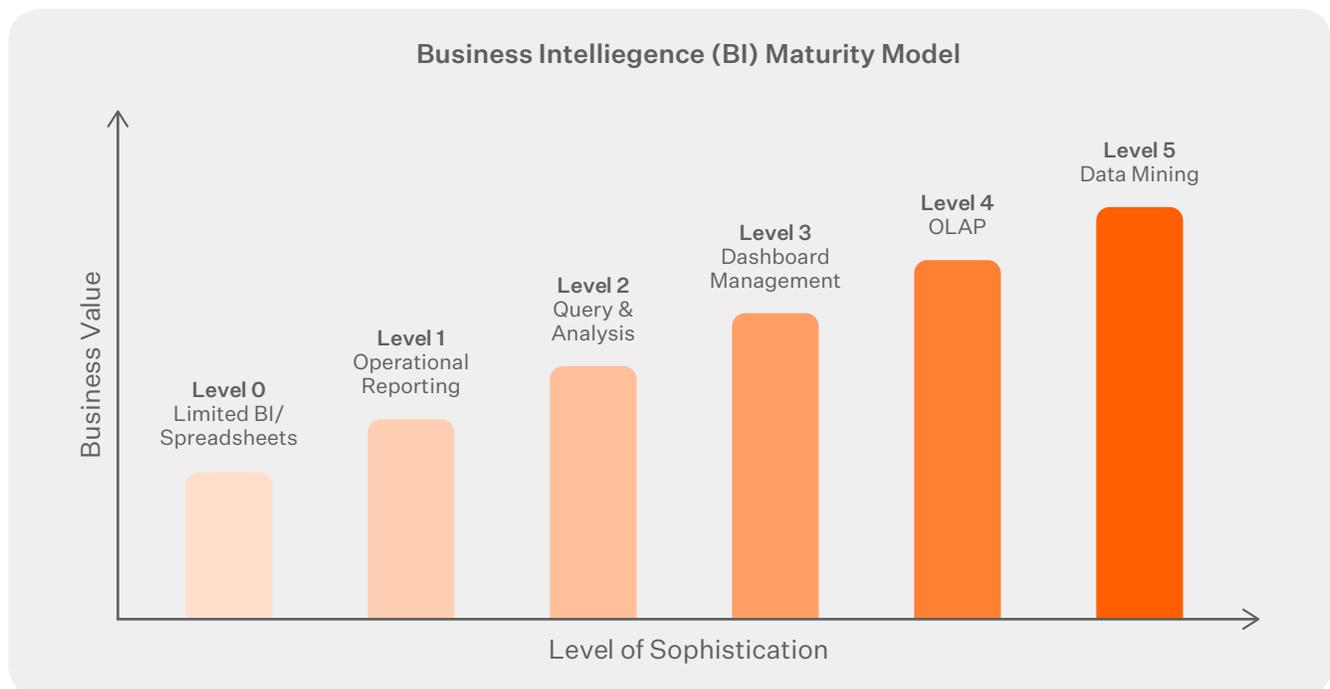
Any analytics/BI system is only as good as the information that goes into it. There are a number of technologies available to make sure the right data is going into the system. This acquisition involves pulling relevant and authorized data elements out of source systems such as medical records, clinical order entry, nursing documentation, claims payments, etc., and creating a management structure that supports the development of a framework for data quality and governance.

The standard approach to acquiring data is through extract, transform, and load (ETL) processes, which are run in batches on a periodic schedule, depending on the purpose of the analysis. Organizations are increasingly realizing the importance of frequent updates so that information can be analyzed more quickly and made available in real time. Equally important is employing the right integration engine in order to normalize and combine information from different sources. This not only reduces duplications,

but also works to standardize and unify data so that it becomes increasingly meaningful across the enterprise.

Once the foundational data is in place, a roadmap is needed to describe the plan for building the information architecture and identifying the tools/delivery that will be used. An integral component of this architecture is the enterprise master patient index (EMPI), a technology that ensures accurate identification of patients, providers and facilities so that the system does not associate data with the wrong John Smith, Dr. Jones or Baptist Hospital. This is critical for ensuring that information is consistent and accurate throughout the organization.

For health systems to perform effective population health management they need to achieve a fairly high level of sophistication in their BI approach. One common model for BI sophistication identifies six levels:



For healthcare organizations, BI sophistication models start with data that is accessed via complex tools by expert analysts who are trained in the structured query language (SQL) of the database. The next level is the ability to pull basic, canned reports from the system. From there, a self-service level allows for the creation of interactive reports where users can drill down into and explore areas of interest and create dashboards focusing on custom KPIs. The ultimate level of sophistication for BI in healthcare is the ability to both create EIS for busy senior executives to have easy access to a high level of select KPIs and then further - direct integration into the EHR at the point of care.

Investing in these tools will help organizations build the foundation they need for optimal utilization and future flexibility and scalability, and help them achieve a single version of the truth across the enterprise and community to enable population health management<sup>1</sup>.

## Best Practices for Implementation

In our experience, employing best practices is critical to the success of any population health management initiative, perhaps even more so than cutting-edge technology. One of the top reasons why we have seen these initiatives fail is because they are started and driven by the IT director or CIO. The organizations we have worked with that have found success in these endeavors involved the clinical, finance, operations, and executive teams from the beginning, with the C-suite clearly articulating the need for clinical, IT, and business to work together.

This team of experts must define the different user scenarios, deciding who needs to have access to the data and in what context, in order to drive the most informed

decision making. From there, they should further boil down the scenarios and identify the types of data that is needed to support analysis and measurement. For each type of data, the source systems need to be identified. This is where data governance enters the picture: Who enters the data? When? Why? How frequently? And, is it structured?

- If structured, is it expressed via standard or proprietary terminology?
- If unstructured, can it be transformed into structured data?

If the needed data is not captured in any system, there needs to be a process to determine how the capture of data can be introduced into the workflow of the role it would most likely encounter.

Bringing together key constituencies for effective project management will help to ensure the success of the program. “Super users” -- those who will be using the data most frequently - should spearhead rollout. The super users should receive ongoing training and updates so they can stay knowledgeable about new technologies.

As healthcare organizations contemplate these major investments of time and money into analytics/BI, they need to work with the right partners who can bring in leadership and expertise from the beginning. Such guidance will help avoid fundamental mistakes that will limit the usefulness of the project down the road. Focusing on building a solid data foundation and applying best practices for implementation are critical factors in achieving successful analytics and BI.

*Next: future papers will focus on best practices for care coordination and driving adoption.*

## Callouts

Both Payer and Provider Organizations:

- Are data rich but information poor
- Can't trust source data
- Have rampant data quality issues with little or no data profiling
- Lack formal data governance practices
- Lack precise information to base decisions on

## Key Analytics/BI Discovery Questions for Healthcare Organizations:

1. What are the BI team's vision and priorities?
2. Do you presently have a data governance program?
3. Does the BI effort directly support business priorities?
4. What are the guiding principles around your BI program?
5. What are your organization's pain points from a reporting standpoint?

	Past	Present	Future
Information	What happened? (Reporting)	What is happening now? (Alerts)	What will happen? (Extrapolation)
Insight	How and why did it happen? (Modelling, Experimental Design)	What's the next best action? (Recommendation)	What's the best/worst that can happen? (Prediction, Optimization, Simulation)



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