CHIEF DATA & ANALYTICS OFFICERS SUMMIT

October 6, 2016

Population Health: Organizational and Data Governance, and Analytics Strategies

Prepared for the Scottsdale Institute

By Kevin Lamb, Health Catalyst

Executive Summary: The Scottsdale Institute convened 13 data, analytics, and information executives in Chicago for the 2016 SI Chief Data and Analytics Officers Summit on Oct. 6, 2016. They gathered to share issues, insights and lessons learned on the journey to population health, with specific focus on the governance and management of data and analytics. Attendees represented large academic medical centers, multi-regional health systems, rural hospitals and clinics, and physician networks from across the nation.

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SUMMIT PARTICIPANTS

> Albert Duntugan, Senior Director of Enterprise Information Architecture – UCLA Health

> Tina Esposito, VP, Center for Health Information Services – Advocate Health Care

> Mark Hohulin, SVP, Healthcare Analytics, OSF Innovation – OSF HealthCare System

> Rick Howard, Senior Director, Business Development – Ascension Information Services

> Miriam Morales, Director for Strategic Analytics – Mischer Neuroscience Associates, Memorial Hermann Health System

> Deborah O'Dell, VP, Business Intelligence – Catholic Health Initiatives

> John Pirolo, MD, SVP & CMIO – Ascension

> Julia Swanson, VP Performance Analytics & Improvement – Henry Ford Health System

> Dellara Terry, MD, Medical Director for Population Health Management, Clinical Analytics – Partners HealthCare System

> Randy Thompson, MD, CMIO/Security – Billings Clinic

> Christine Watts, Chief Enterprise Architect – The University of Chicago Medicine

> Eric Yablonka, VP & CIO – The University of Chicago Medicine

> Timothy Zeddies, PhD, VP, System Analytics & Data Governance – Spectrum Health

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MODERATOR: HEALTH CATALYST

> Tom Burton

What's Keeping CEOs Up at Night

To kick the discussion off, participants were asked to share what's keeping their CEOs as well as themselves up at night. What are the big issues and barriers facing the nation's healthcare systems? One common theme was the move from fee-for-service to value-based payment models, a concern voiced by several in the room, but shared by all. Dellara (Lara) Terry, MD of Partners explained that there is "an unquenchable thirst for data analytics" and therefore the goal is to "focus on where there is the greatest opportunity for care and system improvement." Timothy Zeddies, PhD of Spectrum agreed, saying "there is a tidal wave of desire for this kind of information" and the challenge is putting in place the infrastructure to support that. Randy Thompson, MD at Billings Clinic pointed out that his CEO believes "the future of medicine is analytics."

Catholic Health Initiatives
Imagine better health.℠

"Doing the right thing even if it is only a small percentage of current revenue."

Deborah O'Dell, VP, Business Intelligence, Catholic Health Initiatives

A second common issue was the pace of change, whether it's with accountable care, marketplaces or trends. Deborah O'Dell of Catholic Health Initiatives (CHI) acknowledged that this shift to value-based care means "doing the right thing even if it is only a small percentage of current revenue." Eric Yablonka with The University of Chicago Medicine commented that Chicago is a rapidly changing marketplace, quickly catching up to where other markets have been for some time in dealing with this shift to value-based care. For Julia Swanson of Henry Ford Health System, provider-side analytics teams are paired with performance improvement teams and one source of insomnia is "having the right information to make decisions and getting that information to the right people." Miriam Morales at Memorial Hermann expressed a similar concern in "getting the data to the people who need it most in a useful and reliable way." Albert Duntugan of UCLA Health said his CEO was concerned with "how to blend the university's mission of research while maintaining profitability in a challenging environment of narrow networks." John Pirolo, MD at Ascension explained that managing the rate of change is his highest priority. Rick Howard at Ascension Information Services said his challenge is "leveraging and utilizing data across the system and turning data into answers, whether it's clinical, financial or operational."

UCLA Health

"How to blend the university's mission of research while maintaining profitability in a challenging environment of narrow networks."

Albert Duntugan, Senior Director of Enterprise Information Architecture, UCLA Health

TRANSITIONING TO THE ECONOMICS OF VALUE-BASED CARE

Tom Burton of Health Catalyst provided this framework for understanding the overall journey to population health and the shift to value based care, acknowledging that managing the pace of change is a universal challenge.
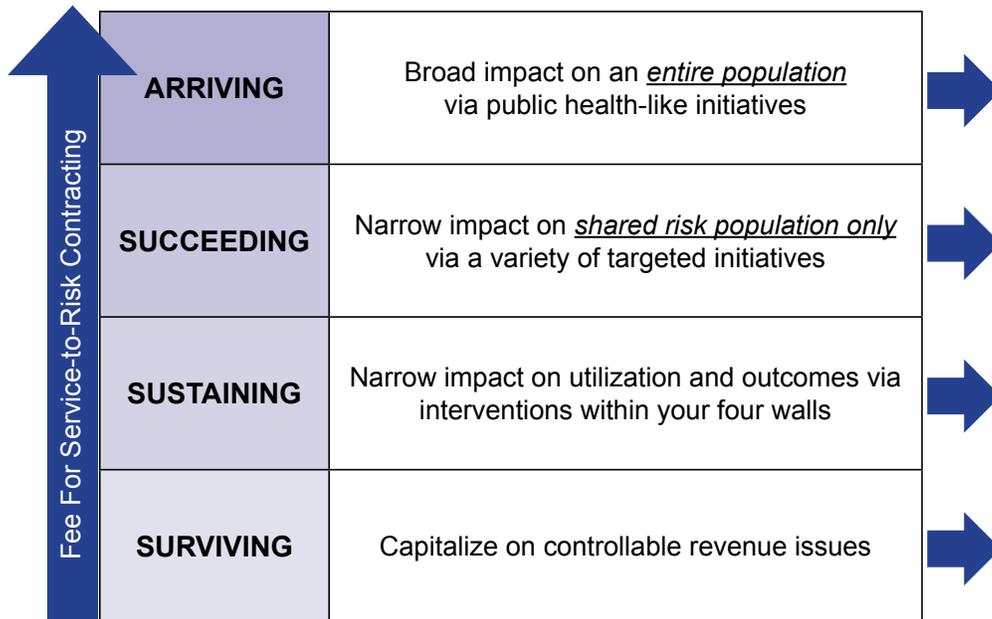

Figure 1: The jounrey to population health.

The resulting discussion focused on the fact that these stages were not experienced in a stepwise fashion, rather all four were experienced simultaneously, depending on market conditions and organizational priorities. These "pockets of improvement" might be found in specific clinical areas, for example, whereas in other cases an improvement effort gets started and then priorities change and the organization is unable to sustain the change. Tina Esposito at Advocate Health Care pointed out that this challenge of planning for accountable care while still getting paid fee-for-service demands an "incredible need to innovate." She added, "This translates into an overriding need for analytics and measurement as a centralized focus, for example our focus on Patient Safety, with the goal of 'zero defects' by 2020."

While all participants acknowledged they were active in all stages simultaneously, most agreed they were somewhere between sustaining and succeeding overall.

POPULATION HEALTH: MOTIVATION AND TIMEFRAME

Tom Burton of Health Catalyst offered a model to address this challenge by looking at what is motivating an organization to change and how quickly. The first dimension (the x-axis) is *Motivation*, where some organizations are motivated toward population health in financial and operational ways, and others are motivated clinically. The second dimension (the y-axis) is

Timeframe, with some organizations thinking long-term and others short-term. These dimensions create the following four quadrants of population health efforts:

1. Long-term financial/operational
2. Short-term financial/operational
3. Long-term model of care
4. Short-term model of care

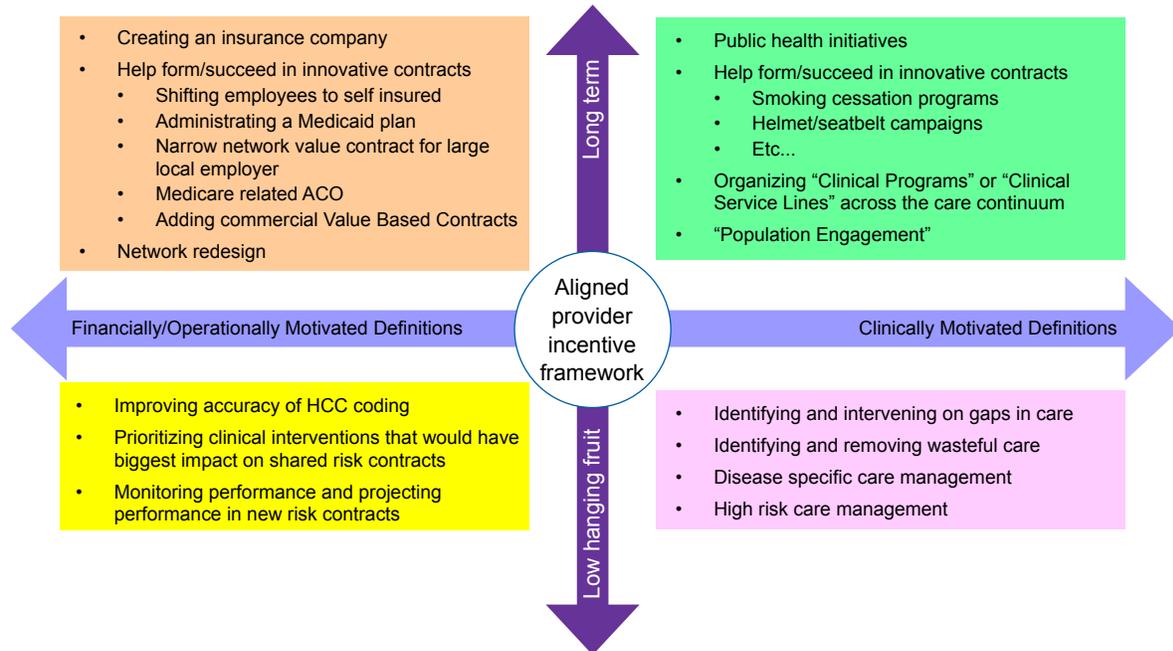### MOTIVATION AND TIMEFRAME

Figure 2: The dimensions of population health.

Organizations in each quadrant are working on different programs to achieve different incentives, but the group agreed that success in the long-term strategies requires success in the short-term tactics, i.e., working in multiple quadrants simultaneously.

Julia Swanson said, "Sometimes we think we have to do it all. We can move everything an inch, but we need to take some key areas, focus efforts and resources on those, build organizational capabilities and then move on. We need to make sure that we do not spread improvement like peanut butter."

Dr. John Pirolo said Ascension "is spending a lot of time in the two upper quadrants (Figure 2) on strategy, and lots of time in the two lower quadrants tactically, working to gain enterprise momentum moving toward getting into the top two quadrants." Christine Watts, The University of Chicago Medicine, said that "what we struggle with is knowing how fast we should go, how to get people on board, and how the long-term strategies should translate into short-term efforts."

With one foot in the fee-for-service world and the other in value-based payments, it's difficult to know what kind of message to send providers to get them aligned. These observations led right to the point being made, that healthcare organizations have to accept the challenge of working in all four quadrants at the same time.

REQUIRED CAPABILITIES FOR IMPROVEMENT

Efforts at improvement require the synergy of multiple processes and systems, not just technology. Three core capabilities are needed for clinical, cost and experience outcomes improvement:

1. Best Practice—what the system should be doing;

2. Analytics—how we measure and predict how the organization is doing;

3. Adoption—how to change and what pace of change can be tolerated.

Systematic outcomes improvements are possible when all three of these capabilities are in play, but they can be scaled only when the psychology of outcomes improvement is embedded within the leadership, culture and governance of the organization and when everyone is financially aligned.

The Need for Governance

The need for governance of data and data-related initiatives was a critical issue raised by the group. When participants were asked about the most prevalent symptoms of less-effective governance within their organizations, three issues echoed:

1. The inability to say 'no' to lower priority projects;

2. The light efforts in many areas with no deep efforts on the critical few; and

3. The lack of initiatives spreading across the organization.

Eric Yablonka, at The University of Chicago Medicine, said, "We have many important priorities and everyone with an enterprise view sees all those priorities, so there are challenges around allocation."

THE FOUR PRINCIPLES OF OUTCOMES GOVERNANCE

Tom Burton suggested that well-designed governance significantly helps with optimally allocating scarce resources and increasing the breadth and depth of improvements. He outlined four core principles of effective outcomes governance:

Principle #1: Starting at the top, engage all stakeholders around a common vision.
The keys to executing this principle center on knowing which stakeholders should be considered part of the improvement governance team and the level of engagement that should be expected of each stakeholder. Primary stakeholders should include, among other traits, those who control funding, those who carry influence and specific domain knowledge, and those who will be impacted by process changes.

"We have many important priorities and everyone with an enterprise view sees all those priorities, so there are challenges around allocation."

Eric Yablonka, VP & CIO, The University of Chicago Medicine

SPECTRUM HEALTH

"We need governance to have capital allocation. Until recently, our budgeting process has been very specialized and decentralized. There have been 15 or 20 different executives fighting to get that operational budget. In our organization, the executive level has been missing in governance."

Timothy Zeddies, PhD,
VP, System Analytics
& Data Governance,
Spectrum Health

To this effect, Timothy Zeddies, PhD of Spectrum Health said, "We need governance to have capital allocation. Until recently, our budgeting process has been very specialized and decentralized. There have been 15 or 20 different executives fighting to get that operational budget. In our organization, the executive level has been missing in governance." Dr. Randy Thompson, Billings Clinic, said, "We have a relatively immature governance structure, less than a year old. We have the right people at the table, but we need to decide what it is they do."

If stakeholder engagement requires four sub-initiatives—executive, domain leadership, adoption and innovation—the executive is critical in launching the overall stakeholder initiative through:

1. **A call to action**—assigning the overall champion, the influencer; explaining why outcomes improvement and governance are important; and communicating the program system-wide, which is often overlooked.

2. **Form the leadership team**—recruiting members with the right characteristics; approving a leadership team charter; establishing decision-making and prioritization processes.

Deborah O'Dell, Catholic Health Initiatives, said, "In healthcare, we educate and train people to be specialists, so fundamentally, as an industry, we don't work together to accomplish a common goal. Within the data group, we are constantly telling other people to talk to each other. I've started national governance efforts where we join people with similar titles and we have to introduce them to each other even though they work in the same building. This may be a cultural issue within our industry and not unique to any one organization."

Billings Clinic

"We have a relatively immature governance structure, less than a year old. We have the right people at the table, but we need to decide what it is they do."

Randy Thompson, MD,
CMIO/Security, Billings Clinic

Principle #2: Have a common understanding of organizational needs, capabilities and readiness.
The stakeholders must have a clear understanding of the organization's needs around outcomes improvement, as well as its state of readiness, and capabilities and willingness to change. This leads to the third and fourth steps for establishing outcomes governance:

3. **Identify high-level opportunities**—this is a leadership team responsibility and the opportunities must link to the organization's strategic objectives, using a formal key process analysis to accomplish this.

4. **Assess organizational capabilities and readiness**—understand barriers to outcomes improvement success; understand the three dimensions of readiness; map the five key capability areas; and prepare an action plan to close the gaps.

The group held a discussion about this principle and the key resources that are often scarce in trying to meet organizational needs. Rick Howard of Ascension Information Services said, "We are still trying to ascertain where our targets are. We have challenges on the technical side with the number of sourcing systems that we pull information from and variation in data, as well as from the functional side, addressing things like resistance to change or even a resistance to realizing why change is necessary."

Julia Swanson said that Henry Ford Health System is attempting to build off the governance structure that was put into place when it implemented its EHR. "We had pulled people together from disparate business units and asked them to be on our common build, with common policies and common processes, and those teams continue. We find the best success when we assign and co-locate performance-improvement and analytics staff with operations. They are centrally connected for training and standardization, but embedded with the teams that are trying to improve things."

> "We are still trying to ascertain where our targets are."
>
> **Rick Howard**, Senior Director, Business Development, Ascension Information Services

Principle #3: Use a consistent improvement methodology, align incentives and balance polarities.

This is perhaps the most difficult principle to achieve because of how resource ownership tends to be siloed. Aligning objectives is challenged by varying incentives among hospital administrators and physicians. It must be approached by uncovering hidden or misaligned objectives among these key stakeholders.

The solutions are to develop a consistent improvement methodology, change all compensation incentives of key stakeholders and balance polarities through new policies and processes. This leads to steps five and six.

5. **Adopt a consistent improvement methodology**—all members of the leadership team are trained and prepared to begin improvement work and a training plan is in place for improvement teams.

6. **Align incentives**—compensation incentives must be aligned with shared objectives for outcomes improvement to succeed.

> "We had pulled people together from disparate business units and asked them to be on our common build, with common policies and common processes, and those teams continue."
>
> **Julia Swanson**, VP Performance Analytics & Improvement, Henry Ford Health System

Tom Burton noted, "Intermountain Healthcare changed the incentive structure so the administrators had clinical goals, the CMO had financial goals and the COO supported research goals. Having everyone with the same incentive structure and goals can massively improve alignment and collaboration."

Tina Esposito from Advocate Health Care added to this principle, saying, "I think we need more focus. You can have 20 goals, but if you have too many, they become diluted. We need to focus on just a few clinical goals, otherwise alignment becomes too chaotic."

PROBLEM OR POLARITY?

This third principle also deals with balancing polarities. Healthcare has polarities, which are different from problems. Problems have solutions. Polarities are not fully solvable, but are the symbiosis of two good things, for example perfect data versus data to improve things. Balance is required without getting to an extreme at one end at the expense of the other good thing. This leads to step number seven in the outcomes governance process.

"I think we need more focus. You can have 20 goals, but if you have too many, they become diluted. We need to focus on just a few clinical goals, otherwise alignment becomes too chaotic."

Tina Esposito, VP, Center for Health Information Services, Advocate Health Care

7. **Keep polarities in balance**—prioritize the top five polarities and then create or revise policies to balance them.

POLARITIES EXAMPLES

Key Governance Polarities

- Data protection AND data sharing
- Financial performance AND improved care delivery
- Information transparency AND information privacy
- Improve regulatory metrics AND improve metrics most correlated to outcomes
- Data accuracy AND time to decision
- Data for learning AND data for research
- Spread and sustain improvement AND promote new improvements
- Clinician AND patient decision making
- Organizational goals AND payer incentive

Other Polarities in Healthcare

- Quality AND cost
- Value AND volume
- Stability AND change
- Care (mission) AND cost (margin)
- Patient needs AND staff needs
- Standardization AND customization
- Patient experience AND medical outcome
- Clinical goals AND administrative strategy
- Process AND outcomes
- Primary care AND specialty care

Figure 3: Examples of polarities in healthcare.

Timothy Zeddies said, "We struggle with the polarity of sustaining improvements while promoting new improvements. New improvements demand a continuous stream of information to sustain them, which draws resources and means fewer opportunities to work on other new improvements."

Dr. John Pirolo said Ascension struggles with two polarities, data accuracy/time to decision, and sustaining/promoting new improvements. "We try to get the organization to realize that it doesn't need pristine, 100-percent-accurate data to draw directional conclusions and act. We have had initiatives where we have spent months trying to churn out the perfect crystal of knowledge. It is also a challenge for us to fully hardwire one initiative before moving on to the next."

"We try to get the organization to realize that it doesn't need pristine, 100-percent-accurate data to draw directional conclusions and act."

John Pirolo, MD, SVP & CMIO, Ascension

Principle #4: Focus: Practice disciplined decision-making to prioritize, fund, organize and sustain improvements.

What should your organization choose not to do? This is a tough question to answer. This principle is about focus, which leads to the final four steps on this journey:

8. **Analyze opportunities and determine priorities**—identify and sequence the initial improvement initiatives and agree on the resources and teams needed to proceed.

9. **Allocate resources**—vet the resource allocation plan and get it approved.

10. **Establish prioritized teams**—start with a Guidance Team and develop teams at all levels to promote broad adoption.

11. **Extend and sustain improvement**—establish outcomes improvement as a way of life in the organization with sustained improvements of greater than six months.

In a final review of the outcomes governance process, the group revisited the different symptoms of less-effective governance that tend to present within healthcare organizations and which of the four principles should be examined to deal effectively with each of them. We concluded the discussion by acknowledging that it's hard work, but that even highly dysfunctional organizations have significantly improved by pursuing these principles.

The Need for Data Integration

The topic of data integration is a hot one and a handful of subtopics garnered the most attention. For example, among payers, providers and patients, who owns data? Data sharing carries the burdens of confidentiality, legal liability, relevance and difficulty of sharing. The storing, sharing and analysis of data is the bedrock of population health. Inpatient and outpatient episodes of care among entire patient populations generate an abundance of data, yet it all exists in silos and the multitude of data sources aren't integrated.

Hospital systems come at this challenge in many different ways and participants shared their architecture and tactical approaches. The encyclopedia of technology and analytics providers was represented, including the major EHRs (Epic, Cerner, McKesson, Allscripts), data warehouses, analytics platforms, and population health management tools (Hadoop, Health Catalyst, HealtheIntent, Optum One, Caradigm).

Miriam Morales said that Memorial Hermann "just started with HealtheIntent, so we are getting a lot of different data into that system. We are in the beginning stages of outlining how these data will integrate with existing systems, data governance, and how to leverage data across the system."

Albert Duntugan said that UCLA Health is doing a lot of early binding of data through their Epic data warehouse, which requires substantial upfront resources to do mapping and documentation of lineage. He also said that the changing specifications from payers and monitoring of data quality requires constant vigilance from a small team of business analysts, data-quality specialists and ETL programmers. Regarding payer-provided data, Duntugan said that payers have varying levels of quality and completeness depending on the size and sophistication of the payer organization.

Partners' Dr. Lara Terry said, "In our Enterprise Data Warehouse we combine claims and clinical data in an integration layer. It's very effective and facilitates our analysts' work."

"We are in the beginning stages of outlining how these data will integrate with existing systems, data governance, and how to leverage data across the system."

Miriam Morales, Director for Strategic Analytics, Mischer Neuroscience Associates, Memorial Hermann Health System

PARTNERS HEALTHCARE

FOUNDED BY BRIGHAM AND WOMEN'S HOSPITAL AND MASSACHUSETTS GENERAL HOSPITAL

Dellara (Lara) Terry, MD, Medical Director for Population Health Management, Clinical Analytics, Partners HealthCare System

"In our Enterprise Data Warehouse we combine claims and clinical data in an integration layer. It's very effective and facilitates our analysts' work."

The group raised the issue of incorporating unstructured data into analytics. Ascension is experimenting with using Natural Language Processing (NLP) for physician transcriptions and nursing notes to derive meaningful clinical information. The challenge is defining standard dictionary sets. Billings Clinic uses unstructured data more for clinical decision support than for true analytics. Their transcription vendor runs their notes and reports through an NLP engine.

The conversation then turned to data quality and the issues of data accuracy, timeliness and completeness. The language of healthcare data has many 'dialects' that continue to interfere with the sharing and mapping of patient information. While standards exist, too many entities along the

prospective interoperability pipeline don't use them. It was noted, "If standards were used in telecom the way they are used in healthcare, then switchboard operators would still be connecting calls." Standards exist on the billing side, with ICD-10 and CPT codes, but formal, structured, clinical data across disparate systems doesn't exist.

DATA SECURITY ISSUES

The demand for role-level security is increasing with increasing data integration. Defining who gets access to what subsets of data is the responsibility of several leadership groups at Ascension. Rick Howard said, "We have some location-specific security roles that we're trying to identify. For example, with our employed physicians, we have some information that only the dyad leadership can review because of the sensitivity of the data."

> "If standards were used in telecom the way they are used in healthcare, then switchboard operators would still be connecting calls."

Having enterprise-level and role-based access needs uniform roles defined across the entire enterprise. This calls for some handshake activity with HR to rebuild infrastructure for mapping access to titles. Eric Yablonka said, "We are trying to do the right thing, but we can't continue to do it in an agile way without process improvements," thus implying the need for this infrastructure remodel.

> "As we consider outsourcing, offshoring and sharing information on exchanges, we have to consider how we secure that data in and outside of the organization."

Christine Watts, Chief Enterprise Architect, The University of Chicago Medicine

Christine Watts voiced a concern with the volume and variety of software vendors and their impact on security. "We integrate data across many different solutions across our organization. Some of these are custom-built solutions, but many are packaged software solutions that are hosted both internally and externally to our environment. We must move data across our entire network. As we consider outsourcing, offshoring and sharing information on exchanges, we have to consider how we secure that data in and outside of the organization."

Deborah O'Dell said that, with regard to vendor contracting, there are challenges with people signing contracts when they don't have any experience in backend data platforms. This can result in one vendor being out of compliance with basic data-security protocols because they outsource to—and share data with—a second vendor.

The security conversation continued with the majority of attendee organizations identifying at a SOC II level security protocol.

The Need for Social Determinants of Health

Along with patient-reported outcomes and activity-based costing data, population health requires incorporating social determinants of health: education, employment, income, community support, and family and social support data. This introduces new elements of data consent, data storage and data curation, as well as the time to track it all. Tina Esposito said this adds more to how we govern data. "We're late to the party. We pull all this data together and it's clear that we don't have one person as an asset in the organization who knows all the data. We have to bring leaders of knowledge together. We need to be clear on how we use all these datasets."

...AND LONGITUDINAL DATA MANAGEMENT

Population health requires lifetime engagement of entire patient populations and managing longitudinal data. To manage the profile of a patient over time can involve 60 or 70 source transactional systems flowing into a data warehouse. Longitudinally connecting an individual patient's data from all these sources requires a unique strategy and some thought about who owns the data. Dr. Randy Thompson said, "We get all this different data that lands in our data mart, but there's no way to see the sequence of events as a patient progresses through our system."

> "We're late to the party. We pull all this data together and it's clear that we don't have one person as an asset in the organization who knows all the data."
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Tom Burton at Health Catalyst talked about the work that Anne Milgram, former New Jersey Attorney General, is doing with analytics to reform the criminal justice system. Social determinants of health have a large overlap with the social determinants of crime. The economics that drive our criminal justice system thrive on crime not innocence. He wondered if anyone has started to experiment with bringing in criminal justice data to enhance predictive modeling and drill into root causes. This raised the prospect of medical ethics and bias in providing care, but it was also agreed that this type of data could prove helpful. We need to treat the whole person and the more information we know about the whole person the more accurate the care we can provide.

Tom Burton also shared a story of population health mimicking public health in New Ulm, Minnesota, where they conducted geospatial analysis to see hotspots of inactivity and chronic illness and disease. They then used that data to deploy community services and activities for promoting health and wellness, generating impressive results over a ten-year period.

> "We get all this different data that lands in our data mart, but there's no way to see the sequence of events as a patient progresses through our system."
>
> **Randy Thompson, MD**, CMIO/Security, Billings Clinic

The group agreed that not everything in population health is a big-data, high-cost issue. Sometimes it's simply a matter of engaging with the community. For example, when Catholic Health Initiatives (CHI) found that teenage drivers in a small Midwestern town experienced a high number of accidents during the winter because they were driving to a nearby town to see movies, CHI built the town a movie theater. The result was a dramatic drop in auto accidents.

The group discussed patient-reported outcomes as another component of longitudinal data. More patients want more doctors to use measurements from their fitness devices. But this brings up more issues of data accuracy, validation, storage, liability and usage. Fitness devices and wellness programs are great motivational tools, but the consensus was that the popular devices lack the data quality required for population health. "We have a FitBit-type device whose heart-rate monitoring is unproven scientifcally," said Eric Yablonka, "but everybody talks about we need to get connected health data."

> "When the request for analytics comes in, there's a senior level discussion about what the expected clinical change will be in response to the analytic. This has made people more judicious about their requests because now they know they will have to generate operational change."
>
> **John Pirolo, MD**, SVP & CMIO, Ascension

The Need to Redesign Care Delivery

When participants were asked to describe the effectiveness and ROI of their care plans and workflows, and how they have incorporated such results into future risk models and care-plan design, the general consensus was that it's hard to implement care plans consistently and it's hard to determine the ROI.

For some, it's difficult trying to define what the standard of care model is going to be. Outcomes for populations of people are lumped together and trying to correlate that overall population outcome with the exact care activities that took place over time is almost impossible to do. A lot of the current work is not about creating a predictive model or driving complicated analytics, but around getting clinical consensus on what the starting point will be. Healthcare systems could improve tremendously with care standards and the use of models to interpret what the outcomes will be using those standards.

Dr. John Pirolo: "We are trying to couple accountability with analytics. In the past, we treated analytics as a project, so it wasn't necessarily connected to the people who were delivering clinical care or driving clinical redesign. What we are trying to do now is pursue analytics only in response to clinical leadership direction. When the request for analytics comes in, there's a senior level discussion about what the expected clinical change will be in response to the analytic. This has made people more judicious about their requests because now they know they will have to generate operational change."

Timothy Zeddies spoke about a specific care plan at Spectrum Health: "We had some interventions that were driven by the health plan. We had a lot of unnecessary care at the end of life. We created a model to care for some people individually, very one-on-one. To do that, we had to bring in a data-scientist-type person to accurately do healthcare evaluations. We found out there's a certain kind of person who responds better to this kind of intervention."

The group acknowledged while technology and discipline are key to creating care standards, there also needs to be a sense of urgency—which is very market-specific—people need to be afraid of failure before they make the commitment to require conformance.

Lessons Learned

On the advantages and disadvantages of Hadoop: Hadoop can be used to create operational population health dashboards for a full view of the care continuum. If patients go to an external healthcare agency, that can be graphed to illustrate linkages in the system, like follow-up visits and readmissions. The data lake and the fidelity of data helps to understand unknowns. It also gives the organization a platform for a data scientist to explore, understand and bring things forward that may not have been discovered otherwise.

When considering this type of technology, a healthcare system should examine the problems it is trying to solve. Is it about improving clinical and financial outcomes? Is there a less expensive solution or one without unnecessary bells and whistles?

Hadoop can be used to reduce costs significantly and it has the benefit of primarily being a late-binding strategy that doesn't force the need to identify every single use up front. Data flows into a data lake or source mart. However, at some point, the data must be extracted and the skill level of the person required for this work should not be underestimated. There's a significant difference in the skill level required to navigate clusters, and costs become a factor when thinking about Hadoop. Consider a strategy that combines Hadoop with common tools that allow lower skill sets. This still leverages the power of Hadoop and data-lake-types of concepts without the need to hire PhDs and other data scientists, which are hard to find.

People often underestimate the cluster size required for a data warehouse. When putting in an initial cluster, the bigger the better.

Hadoop is a good environment for understanding associative relationships, but for those seeking a high degree of causality, it can be frustrating because it requires a high level of curation and cleanliness of the dataset in order to trust that causality.

On how to get your organization to be more data-driven: Mark Hohulin said, "It comes down to leadership and perhaps putting executive scorecards in place. There might be an overabundance of metrics to follow, but they give a focus for data and help develop infrastructure across the entire enterprise. Assign champions to goals and have them define metrics and definitions, take total accountability, and report about performance back to the board. They need to be business owners capable of making the changes assigned to their goal."

On the complexity of data: By itself, data is complex. Layer on top of that the business of healthcare and a multifaceted healthcare enterprise and it becomes difficult and draining work. It's advantageous to listen to the problems, frustrations and solutions of other thought leaders and realize shared commonalities.

"It comes down to leadership and perhaps putting executive scorecards in place."

Mark Hohulin, SVP, Healthcare Analytics, OSF Innovation, OSF HealthCare System

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On vendors: Participants view vendors with outright suspicion when it comes to addressing data needs under population health. Population health is still an experiment, participants said, and vendors have been overpromising and under-delivering. More advanced vendors have more comprehensive solutions, but nobody has a complete offering nor are they able to scale their offerings. In the end, it's not necessarily a question of a vendor having all the gaps filled, but whether or not they are effective at delivering their products with a full deployment methodology and capability. Data quality is also affected by EHR vendors and their primary motivation to move healthcare systems over to their way of life rather than promoting true interoperability.

Conclusion

Chief Data and Analytics Officers may be relative newcomers to the healthcare C-suite, but health systems smart enough to bring them to the senior-executive table will be the ones still standing when the dust settles on the tumultuous transition to value-based care. Because data is the lingua franca of population health, becoming a data-driven organization is imperative for a truly integrated delivery system. But the challenges of data are myriad and daunting: data quality, standards, integration, access, security, governance and management require often herculean human and technical effort. Building a data-driven culture in healthcare will demand not only system-wide discussions but industry-wide ones as well. We hope this SI Summit and report contributes to that effort.

Resources

Advocate Cerner Partnership Creates Big Data Analytics for Population Health
http://www.scottsdaleinstitute.org/docs/teleconfs/2016/2016-09-19.Advocate-Cerner.Big-Data-Analytics.Pop-Health.957mnb.pdf
Sept. 9, 2016

Lesson Learned in Data Migration at Memorial Hermann
http://www.scottsdaleinstitute.org/docs/teleconfs/2016/2016-05-19.Data-Migration.pmh463.pdf
May 19, 2016

Integrating Data Across Systems of Care
http://www.scottsdaleinstitute.org/docs/pubs/ie/IE.2016-04.Integrating-Data-Across-Systems-of-Care.32s3gw.pdf
April 2016

New Technologies Help Transform the Use of Big Data
http://www.scottsdaleinstitute.org/docs/teleconfs/2016/2016-04-12.Big-Data.383jdk2w.pdf
April 12

The Four Balancing Acts involved with Healthcare Data Security
https://www.healthcatalyst.com/knowledge-center/white-papers

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