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Pairing HIE Data with an Analytics Platform: Four Key Improvement Categories

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Healthcare organizations need data from multiple sources and multiple organizations to meet population health and value-based payment (VBP) goals. Communitywide networks, such as healthcare information exchanges (HIEs), are increasingly important in the current healthcare landscape, as they provide the interoperability modern healthcare improvement demands:

- Clinical, pharmaceutical, public health, and quality reporting data.
- Electronic sharing between different information systems (e.g., web services, transmission control protocol/internet protocol [TCP/IP], secure SMTP, DirectTrust, etc.).
- Clinical exchange in multiple formats (e.g., HL7 2.x, HL7 CDA, text, PDF, etc.).
- Cross mapping from technologies, systems, and formats.

HIE data and technology alone, however, isn't sufficient for organizations aiming to improve outcomes and lower the cost of care. This report covers the benefits of using HIE data and technology along with an advanced analytics platform and how their combined capabilities meet modern healthcare challenges.

The Case for HIE Data

Large integrated delivery networks (IDNs) that contract for value-based population models require networks of providers and services to deliver holistic care. These networks of affiliated physicians often take the form of clinically integrated networks (CINs) or accountable care organizations (ACOs). Sharing information for a given patient population is a critical factor to the success of the network. Large health systems need data from the EMRs of affiliated physicians who generally work in smaller practices. These IDNs are also commonly missing data from the full continuum of care, (e.g., skilled nursing facilities [SNFs]), which creates real problems during transitions of care. Important clinical information is distributed across different systems, making it difficult to have complete data supporting population health initiatives.

Health systems can extract, transform, and load (ETL) the data from their own EMRs, but they are unable to ETL data from their affiliate physicians' EMRs. Most often, they rely on claims data as a surrogate for the affiliate EMR data—along with the complications claims data carries (e.g., lag, subpar accuracy, etc.). HIE connections and services bring in clinical data from affiliated systems in real-time to close the gaps that occur with delayed batched claims data. Bridging community health data with health systems analytics via HIE technology brings healthcare organizations significant benefits:

More Complete Data Builds Confidence Around Risk-Based Contracting

By delivering more complete data, analytic dashboards populated with HIE data can build confidence and close the loop for clinicians taking on risk-based contracts. With a better understanding of how an organization does in performance and clinical quality measures, a health system can align its value-based contracting goals and processes to identify opportunities for improvement while there is still time to react, instead of waiting to process and evaluate claims data in weeks or months. Multiple data sources can validate and improve the accuracy of risk stratification, thanks to more comprehensive patient population information.

Supports Patient Engagement at the Most Impactful and Teachable Moments

By capturing the large amounts of health data that occur outside of the IDN or health system setting, HIE data allows clinicians to engage patients when they are most likely to benefit from an intervention. Care coordinators and navigators, who are often trusted patient advocates, leverage this data to keep patients fully informed of medical information from across the continuum of care and throughout the extended care team (including SNFs, visiting nurses, etc.).

Gives Organizations Comprehensive Patient Information for Personalized Care

With HIE connections and services, healthcare professionals and patients appropriately access and securely share a patient's medical information electronically, across the continuum of care

(e.g., primary care physicians and specialists, labs, SNFs, visiting nurses, and EDs). By combining this more complete data with analytics, health systems and clinicians can provide safer and more personalized care, thanks to comprehensive access to vital patient data. For example, emergency department staff too often perform triage without a patient's full history and conditions. A real-time HIE can quickly provide an overview of chronic conditions, medications, allergies, etc. In addition, analytics systems can leverage this insight to stratify risk and identify the most impactable areas for the care team to focus (areas with the greatest return on engagement).

An HIE impacts patients, clinicians, and health systems in several key ways:

- Reduces health-related costs by reducing medical errors and duplicate testing.
- Improves quality and safety of patient care by reducing medication and medical errors associated with incomplete data.
- Coordinates the extended care team to promote consumer education and patient engagement in their own healthcare.
- Increases efficiency by eliminating unnecessary paperwork associated with patient movement between care settings.
- Provides caregivers with clinical decision support tools for more effective care and treatment.
- Improves public health reporting and monitoring.
- Facilitates efficient deployment of emerging technology and healthcare services.
- Provides the backbone of technical infrastructure for leverage by national- and state-level public health initiatives.
- Provides interoperability among individual affiliated physicians and organizational EHRs.

Even with the above benefits, HIE data alone doesn't support comprehensive improvement under the population health or value-based demands of healthcare today. To meet these modern goals, healthcare organizations must pair these networks with a fully interoperable analytics platform. An optimal modern healthcare data approach combines HIE data with a cloud-based, interoperable analytics platform (e.g., the Health Catalyst® Data Operating System [DOS™], Figure 1, below).

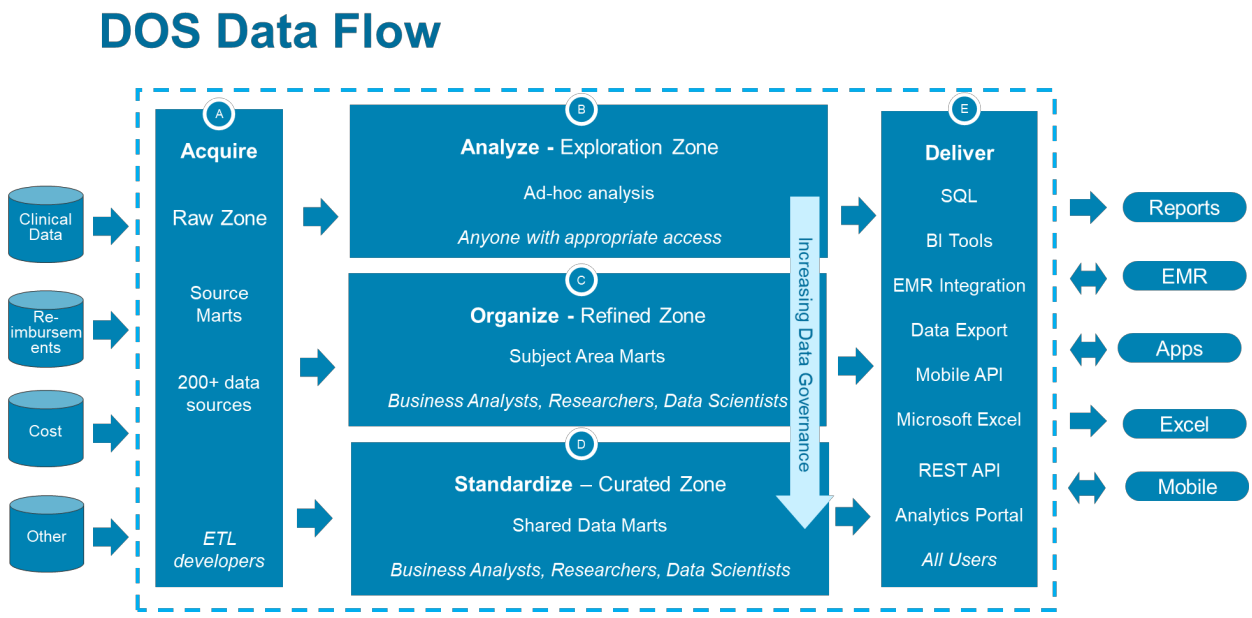

Figure 1: DOS

Four Key Improvement Categories of Pairing HIE Data with an Analytics Platform

While HIEs are rich in clinical data (e.g., records and transactions), they lack depth in the bigger picture of healthcare delivery—elements such as financial costs of care, patient satisfaction and outcomes, and supply chain data. HIE data is often limited to standard-based interfaces and datasets such as the Consolidated-Clinical Document Architecture (C-CDA) Continuity of Care Document (CCD). The CCD, however, was designed for one care provider to communicate with another about patient information (e.g., medications, allergies, and lab values) when transferring that patient from one facility to another—not for the broader goals of VBP and population health.

Using a C-CDA CCD, HIEs can meet about 80 to 90 percent of patient information sharing needs, but they're not adequate for all population health use cases. Data aggregation in an analytics platform increases the value of data overall by combining HIE with health system data (e.g., patient satisfaction, claims, and cost). For example, as an HIE lacks cost data, by combining HIE and health system resources, an analytics platform can enable community-based cost comparisons.

Pairing HIE data with DOS offers benefits in four key categories that help health systems meet goals under VBP and population health:

1. Workflow

Most healthcare analytics platform technology falls short in clinical workflows because it doesn't provide data at the points of decision-making or care. When a patient checks into a primary care

or specialist office, an analytics platform may not immediately produce critical insight at the point of care. For example, if a patient has diabetes and hasn't received a hemoglobin A1c or an eye exam, this information may not appear in front of the provider in the exam room. An interoperable analytics platform with HIE data makes insight actionable by putting the right patient information into the workflow at the right time. Information at the point of decision-making, from patient care to follow up, helps clinicians and care managers improve preventive care by addressing gaps in care and broader improvement goals.

Most HIE data is exchanged in real-time, and most analytics platforms don't support real-time action. Adding HIE technology to an organization's analytics platform delivers results within moments, directly through standard channels, sending insights (e.g., risk for sepsis and readmissions) into the provider workflow and back to the clinicians via the EMR. HIE technology makes it easier for health systems to get data into the workflow.

The right data at the point of decision making is vital to improved patient outcomes and especially to patient safety. In sepsis, for example, fast data access enables prompt diagnosis, which is critical to better outcomes. HIE also helps analytics systems incorporate medication data, such prescription and fill history, to look for complications including adverse drug events, contraindications, and opioid misuse risk.

In addition, the real-time data capabilities of HIE technology enable timely notifications across the continuum of care triggered by the health system analytics platform. Subscribed clinicians and care managers can receive a timely alert when a patient experiences a health-related event, such as a gap in care warning. An organizational analytics platform integrates with a decision-support tool, such as Health Catalyst Leading Wisely™, to provide personalized watch-lists, configurable visualizations, and customizable alerts and notifications.

2. Machine Learning

HIE increases the amount and reduces the lag of data available to analytics platforms, which provides data scientists a more robust data set with which to train machine learning models. Clinicians can more quickly identify risks and opportunities for intervention as well as predict behaviors and events across entire patient populations.

Predictive analytics can verify patient compliance with medication using prescription fill records to see which medications a clinician has prescribed versus which have been filled. As well, predictive algorithms can identify drug-seeking behavior, using statewide prescription data as well as socioeconomic data from the HIE.

3. Professional Services

Combining HIE data with health system analytics helps organizations identify top-performing clinicians for a sustainable, high-performing CIN. Choosing the right clinician will reduce

outcomes variation in clinical care and build the network around clinicians with better outcomes (both in the acute and ambulatory settings). An HIE also helps clinicians become top performers by understanding variation across large populations, especially in conjunction with a benchmarking, opportunity analysis, and prioritization analytics application (e.g., Health Catalyst Touchstone™).

Using HIE data in health system analytics also helps CIN clinicians get genuine value from healthcare technology beyond regulatory reporting. Value from enhanced decision-making tools and eased clinician reporting burden adds incentive for clinicians to join the CIN and improves provider engagement, as combining HIE and analytics reduces the labor of producing reports.

4. Data Governance

HIE environments struggle with data governance, particularly with data quality and ownership, and organizations without good data governance struggle when they introduce an HIE. A commercial analytics platform, and the vendor expertise behind it, helps organizations define and comply with regulations.

Vendors, meanwhile, also benefit from HIE around data governance. Life sciences data, for example, has strict rules around purpose of use, including patient consent and disclosure. HIE data adds patient consent expertise to these health system platforms.

Meeting Today's Payment and Population Health Goals Requires Both HIE and an Analytics Platform

To meet quality measures under VBP as well as population health goals, healthcare organizations must have the comprehensive patient and community data to power advanced analytics capabilities that only an HIE-and-analytics-platform approach can deliver. Combined, the data and analytics entities provide greater understanding of patient health across the continuum of care and move insights into the workflow at the point of decision making. With real-time communitywide and individual data, clinicians gain a broader context for the patient, allowing more timely, informed, and accurate decisions. This allows for better care and outcomes and builds trust among health systems in taking on risk-based contracts and population health models.