Improving Data Interoperability and Integration to Support Value-Based Care: Lessons from Stakeholder Interviews

Fred Blavin
Principal Researcher, The Urban Institute

Gary Ozanich
Senior Consultant, HealthTech Solutions

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Laura Young
Interoperability Consultant

Gail Kocher, MPA
Director, National Standards,
Blue Cross Blue Shield Association

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Learning Outcomes

1. Classify the factors that differentiate higher and lower levels of data integration

2. Describe the use cases and activities associated with data integration to support value-base care

3. Evaluate barriers to and facilitators of data integration through a Technical, Organizational and Environmental Factor framework (adapted from DePietro, Wiarda, and Fleischer 1990)

4. Discuss policy and organizational interventions that could further promote data integration.

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What is the Difference between Interoperability and Data Integration?

- Interoperability: The ability to receive, find, and integrate data from outside sources

- Data Integration can be considered the last step of interoperability
  - Shared data reach the intended recipient
  - Data is in a usable format

Data Integration: Differences Between Types of Provider Organizations
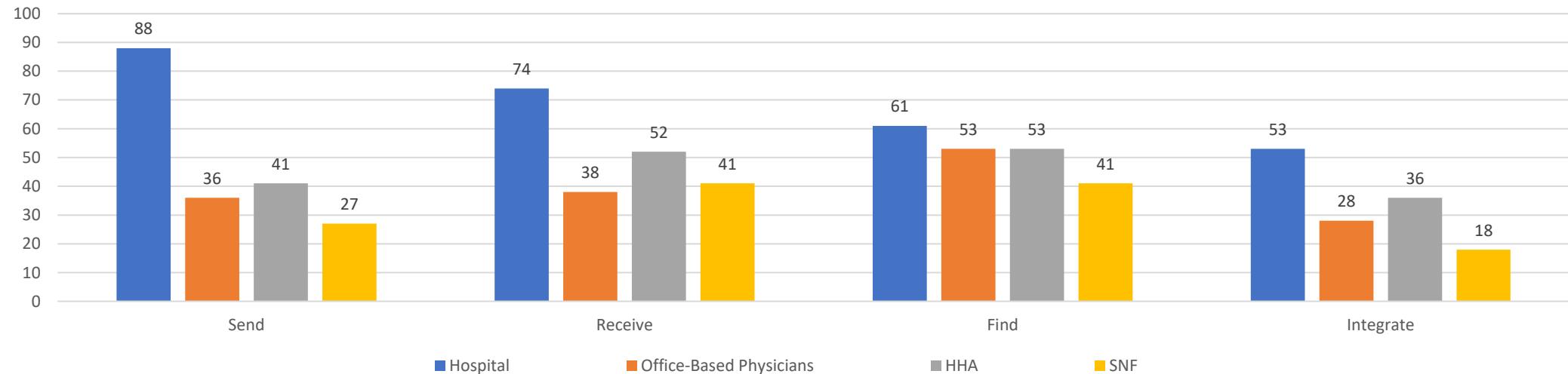
Synthesized from ONC Data Briefs 41, 42, and 47 based on data presented from:
Hospitals: 2017 AHA Annual Survey Information Technology Supplement;
Office-based physicians: 2017 National Electronic Health Record Survey; and
Home Health Agencies (HHA) and Skilled Nursing Facilities (SNF): 2017 IQVIA Nursing Home and Home Health Agency Census

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This Suggests Two Questions:

- In what situations and locations is data integration occurring at the most advanced level?

- What lessons can be learned from organizations involved in those situations?

Value-Based Care and the Utility of Data Exchange

- Providers are financially rewarded or penalized based on quality of care provided

- Quality of care is typically measured in outcomes

- VBC usually involves shared risk or shared savings arrangements between payers and providers

- To achieve the goals of VBC, organizations need to effectively share and integrate patient data from multiple sources

  - This includes data from all sources, including those outside the VBC arrangement

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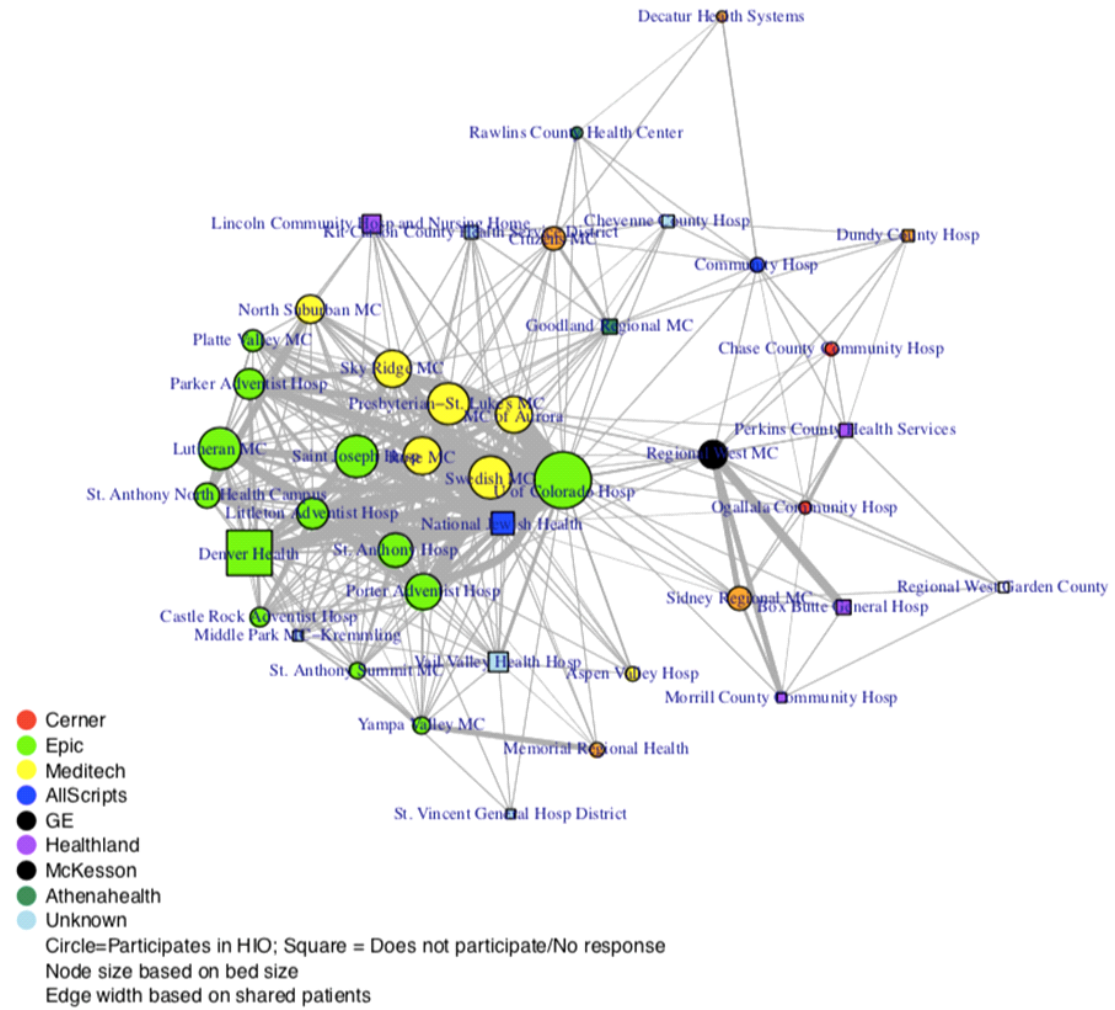# *Case Study: Research Questions*

What Lessons Can Be Learned from Advanced Uses of Data Integration in VBC?

1. What does data integration currently look like in practice?

2. What are the uses of data integration to support value-based care?

3. What are the barriers to and facilitators of data integration?

Methodology

- Technical Expert Panel (TEP)

    - Consisted of 7 individuals identified with input from ASPE and ONC

    - Developed a framework for understanding barriers to and facilitators of data integration

- Literature review and research brief (2020) contextualizing data integration

- Applied TEP and research brief findings to this case study analysis

    - Qualitative thematic analysis of semi-structured interviews

Case Study Locations: Network Analysis of Trading Partners

- Cerner
- Epic
- Meditech
- AllScripts
- GE
- Healthland
- McKesson
- Athenahealth
- Unknown

Circle=Participates in HIO; Square = Does not participate/No response
Node size based on bed size
Edge width based on shared patients

Characteristics of Proposed Case Study Locations

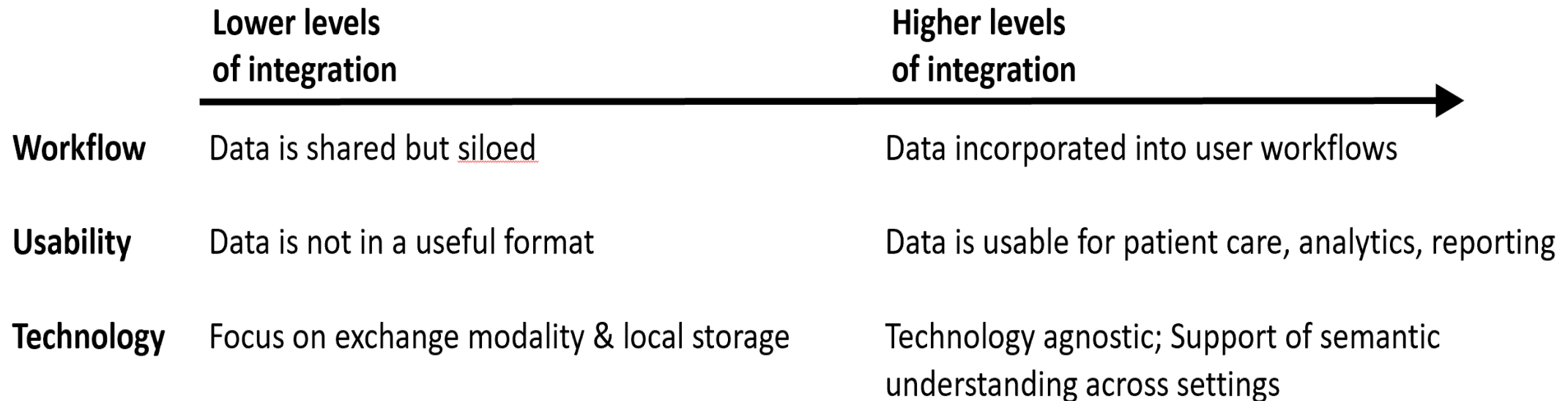| HRR	Integrating data (%)	State VBC maturity	CMMI ACO	Includes some rural	Primary hospital vendor (%)	Primary physician vendor (%)
Orange County, CA	Hosp: 42%, SNF: 40%	Medium	✓		Epic (38%)	Allscripts (13%)
Denver, CO	Hosp: 48%, SNF: 21%	Medium		✓	Meditech (25%)	Epic (16%)
Manhattan, NY	Hosp: 40%, SNF: 33%	High	✓		Allscripts (30%)	Epic (13%)
Erie, PA	Hosp: 44%, SNF: 29%	High		✓	Meditech (40%)	Epic (14%)
Minneapolis, MN	Hosp: 52%, SNF: 11%	Medium	✓	✓	Epic (70%)	Epic (39%)
Portland, OR	Hosp: 80%, SNF: 33%	Medium	✓	✓	Epic (76%)	Cerner (27%)
Salt Lake City, UT	Hosp: 70%, SNF: 7%	Low	✓	✓	Cerner (48%)	Epic (28%)
Indianapolis, IN	Hosp: 26%, SNF: 41%	Low	✓	✓	Meditech (29%)	Cerner (54%)
Baltimore, MD	Hosp: 23%, SNF: 5%	Medium	✓	✓	Epic (55%)	Epic (23%)
Ann Arbor, MI	Hosp: 80% SNF: 0%	Medium		✓	Epic (60%)	Epic (62%)
Manchester, NH	Hosp: 18% SNF: 40%	Medium	✓	✓	Meditech (27%)	GE (23%)

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Interviewee Organizations

- Total of 21 organizations

- Research activities complicated by COVID-19 (interviews began in June 2020)

- Changes made to original 6 sites identified
  - Merger between HIEs: One site dropped
  - Expanded to additional locations which met criteria

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Final Interviewee Location and Organization Type

Characteristics	Number of interviewee organizations
Location	
Colorado	5
Georgia	1
Indiana	2
Maryland/DC	3
Michigan	7
New York	1
North Dakota	2
Organization type	
HIE	8
Hospital or health system	6
Ambulatory provider	6
Long-term, post-acute care	1

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Framework: Levels of Data Integration

	Lower levels of integration	**Higher levels of integration**
Workflow	Data is shared but siloed	Data incorporated into user workflows
Usability	Data is not in a useful format	Data is usable for patient care, analytics, reporting
Technology	Focus on exchange modality & local storage	Technology agnostic; Support of semantic understanding across settings

Source: Ozanich and Ramos 2020

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Findings

What is Data Integration?

- Data integration is typically defined as the mechanism for transforming and integrating data from multiple sources into a target destination environment

- In practice, the definition is highly contextual and varies within and across organizations

  - Some organizations simply view data integration as the use of data from outside organizations

  - Others view it as the creation of a single record from of patient data from multiple organizations in a standard format

Levels of Data Integration

- Data integration should not be viewed as occurring or not occurring

- Higher levels of integration are not necessarily required or necessary
  - Workflow may be effectively supported by lower levels of integration
  - Trade-off between costs, technical functionality and workflow evolves over time

- There were few examples of data from outside organizations being parsed into a record
  - Viewed rather than incorporated into a local instance (even within a vendor network)

- Technology was viewed as less important than workflow or usability

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Data Integration to Support Value-Based Care

- Four principal use cases:
  - Point of care encounters

  - Care coordination

  - Quality measurement and reporting

  - Population health

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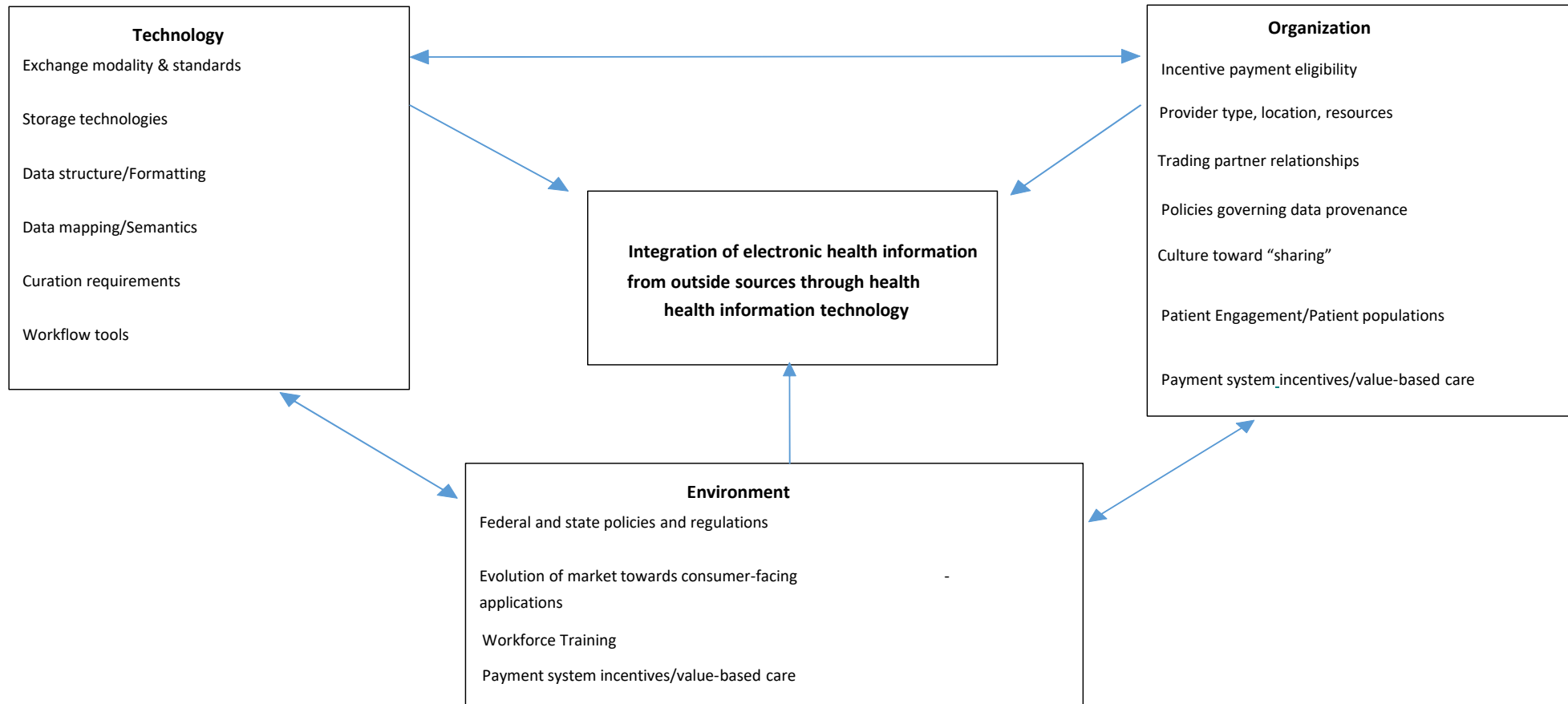# *Levels of Integration Required by Use Case*

- **Point of care and care coordination**
  - Required lower levels integration
  - Limited number of high value data elements used (not a comprehensive data set)
  - Viewing information is part of an established workflow (need for limited integration)
  - Data provenance is important (originating organization, date)
- **Quality Measurement and Reporting**
  - Data sourced from broad range of providers perceived as leading to better "scores"
  - Data curation, standardization and integration require time, cost, and sophistication
  - Currently achievable for target populations and key datasets

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Levels of Integration Required by Use Case, Cont'd

- **Population Health Management**

  - Requires high levels of data integration, similar to quality measurement and reporting

  - Value-added uses of the data such as predictive analytics

  - Additional uses: promote public health and identify gaps in care and health disparities

  - Much of the data is unstructured (e.g., social determinants of health)

  - Level of data integration is at a much higher level than that needed to support day-to-day clinical activities (as currently practiced)

Barriers and Facilitators of Data Integration

Technology

Exchange modality & standards

Storage technologies

Data structure/Formatting

Data mapping/Semantics

Curation requirements

Workflow tools

Integration of electronic health information from outside sources through health health information technology

Organization

Incentive payment eligibility

Provider type, location, resources

Trading partner relationships

Policies governing data provenance

Culture toward "sharing"

Patient Engagement/Patient populations

Payment system incentives/value-based care

Environment

Federal and state policies and regulations

Evolution of market towards consumer-facing   -
applications

Workforce Training

Payment system incentives/value-based care

Technical Factors and Data Integration

- EHR vendor selection and capability
  - Providers with the same vendor more likely to share records
  - Some providers viewed as being "trapped" with bad technology

- Challenges of Continuity of Care Documents

- HIEs exhibit knowledge of new solutions including FHIR and USCDI

- Provider organizations have limited knowledge of new solutions

- Significant personnel, time, and effort required to standardize data particularly for advanced use cases

- Workflow issues such as single sign-on, PDMP integration, provider support

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Organizational Factors and Data Integration

- Facilitators
  - Availability of financial resources required to support data integration and competing organizational priorities
  - Need for greater payment incentives for data-sharing even with VBC models
  - Trust between payer and provider organizations
  - Organizational culture that supports "sharing and trust"

- Barriers
  - Lack of above facilitators
  - Liability issues from outside data, breaches at trading partner systems, can patient privacy

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Environmental Factors and Data Integration

- Federal policies such as MIPs have incentivized stakeholders toward data integration to support quality reporting and complement other VBC initiatives

- Many EHR vendors have been slow to support modifications needed to support reporting functionality with the result that such work is customized, local, and one-off.

- State and federal programs require different data, measures, and reporting periods, leading to inefficiencies and barriers to integration

- Payer support and use of HIEs facilitate data integration and provide a vested interest in the scope and types of data integration across all stakeholders

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Conclusion

- Data integration is not binary
  - Conceptualize as a continuum
  - Many use cases do not require the highest levels of integration

- Higher levels of integration are not necessarily required for point-of-care use but are important to support population health management and quality measurement

- Many of the challenges of data integration could be addressed by new standards and policies
  - Policies directed by Cures Act e.g., USCDI, FHIR-based applications, information blocking rules, and the EHR Reporting Program
  - Payment reform to incentivize data sharing and use of shared data
  - Solutions addressing health equity and disparities

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