

REPORT
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Healthcare and Interoperability – Industry-Wide Perspectives



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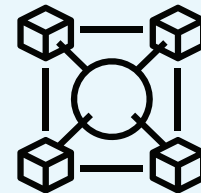


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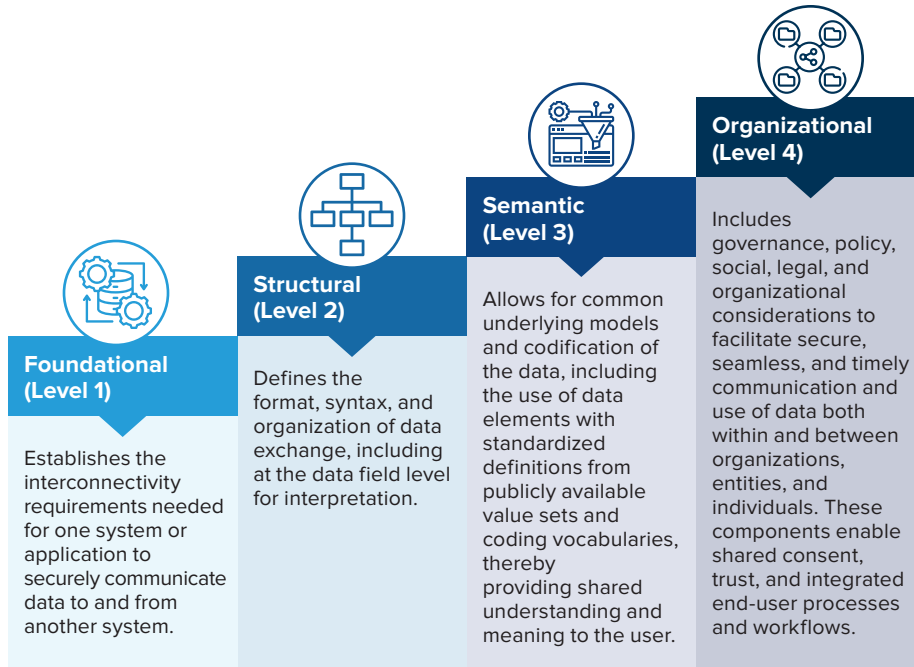


Interoperability, or the ability of different systems to communicate and exchange data seamlessly, is a fundamental requirement for any industry to use data as effectively as possible. In the healthcare and life sciences sector, interoperability is a complex challenge that has the potential to greatly improve the quality of patient care, while also reducing costs and increasing efficiency.¹

However, achieving interoperability in healthcare continues to be fraught with challenges. The industry has been wrestling with data sharing issues for decades.² But data sharing is not the same as interoperability. Simply sharing data between different systems or departments does not necessarily mean that the data is easily available or accessible by all systems. Interoperability is different in that it requires a standardized and structured way of exchanging information between systems, removing data silos, to make data usable and actionable for all stakeholders.



DEFINING INTEROPERABILITY IN HEALTHCARE WITH HELP FROM HIMSS



Source: [HIMSS](#)

Each stakeholder has different requirements for interoperability, increasing the complexity and challenges for healthcare organizations as they strive to meet the needs of each stakeholder.

For example, clinicians may need to access patient data from multiple sources to provide optimal care. They require access to real-time information that is not only accurate but also up-to-date. Payers, on the other hand, may need patient data to ensure that the care provided is medically necessary and is being reimbursed appropriately. Meanwhile, regulators need data to monitor the quality of care delivered by healthcare providers and ensure regulatory compliance.

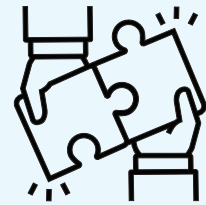
Interoperability is different in that it requires a standardized and structured way of exchanging information between systems, removing data silos, to make data usable and actionable for all stakeholders.

The healthcare industry has recognized the importance of interoperability and is taking steps to address the challenge. But despite some progress, many obstacles remain, such as the need to reconcile data from multiple sources, standardize data formats, and ensure data security and privacy. Solutions will require collaboration between stakeholders in the healthcare industry and a commitment to addressing the issues at hand.

Capturing Views Across the Industry

To better understand the state of interoperability today, Snowflake partnered with Fierce Healthcare to survey a segment of healthcare providers, systems, regulators, and payers to ask about present-day challenges associated with interoperability. The survey revealed interesting insights, especially when comparing differences by job title, organization type, and role within the organization.

In this report, we explore where they see their interoperability strategy as being least effective, what challenges they think interoperability will address, and their perspectives on how it impacts care quality.



Solutions will require collaboration between stakeholders in the healthcare industry and a commitment to addressing the issues at hand.

SUMMARY OF FINDINGS

**Finding
1**

Interoperability efforts are most focused on improving patient care and coordination.

**Finding
2**

Organizations are challenged by technical limitations, especially in decision-making.

**Finding
3**

Most organizations expect interoperability efforts to improve patient outcomes.

**Finding
4**

Most organizations are taking steps towards interoperability.

**Finding
5**

Interoperability strategy fails to effectively address three key areas.

Methodology

This online survey was conducted by Questex/Fierce Healthcare in late 2022. The results are based on 145 completed surveys with respondents from a sample drawn from Questex databases. Nine out of ten participants (90%) live in the United States. Other countries where participants live include Brazil, Canada, Colombia, Georgia, Germany, India, Indonesia, Kenya, Lebanon, Pakistan, Portugal, the Republic of Korea, and the United Kingdom.

Job Titles

Survey participants have a wide range of job titles and responsibilities. Titles were aggregated into three groups to ensure enough participants for analysis across the following groups:

- **Executives:** C-suite, all VP levels, and director level (56 participants or 39%)
- **Managers:** Manager level, associates, analysts, and assistants (53 participants or 36%)
- **Other titles:** Physicians, nurses, regulators, therapists, pharmacists, professors, consultants, and others (36 participants or 25%). This group is most heavily weighted toward clinicians (86%)

Organization Type

The data set was also analyzed by three types of organizations. Organizations were aggregated into the following three groups to ensure enough participants for analysis across groups:

- **Healthcare Providers** (61 participants or 42%)
- **Healthcare Systems/Independents** (59 participants or 41%)
- **Payers/Agencies:** Insurers/payers and public health agencies (25 participants or 17%)

Role Type

Finally, the data set was analyzed by roles within organizations. These roles were aggregated into the following three groups to ensure enough participants for analysis across groups:

- **Administrators** (61 participants or 42%)
- **Clinicians** (56 participants or 39%)
- **Other roles:** IT, regulatory, informatics (28 participants or 19%)

Throughout the report, specific survey answer phrases are noted in italics. These phrases, such as, *improving patient care* and *coordination*, refer to how a response option was phrased in the original survey.



“With staff shortages, higher scrutiny around reimbursements, and medicine supply chain challenges—effective, timely decision-making about patient care has never been more important. It’s critical to have easy access to real-time data and analytics to do this right.”

— Jesse Cugliotta,
Global Industry GTM Lead -
Healthcare and Life Sciences,
Snowflake

Interoperability Efforts

Finding 1: Interoperability efforts are mostly focused on improving patient care and coordination.

A little more than half of all survey respondents (52%) rank improving patient care and coordination as the #1 outcome they are currently most focused on in regard to improving interoperability. Of all respondents, other outcomes rated #1 in terms of what organizations are currently most focused on in regard to improving interoperability include the following:

- Optimizing workflows and informing decision-making via analytics (e.g., clinical/business) (14%)
- Ensuring regulatory compliance (12%)
- Enabling new care models (7%)

FINDING 1: DEMOGRAPHIC BREAKDOWN

JOB TITLE	ORGANIZATION TYPE	ROLE
<ul style="list-style-type: none"> • Three out of four other titles (75%) (heavily weighted toward clinicians) rank <i>improving patient care and coordination</i> the #1 outcome in regard to improving interoperability. • This is also the #1 ranked outcome for executives and managers, but at much lower levels—41% for executives and 47% for managers. 	<ul style="list-style-type: none"> • Providers (66%) rank <i>improving patient care #1</i> more often than systems (44%) and payers/agencies (36%). • Compared to providers and systems, a much smaller percentage of payers/agencies rank <i>optimizing workflows and informing decisions</i> as the #1 priority. 	<ul style="list-style-type: none"> • Clinicians (71%) are more likely than administrators (39%) and other roles (39%) to rank <i>improving patient care and coordination</i> the #1 outcome in regard to improving interoperability.

The way each line of business interacts with technology is unique, leading to a variety of experiences and opinions in how people view interoperability. This plays out in the data; providers and systems, more than agencies and payers, rank optimizing workflows and informing decisions first, while providers more often rank improving patient care higher than systems and agencies and payers. However, these goals are connected through interoperability; the ability to make better decisions faster will benefit everyone throughout the healthcare ecosystem.



“Our role in the transformation of healthcare is to leverage digital-first, data-driven insights to serve our members at their time of need.”

— Ashok Chennuru, Chief Data and Analytics Officer, Anthem

Organizational Challenges

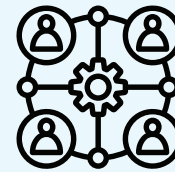
Finding 2: Organizations are challenged by technical limitations, especially in decision-making.

Two out of three survey respondents (68%) say that technical limitations are challenging or extremely challenging when obtaining data for decision-making. But technical limitations are not the only problems. Other factors seen as challenging or extremely challenging include:

- Regulatory challenges (55%)
- Time delays (stale data) (55%)
- Organizational/cultural constraints (44%)

FINDING 2: DEMOGRAPHIC BREAKDOWN

JOB TITLE	ORGANIZATION TYPE	ROLE
<ul style="list-style-type: none"> • Executives (77%), more often than managers (60%) or other titles (64%), say that <i>technical limitations</i> are the most challenging factor for organizations when obtaining data for decision-making. • <i>Time delays (stale data)</i> are seen as more of an issue for executives (59%) and managers (55%) than for other titles (49%). • <i>Organizational/cultural constraints</i> are seen as more of an issue for executives (52%) and other titles (44%) than for managers (34%). 	<ul style="list-style-type: none"> • Payers/agencies (76%), more often than providers (62%) and systems (69%), are more likely to say that <i>technical limitations</i> are the most challenging factor for organizations when obtaining data for decision-making. • Systems (64%) and payers/agencies (60%), more often than providers (43%), say that <i>time delays (stale data)</i> are a challenging factor when obtaining data for decision-making. • Likewise, systems (52%) and payers/agencies (56%), more often than providers (30%), say that <i>organizational/cultural constraints</i> are a challenging factor when obtaining data for decision-making. 	<ul style="list-style-type: none"> • Other roles (79%), more often than administrators (62%) and clinicians (68%), say that <i>technical limitations</i> are the most challenging factor for organizations when obtaining data for decision-making. • Other roles (61%), more often than administrators (44%) and clinicians (53%), say that <i>time delays (stale data)</i> are the most challenging factor for organizations when obtaining data for decision-making. • Other roles (61%), more often than administrators (38%) and clinicians (41%), say that <i>organizational/cultural constraints</i> are the most challenging factor for organizations when obtaining data for decision-making.



“Integral to powering better patient outcomes and decision-making—across the entire healthcare organization—is interoperability. Without it, the advanced analytics required to unlock new opportunities and innovations is impossible.”

— Avinob Roy, VP & GM Global Information Management Offerings, IQVIA

Common Technical Limitations in Healthcare Interoperability

- Incompatible data formats and lack of data standardization
- Difficulty combining clinical data with claims data
- Infrastructure and software systems limit data sharing
- Data and security privacy concerns and regulations

Legacy and on-premises technology are substantial contributors to interoperability challenges. It's difficult and expensive to scale, costing healthcare organizations precious money and time. These technologies make it difficult to break down data silos and are often not as agile as modern, cloud-based platforms. As a result, it is difficult for healthcare organizations to share, aggregate, and analyze data fast enough to most effectively impact patient, clinical, and business outcomes. Additionally, the wide variety of software systems (EHRs, financial software, etc.) used across the healthcare ecosystem often don't talk to one another, compounding the challenge. Healthcare organizations can benefit from cloud-based platforms and solutions that provide the flexibility, security, and scalability needed for effective data sharing and collaboration.

“We've been on a decades-long journey building the plumbing of healthcare interoperability to varying degrees of success. The next phase must allow us to collaborate on a depth of data that will not 'fit' through a FHIR API. That requires a rethink. How do we collaborate without copying data through an API?”

— Todd Crosslin, Global Industry Principal Healthcare and Life Sciences, Snowflake

Interoperability Expectations

Finding 3: Most organizations expect interoperability efforts to improve patient outcomes.

Almost two out of three survey respondents (65%) report that, as their organizations continue to execute against their interoperability efforts, they will be significantly or moderately impacting patient health outcomes:

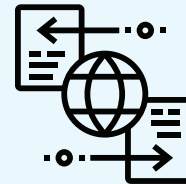
- 18% say significantly impacting
- 47% say moderately impacting

The remaining 35% of all survey respondents say their organizations' interoperability efforts will be minimally impacting or not impacting patient health outcomes:

- 26% say minimally impacting
- 9% say not impacting

FINDING 3: DEMOGRAPHIC BREAKDOWN

JOB TITLE	ORGANIZATION TYPE	ROLE
<ul style="list-style-type: none"> • Executives (75%), more than managers (55%) and other titles (64%), expect that, as they continue to execute against their interoperability efforts, they will significantly or moderately <i>impact patient health outcomes</i>. 	<ul style="list-style-type: none"> • Systems (68%) and payers/agencies (76%), more often than providers (57%), expect that, as they continue to execute against their interoperability efforts, they will significantly or moderately <i>impact patient health outcomes</i>. 	<p>No significant findings were identified by survey respondent role.</p>



“The future of health relies on radically interoperable data to power outcome-based and consumer-driven care. Essential to this is the ability of different systems to effectively and efficiently communicate and exchange data seamlessly.”

— Kumar Chebrolu, Health Care Data & Artificial Intelligence - Applied AI/Insights & Experience Practice Leader, Deloitte

Healthcare professionals' view of the role and importance of data in impacting patient outcomes has shifted over the years. The results of this survey indicate that the industry may be near a tipping point where the majority of the stakeholders in the ecosystem are realizing the value of more timely patient and clinical data—data that can be quickly and easily brought together for improved analysis and decision-making.

The recent COVID-19 pandemic forced interoperability into the spotlight. The industry had to completely transform almost instantly, shifting patient care and business processes to data-driven online platforms. The importance of building a strong healthcare infrastructure and investing in technology that powers data sharing and collaboration for public health was brought home to countries around the world.

“To accelerate our ability to understand and respond to the COVID-19 pandemic, we needed a platform that is agile, scalable, and high-performing. We also needed to give researchers the ability to securely and seamlessly share data.”

— Travis May, CEO of Datavant

Interoperability Activity

Finding 4: Most organizations are taking steps toward interoperability.

As interoperability becomes more mainstream, organizations approach it in a variety of ways. More than half of all survey respondents report they are addressing barriers to interoperability by improving data quality (54%) and migrating to a single, integrated electronic health records (EHRs) system (53%). Other actions addressing barriers to interoperability include:

- Working with interoperability technology partners (37%)
- Investing in data literacy among staff (upskilling, hiring) (36%)
- Adopting healthcare exchange standards (e.g., HL7 FHIR, DICOM, IHE XDS) (32%)
- Utilizing health information exchanges (30%)
- Investing in self-service tools and advanced analytics (AI/ML, NLP) (28%)
- Driving a unified data governance strategy (20%)

Nine percent say their organizations are not currently addressing interoperability barriers.

FINDING 4: DEMOGRAPHIC BREAKDOWN

JOB TITLE

The main actions organizations are taking to address barriers to interoperability vary by title:

- | | | |
|---|--|---|
| <ul style="list-style-type: none">• <i>Improving data quality:</i><ul style="list-style-type: none">- Executives (55%)- Managers (57%)- Other titles (44%) | <ul style="list-style-type: none">• <i>Investing in self-service tools and advanced analytics:</i><ul style="list-style-type: none">- Executives (32%)- Managers (36%)- Other titles (11%) | <ul style="list-style-type: none">• <i>Driving a unified data governance strategy:</i><ul style="list-style-type: none">- Executives (25%)- Managers (26%)- Other titles (0%) |
| <ul style="list-style-type: none">• <i>Working with interoperability technology partners:</i><ul style="list-style-type: none">- Executives (48%)- Managers (38%)- Other titles (22%) | <ul style="list-style-type: none">• <i>Adopting healthcare exchange standards:</i><ul style="list-style-type: none">- Executives (39%)- Managers (30%)- Other titles (19%) | <ul style="list-style-type: none">• <i>Migrating to a single EHRs system:</i><ul style="list-style-type: none">- Executives (59%)- Managers (45%)- Other titles (58%) |
| | | <ul style="list-style-type: none">• <i>Utilizing health information exchanges:</i><ul style="list-style-type: none">- Executives (36%)- Managers (28%)- Other titles (25%) |

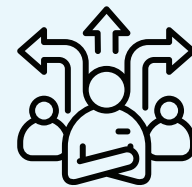
FINDING 4: DEMOGRAPHIC BREAKDOWN (CONTINUED)

ORGANIZATION TYPE	ROLE
<ul style="list-style-type: none"> Systems (58%) and payers/agencies (60%), more often than providers (46%), say that they are <i>improving data quality</i> to address barriers to interoperability. 	<p>No significant findings were identified by survey respondent role.</p>
<ul style="list-style-type: none"> Payers/agencies (48%), more often than providers (21%) and systems (27%), say they are <i>investing in self-service tools and advanced analytics</i> to address barriers to interoperability. 	
<ul style="list-style-type: none"> Payers/agencies (44%), more often than providers (11%) and systems (17%), say they are driving a <i>unified data governance strategy</i> to address barriers to interoperability. 	

The data shows that most organizations are taking steps toward interoperability. However, priorities for and paths to interoperability shift by job title and organization type, as well as the challenges for each of them. Likewise, different healthcare organizations have different levels of interoperability maturity. As the need to improve communication and data sharing between stakeholders continues to rise due to government regulations and the increased focus on patient outcomes, organizations will need to support those relationships more strategically, with more help and data sharing technology in place.

Given the state of the industry, healthcare stakeholders are also under significant and rising pressure to make good decisions quickly. To overcome these challenges and drive interoperability efforts, most survey respondents are focusing on data quality and using a single electronic health record (EHR).

These are important first steps, but they are not enough. These steps do not address the wider data sharing issue with external agencies and partners. EHRs are designed to encounter documentation systems, and therefore can never be the single platform that captures all patient interactions and needs. It must be deployed along with an external partner to provide a full picture.



Given the state of the industry, healthcare stakeholders are also under significant and rising pressure to make good decisions quickly.

Interoperability Improvement Gaps

Finding 5: Interoperability strategy fails to effectively address three key areas.

Three areas in which survey respondents indicated their organization’s interoperability strategy did not very effectively or effectively address business needs include:

- Facilitating the development of patient-facing applications (48%)
- Enabling the management and usage of unstructured data (e.g., medical images, clinical notes) (45%)
- Improving supply chain planning accuracy (35%)

FINDING 5: DEMOGRAPHIC BREAKDOWN

JOB TITLE	ORGANIZATION TYPE	ROLE
<ul style="list-style-type: none"> • Other titles (25%) are less likely than executives (36%) and managers (42%) to say that the business need that organizations’ interoperability strategy is very effectively or effectively addressing is <i>improving supply chain planning accuracy</i>. 	<ul style="list-style-type: none"> • Providers (56%) and systems (55%) are less likely than payers/agencies (68%) to say that <i>enabling timely, accurate reporting and streamlining operational efficiencies</i> is the business need that their interoperability strategy is most effectively addressing. 	<ul style="list-style-type: none"> • Clinicians (36%) and other roles (43%) are less likely than administrators (62%) to say their organizations’ interoperability strategy is very effectively or effectively addressing <i>facilitating the development of patient-facing applications</i>. • Clinicians (41%) and other roles (24%) are less likely than administrators (59%) to say their organizations’ interoperability strategy is very effectively or effectively addressing <i>enabling the management and usage of unstructured data</i>. • Clinicians (32%) and other roles (21%) are less likely than administrators (44%) to say their organizations’ interoperability strategy is very effectively or effectively addressing <i>improving supply chain planning accuracy</i>.

Providers and clinicians are under immense financial and regulatory pressure to improve the patient experience, care delivery, and patient outcomes. Integral to each of these objectives is the effective use of data of all types, including structured, unstructured, and semi-structured (names, medical images, emails, etc.). Healthcare organizations that can bring all these types of data together and collaborate on them through an effective interoperability strategy can more easily develop patient-facing applications to enhance patient care and efficiently monitor the healthcare supply chain, ensuring patients receive the medicines and supplies they need.

Conclusion

Despite its challenges, the potential positive outcomes of interoperability for the industry make it worthwhile to pursue. Data sharing alone is not enough to achieve interoperability. Healthcare organizations need secure and flexible technology solutions to enable it across the ecosystem, as well as an organizational culture that supports its many complexities.

Every stakeholder can benefit from improved patient outcomes, reduced costs, increased efficiency, improved decision-making, and regulatory compliance—and that’s why every stakeholder must be involved in creating a standardized and structured way of exchanging information between systems.



Organizations use Snowflake’s Data Cloud to unite siloed data, discover and securely share data, and execute diverse analytic workloads across multiple clouds and geographies. Organizations, including 573 of the 2022 Forbes Global 2000 as of January 31, 2023, use the Snowflake Data Cloud to power their businesses. Learn more: snowflake.com

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