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Survey

2023 NATIONAL TRENDS REPORT

Digital Health Most Wired: 2023 National Trends Report

The annual CHIME Digital Health Most Wired (DHMW) survey program offers essential insights into how healthcare organizations (HCOs) worldwide are using healthcare information technologies (HIT) and practices. Widely known for the annual Digital Health Most Wired recognition awards, the DHMW survey program aims to support healthcare leaders' decision-making by providing robust benchmarking and trending profiles of digital health usage in HCOs, all the while encouraging HIT adoption via DHMW Level designations.

Reflecting the digital profiles of approximately 40% of US hospitals, the varied array of HCOs included in the 2023 DHMW survey is highly representative of the known US health system landscape. As such, the survey serves as a valued resource in identifying major themes and shifts in the digital health marketplace. This year's survey is no exception as the overarching theme of the 2023 DHMW survey findings can be characterized as “**accelerating data usage**.”

In a digital health world shaped by Meaningful Use, the focus of HCOs has largely shifted from data capture and storage capabilities to improving outcomes. In this environment, leveraging data emerges as a critical activity in the realization of improved operational and clinical outcomes. While the acceleration of data usage was evident in all eight sections of the survey, it tends to be the outcome shaped by three overarching forces manifest in varied ways throughout the survey:

1. Enhanced data outputs
2. Expanded data inputs
3. Elevated data direction

In this report, we present evidence from the 2023 DHMW survey supporting the acceleration of data usage, interspersed with supplementary findings from KLAS Research. To better appreciate how and why the acceleration of data usage percolated as a driving force in this year's survey, we begin by considering the market context within which the survey was conducted.

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CHIME would like to acknowledge and thank KLAS Research for their collaborative input on this year's National Trends Report.



The Industry’s Post-Pandemic Recovery Progress and Digital Health

Before the recent pandemic, HCOs had made substantial investments in technology to comply with regulatory requirements such as Meaningful Use, with the ultimate goal of leveraging data to enhance clinical quality and outcomes. Concurrently, they began deploying technology to support value-based care initiatives, which prioritized clinical quality and patient outcomes while also targeting cost reduction.

The pandemic prompted a reset in technology priorities. Initially driven by the adoption of telehealth to meet COVID-related demands, organizations rapidly shifted their technology focus to an array of remote technologies to support operational efficiencies, cost reductions, and revenue-boosting initiatives (e.g., work from home capabilities, operational command centers, and telesitting). For organizations pursuing these efforts, IT spending became a necessity, prompting many to increase their IT budgets even in the face of staff and revenue contractions.

In the wake of the pandemic, financial and staffing challenges persist, raising questions about healthcare’s new normal.

Stabilizing IT Budgets

Evidence from the 2023 DHMW survey suggests IT budgets during the annual survey lookback period (April 1–March 31) have stabilized post-pandemic, with much of the market poised to maintain pre-pandemic expenditure levels (Figure 1).

Recent interviews by KLAS Research with approximately 300 HCOs across diverse settings and sizes support this claim. KLAS findings reveal most interviewees plan to increase their HIT spend over the next one or two years as technology remains a critical component of their strategy to address labor shortages, wage inflation, and reduced margins. Still under enormous financial pressures, IT leaders are weighing their options carefully and looking to adopt solutions that have clear, measurable ROIs. These indicators collectively suggest a trajectory of slow yet steady progress and adaptation in the healthcare industry.

Continued IT Staffing Challenges

Historical DHMW data indicates that staffing levels remain a formidable challenge for HCOs as organizations continue to grapple with low IT staffing levels in a post-pandemic world (Figure 2).

Overall, most leaders in the previously cited KLAS study expect wage inflation and labor shortages to continue to impact their technology budgets, with many reporting these factors have already caused expenses to increase compared to the previous six months. Beyond the evident gaps in clinician availability, challenges extend to administrative personnel, back-office staff, and IT professionals.

Figure 1

IT Expense as a Percent of Total Revenue (2019–2023)

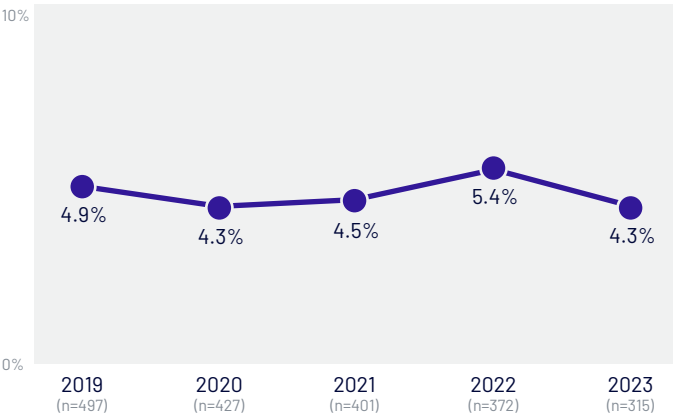
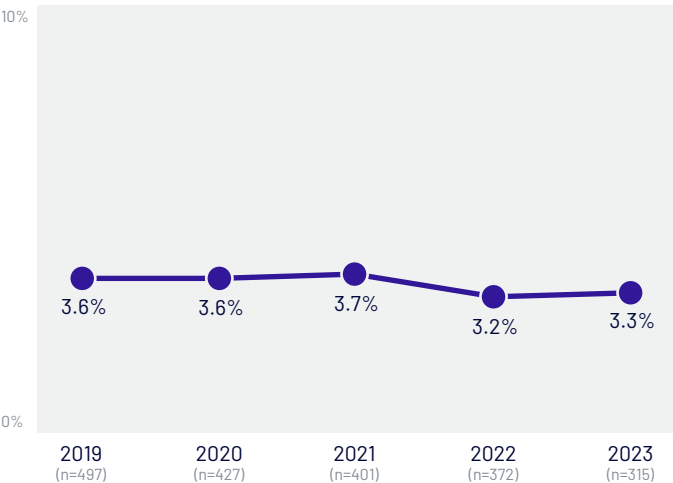


Figure 2

IT Staff as a Percent of All Staff (2019–2023)



In response, organizations are increasingly turning to technology to mitigate staffing dependencies, citing its potential to automate tasks or ensure efficient utilization of staff through predictive analytics models. Some of the software solutions expected to alleviate staffing challenges include tools for patient self-scheduling, IT task automation (e.g., ticketing), scheduling, revenue cycle automation, ambient speech, release of information, remote patient monitoring and EHR optimization and automation.

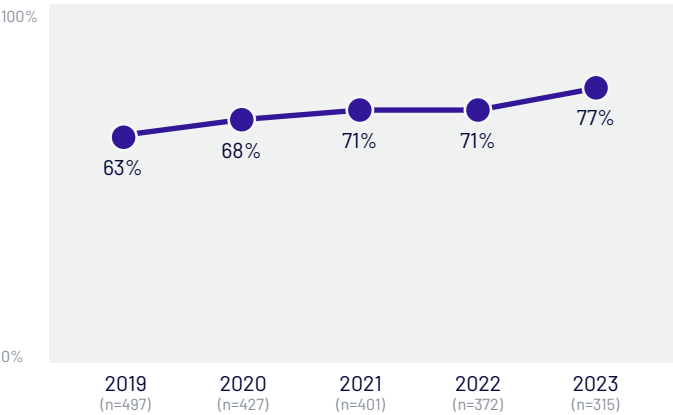
Embracing Digital Health Capabilities & Data Usage

Striking a delicate balance between financial stability and allocating resources for IT support has become a critical concern. Consequently, many organizations are placing a heightened emphasis on leveraging tools to identify areas of excessive spend, optimize staff utilization and adopt a data-driven approach to strategically decide where to invest.

Given this environment, one of the most promising developments to emerge in the wake of COVID-19 is the accelerated use of digital health technologies among US HCOs. In response to the evolving digital health landscape, CHIME annually elevates the criteria required for organizations to achieve the varied levels of the Digital Health Most Wired program, including the standards to achieve the Super Performance level (i.e., Level 10)—the level at which organizations are recognized for demonstrating an outstanding record of leveraging HIT within a visionary corporate strategy. Remarkably, even with a heightened benchmark, the average score of participating organizations has only continued to increase over the years (Figure 3).

Figure 3

Average Digital Health Most Wired Score (2018–2023)
Percentage scores are calculated based on available points earned by organizations in DHMW survey



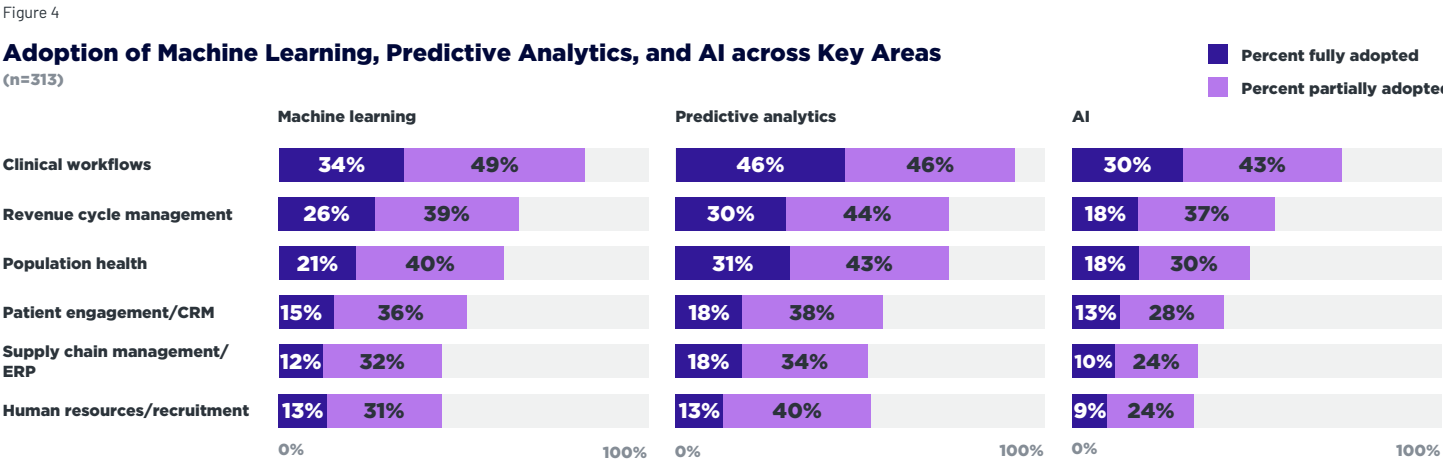
Accelerating Data Usage

Considering market conditions, the healthcare industry’s continued commitment to harnessing technology for enhanced care delivery and patient outcomes is encouraging. This commitment is facilitated by three key trends: enhanced data outputs, expanded data inputs, and elevated data direction.

1 Enhanced Data Outputs

This trend involves advancements metabolizing data that can optimize decision-making (i.e., provide relevant data and insights at the right time and speed to the right people).

Adoption of Advanced Analytics and AI



Note: Definitions for adoption levels are found in the section titled [Accelerating Data Usage vs. Adoption Technology](#).

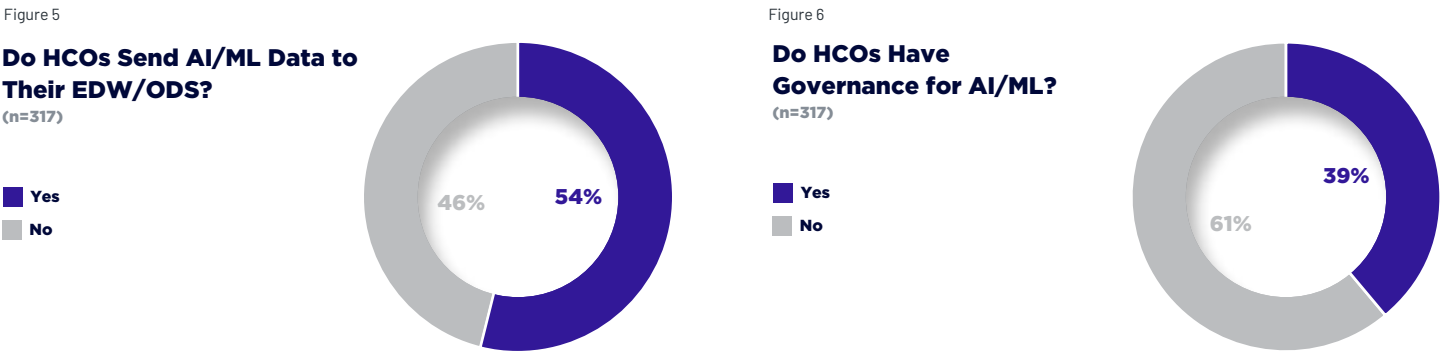
Data is being collected and stored at unprecedented rates, and HCOs are consequently embracing advanced analytics (e.g., machine learning, predictive analytics) to enhance data utility. As shown in Figure 4, over 80% of interviewed HCOs report leveraging some form of advanced analytics in their organization. Analytics use cases—such as enhancing clinical workflows—are often consistent across respondent organizations.

However, having the ability to use analytics does not always translate to HCOs fully adopting analytics. HCOs often use multiple vendors’ solutions across different locations and departments, inhibiting seamless integration. Realizing the full potential of analytics, especially Artificial Intelligence (AI) requires the alignment of technology, data and strategy. Further, some advanced analytics capabilities necessitate close collaboration between the HCO and their vendor to achieve optimal results; depending on the level of partnership and support provided by the vendor, success can vary.

In the past few years, the healthcare industry’s view of and enthusiasm for AI has become more grounded—many HCOs that were initially skeptical about AI’s ability to impact care now feel more enthusiastic, and conversely, many who were previously very excited now feel more moderately excited. Most C-suite leaders say AI is where they have seen the greatest progress and improvement in recent years; generative AI has particularly helped the healthcare industry understand that data can have a broader impact beyond operational efficiencies. Promising use cases include documentation improvement, imaging, patient scheduling, revenue cycle management, care management, usage of big data to improve diagnostics and reduced length of stay.

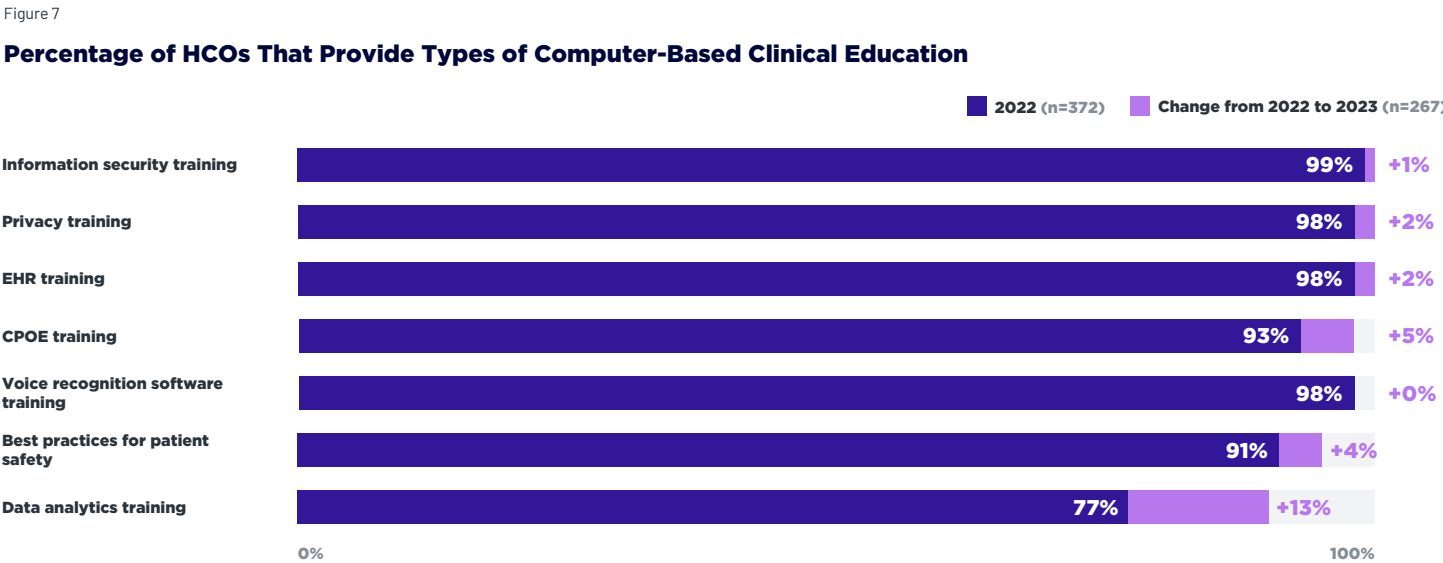
AI Governance

As HCOs move toward the promising applications of AI, it is important to remember that innovation should not overshadow data governance. The 2023 DHMW survey shows that HCOs' efforts to govern AI are varied. While they use AI to support an array of functions, just over half of respondents send AI data to their organization's enterprise data warehouse and/or operational data stores (Figure 5) with only around 40% of organizations claiming to have AI governance in place (Figure 6).



Advanced Analytics Training

To ensure advanced analytics continue to accelerate data usage in HCOs, end users need to understand how to use data outputs. Since the beginning of the COVID-19 pandemic, clinicians have continually advocated for self-directed, computer-based training programs so that they can adapt to emerging technologies and evidence-based practices. Additionally, the widespread adoption of data analytics within HCOs has increased the market demand for computer-based data analytics training (Figure 7). As data analytics becomes more integral to healthcare decision-making and patient care improvement, healthcare professionals need training programs that can equip them with the skills and knowledge to leverage data effectively. One challenge for HCOs is finding ways to scale ongoing training, especially for systems that are rapidly evolving and have frequent impactful updates. Not all organizations have designated learning and development departments; for these organizations, the training burden falls to the IT department.



2 Expanded Data Inputs

The pervasive influence of consumerism in the healthcare market is profoundly impacting the acceleration of data usage in HCOs and is the second market force reflected in the 2023 DHMW survey findings.

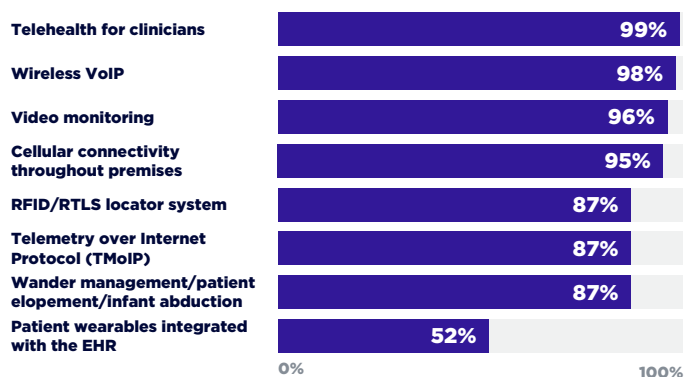
Investments in Patient-Generated Health Data Solutions

Patients today seek more personalized and convenient healthcare experiences that are akin to the seamless interactions they encounter in other aspects of their digital lives. Responding to consumer expectations, technology companies have released an array of patient-generated health data (PGHD) solutions to meet market demands. From wearable fitness trackers to mobile health apps and remote monitoring devices, these consumer technologies are democratizing access to health-related information and interventions. They empower individuals to actively participate in their own health management, facilitate remote care delivery and enable healthcare stakeholders to make informed decisions based on real-time data. The convergence of these technologies reflects a fundamental shift toward a more patient-centric and data-driven healthcare landscape where the boundaries between traditional healthcare and consumer technologies are blurred, enhancing overall health outcomes and experiences. It also adds another layer of data complexity to the overall healthcare IT picture. These data points have the potential to accelerate and transform population health and patient outcomes, but only if managed, integrated and used to guide decision-making effectively.

Figure 8

Percentage of HCOs Supporting Wireless Technology

(n=314)



The growing ubiquitous presence and use of PGHD devices present HCOs with an expanded source of health data inputs to harness. Evidence from the 2023 DHMW survey indicates HCOs are working diligently to accommodate and support the numerous patient-wearable devices in use today and integrate this data into the EHR (Figure 8).

As HCOs work to converge personal technologies and healthcare, data security and interoperability, they are poised like never before to deliver more effective, proactive and patient-centric care, all while giving patients a larger role in managing their health. For those who are furthest along in deploying technology to support these strategies, two areas of focus have been 1) measuring the effectiveness of these patient engagement and consumer strategies and 2) making adjustments to achieve optimal results.

Healthcare Workers and Consumer Technologies

The trend of consumerism in health technology extends to peripheral consumer technologies like voice assistants, though their use is still nascent in many patient care settings (Figure 9).

Figure 9

Percentage of HCOs Supporting Caregiver Workflow Technology

(n=314)

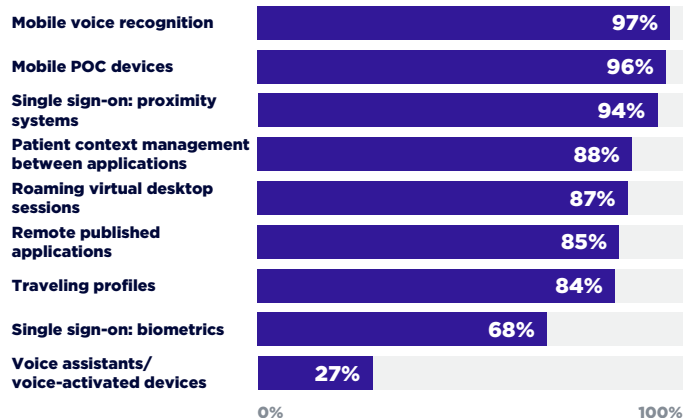
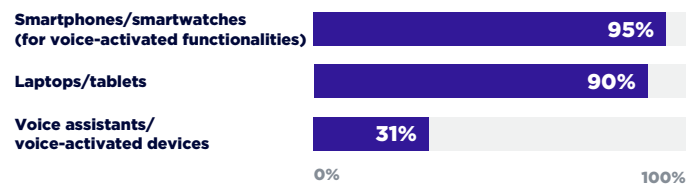


Figure 10

Percentage of HCOs Supporting Use of Employee-Owned Devices in Patient Care (n=314)



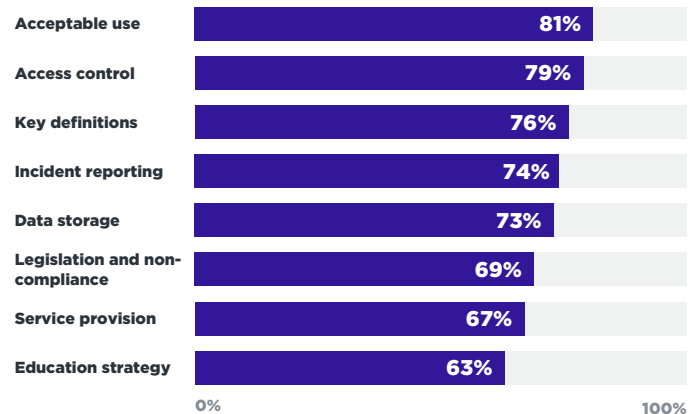
The use of employee-owned technologies, like smartphones and tablets, is also steadily growing in the delivery of healthcare. These devices serve as valuable, flexible, and convenient tools for accessing medical information, communicating with colleagues and patients, and streamlining various aspects of healthcare delivery (Figure 10).

While consumer devices present opportunities for greater mobility and connectivity, HCOs need to balance leveraging them to improve care delivery with also ensuring data security and compliance with regulatory requirements—as the amount of data increases, so does the need to protect that data.

Fortunately, evidence indicates that the majority of HCOs have implemented policies governing the use of personal devices. While almost all participating DHMW HCOs (98%) reported their bring-your-own-device (BYOD) policy included at least one of the eight elements considered in the DHMW survey, the elements most closely aligned with patient-data protection—acceptable use and access control—were understandably the most-cited elements included in organizations' policies (Figure 11). By instituting clear and comprehensive policies, organizations are striving to balance the convenience and familiarity of personal devices with the need to safeguard sensitive information, ultimately supporting the delivery of safe and efficient patient care.

Figure 11

Percentage of HCOs Reporting Select Elements as Part of Their BYOD Policies (n=314)



3 Elevated Data Direction

The third and final trend facilitating the acceleration of data usage in HCOs involves the expanded reliance on specialized and dedicated leaders to guide data usage.

Growing Complexity of the CIO Role

With so many complex priorities, versatile data sets and emerging technologies, the role of chief information officer (CIO) has grown increasingly complex. To effectively shepherd the usage of data, a myriad of specialty roles has surfaced. The 2023 survey highlights numerous instances where the historical CIO role is undergoing a transformative shift as new specialty leaders emerge for various domains (e.g., cybersecurity, analytics, innovation). In some cases, these new roles still fall under the oversight of the CIO, but this trend underscores the need for HCOs to clearly define and delineate roles and responsibilities in relation to the CIO.

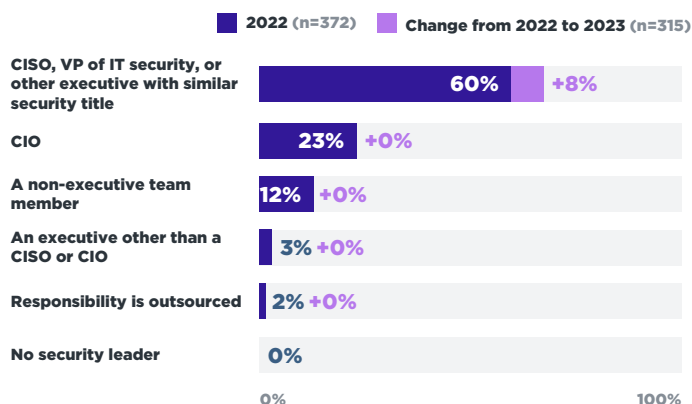
As specialized leadership positions gain prominence in areas like security, data analytics, telehealth and innovation, it is increasingly important to establish clear boundaries and relationships, ensuring that each leader can effectively contribute to the organization's overarching digital health strategy. This includes ensuring that these and other C-suite roles have the insights and data needed to review progress and adjust in these critical areas of focus. Overall, this role's evolution reflects the dynamic healthcare landscape; the advancement of technology coupled with more-specialized leadership is reshaping the leadership structure at many HCOs.

Cybersecurity

The evolving role of the CIO is perhaps best illustrated by the noticeable gap emerging in US HCOs around cybersecurity leadership. Increasingly, HCOs are reacting to cybersecurity regulations and market shifts by appointing leaders whose sole focus is information security (Figure 12). This emergence of dedicated information security leaders reflects an acute awareness of the escalating volume and complexity of cybersecurity threats in healthcare. Hiring specialized information security leaders is an essential move for organizations striving to safeguard sensitive patient data and protect critical healthcare systems. Cybersecurity challenges require a proactive approach, and this includes leadership changes that facilitate developing robust cybersecurity strategies to create a detailed picture of current risks and their potential impact, fortify HCOs' defenses and ensure the integrity and security of their digital assets.

Figure 12

Percentage of HCOs Reporting Role That Is Primarily Responsible for Information Security Efforts

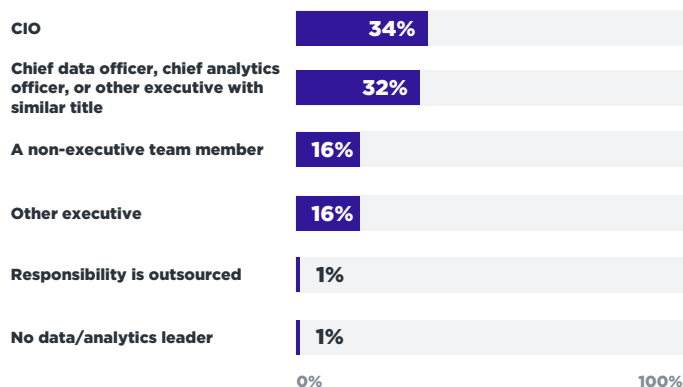


Analytics

Like cybersecurity, data analytics is seeing more and more prominent specialized roles, like chief data officers (CDOs) and chief analytics officers (CAOs) (Figure 13). These leaders are increasingly vital to manage the wealth of data generated by expansive healthcare systems. Their roles extend beyond data protection and encompass strategic data utilization and advanced analytics to drive operational efficiencies, enhance patient care and support evidence-based decision-making. The CIOs' enduring involvement in data and analytics can be partly attributed to this area's intricacies—healthcare entities frequently use many disparate systems, resulting in a diverse and decentralized data landscape. Consolidating this wealth of data to facilitate effective and secure utilization is a formidable undertaking. In this context, CIOs serve as linchpins, navigating data integration and analytics management to facilitate data-driven decision-making and ultimately advance high-quality healthcare delivery.

Figure 13

Percentage of HCOs Reporting Role That Is Primarily Responsible for Analytics/Data Management (n=315)



Innovation

The role of chief innovation officer is gaining prominence in many organizations, marking a shift from the traditional approach of the chief information officer primarily driving innovation (Figure 14). In most HCOs, the CIO remains at the forefront of steering innovation efforts, orchestrating the integration of cutting-edge technologies to enhance patient care and operational efficiency. However, the likelihood of the CIO owning innovation depends considerably on the size of the HCO. Smaller organizations often rely more heavily on the CIO for innovation, while larger institutions are more likely to appoint dedicated chief innovation officers to spearhead their transformative endeavors (Figure 15).

Figure 14

Percentage of HCOs Reporting Role That Is Primarily Responsible for Technical Innovation (n=314)

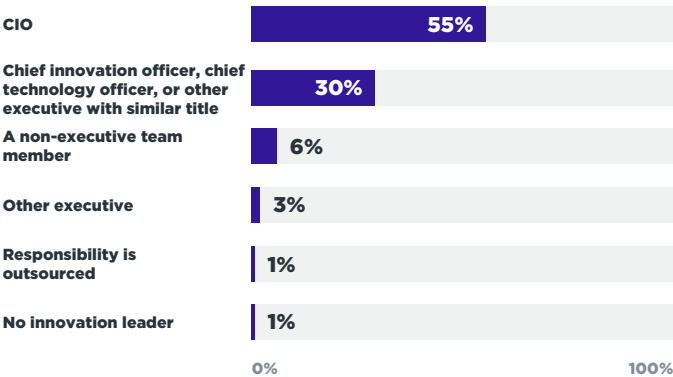
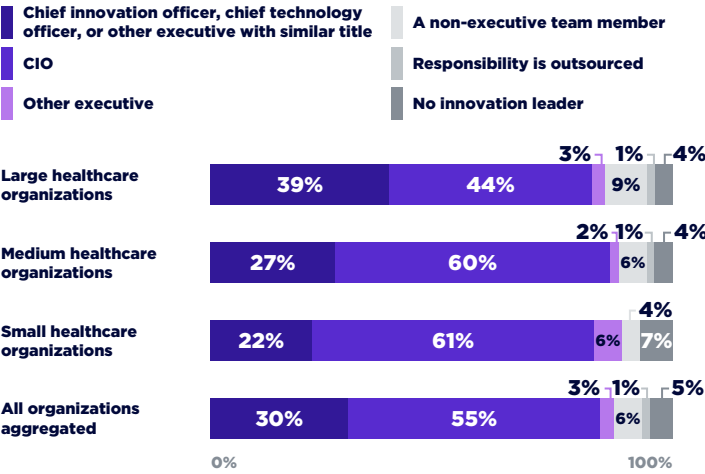


Figure 15

Percentage of HCOs Reporting Role That Is Primarily Responsible for Technical Innovation—by HCO Size (n=314)



HCO Size and Specialty Leaders

Smaller HCOs are much less likely to have specialty leaders across specialty areas. Consequently, they often rely on CIOs to assume these multifaceted roles and additional responsibilities. CIOs in smaller organizations must receive the necessary support and resources to effectively address the demands of these specialty areas. Small organizations often report unique challenges with leadership balancing multiple roles, so it is crucial to empower CIOs to navigate the complexities of healthcare technology, data management and innovation while delivering quality care to patients.

The divide in specialty leadership is perhaps best illustrated by considering cybersecurity leadership. While the trend of more security officers in HCOs is encouraging, significant disparities remain across types of HCOs. Smaller HCOs in particular are less likely to have a dedicated security leader in place (Figure 16 and 17). In many of these smaller entities, the CIO still takes on the responsibilities of an information security leader. This approach may reflect resource constraints smaller HCOs face. It also highlights the need for tailored strategies to address cybersecurity challenges across the diverse landscape of healthcare. Even smaller institutions need to effectively protect sensitive data and healthcare systems in an increasingly complex threat environment. Technology partners and service firms working with this demographic of customer have the opportunity to support the CIO by providing guidance and education.

Figure 16

Percentage of HCOs with CISO, VP of Information Security, or Other Executive over Cybersecurity—by HCO Size (n=315)

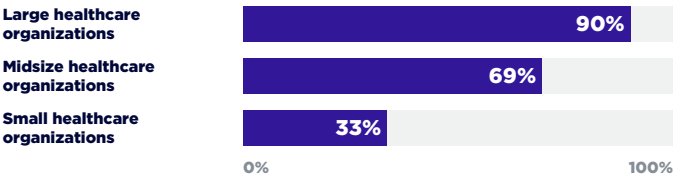
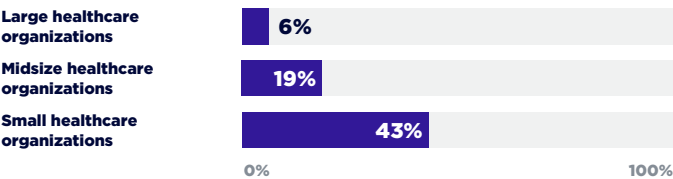


Figure 17

Percentage of HCOs with CIO over Cybersecurity—by HCO Size (n=315)



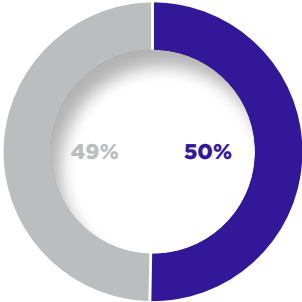
An HCO's size also correlates with affiliations with healthcare innovation centers (Chart 19). These innovation centers have emerged as valuable partners to help enhance organizations' IT capabilities, and they also function as platforms for introducing internally developed solutions to the market, thus driving HCOs' revenue. Larger HCOs are more inclined to establish and maintain partnerships with innovation centers; they leverage their broader resources and expertise to foster innovation, refine IT strategies and explore novel revenue streams. In contrast, smaller healthcare entities tend to find it more challenging to engage with innovation centers because of resource constraints.

Figure 18

Percentage of HCOs Associated with a Healthcare Innovation Center

(n=313)

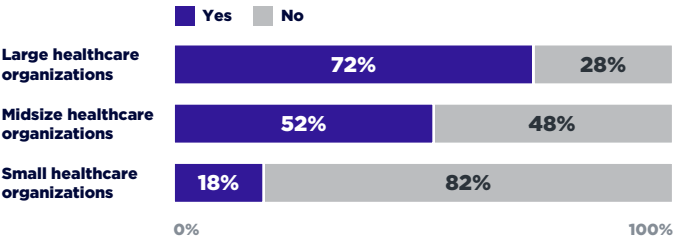
■ Yes
■ No



Note: Due to rounding, percentages may not add to 100%.

Figure 19

Percentage of HCOs Associated with a Healthcare Innovation Center—by HCO Size (n=313)



Accelerating Data Usage vs. Adopting Technology

Although HCOs may have analytics technologies or capabilities that give the appearance of accelerating data usage, end users may not necessarily be fully leveraging the technology or data. To address this potential discrepancy, the 2023 DHMW survey included the following definitions in certain sections:

Fully adopted

Technology/solution has been implemented across HCO, **and** relevant users generally use technology/solution according to industry expectations and/or organizational policy. (Note: According to survey results, this level of adoption was evident in three areas—advanced analytics, chronic care management and opioid-use reduction.)

Partially adopted

Technology/solution has been implemented in at least one area of HCO but not all, **or** technology/solution has been implemented across HCO but relevant users are not using technology/solution according to industry expectations and/or organizational policy.

HCOs should be evaluated by not only the existence of analytics technology but also adoption of that technology, thus providing a more holistic view of the technology’s role and effectiveness. For example, having the ability to use advanced analytics does not always translate to an HCO fully adopting advanced analytics. Some organizations may lack access to the specific data type required for successful implementation of analytics, and it can also be challenging to seamlessly integrate disparate data sources and effectively use them for decision-making. Additionally, analytics strategies can be ambiguous, particularly when determining the primary vendor responsible for providing and managing the technology.

To realize the full potential of advanced analytics, organizations should take a holistic approach to adoption and evaluate technological readiness, data accessibility, integration and strategy. According to interviewed analytics leaders, there are several key challenges to fully adopting and effectively using analytics tools (listed below).

Duplication of systems across the enterprise can lead to a bloated technology stack; consolidation is required to use data/analytics for decision-making and achieve desired outcomes.	Point-of-care tools and tools used by analytics departments often lack the visualization users need.	Data silos across tools and departments are difficult to bridge, and many HCOs lack the infrastructure to effectively bring data sources together; integration/aggregation capabilities are not as strong as they need to be.	Because data is siloed, it isn’t well trusted, which impacts HCOs’ ability to confidently use data for decision-making.
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Going Forward, Measuring Adoption Will Be Central to DHMW Survey

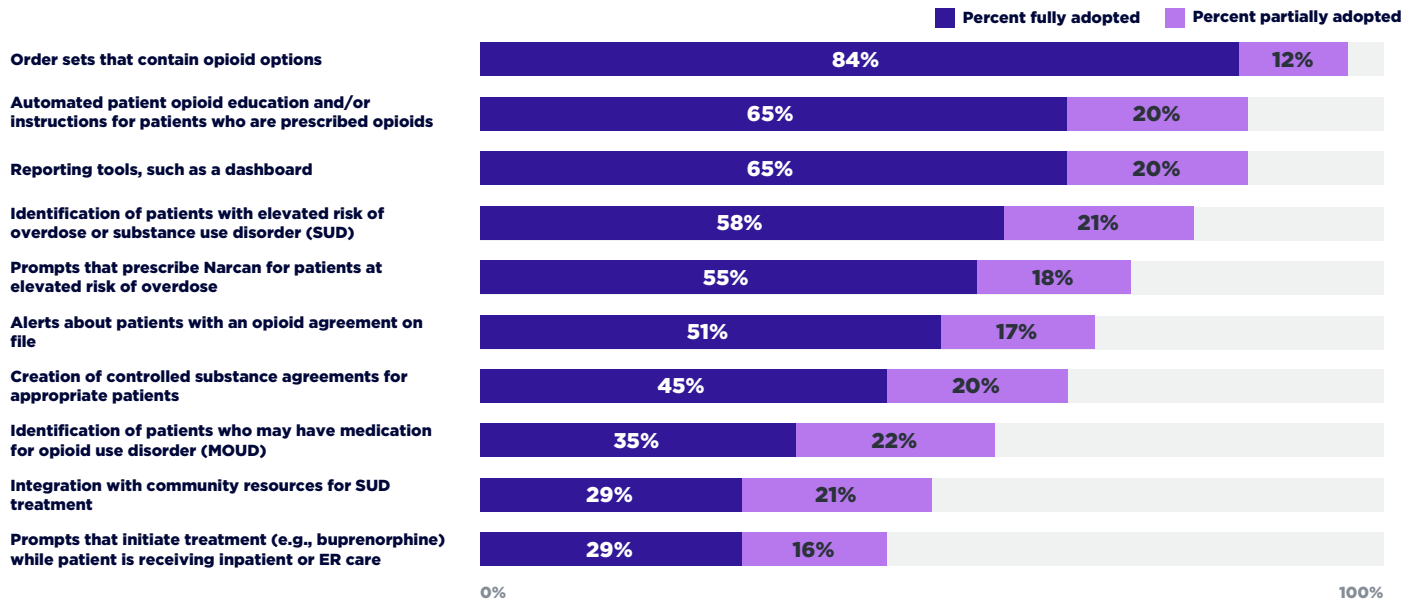
Due to the importance of deploying and adopting analytics technology, DHMW surveys going forward will seek to comprehensively understand HIT through the lens of adoption. Future reports will spotlight instances where HCOs have successfully deployed technology that is actively used and contributes to positive outcomes as well as identify challenges to achieving adoption and outcomes (e.g., training gaps, insufficient workflow optimization, resource constraints). This strategic focus will provide a nuanced look at how technology can drive outcomes for healthcare providers and patients and ultimately guide the industry toward effective and meaningful progress.

Opioid-Use Reduction

The discrepancy between implementing analytics technology and adopting that technology has real-world implications, particularly when analyzing initiatives related to reducing opioid use. Technology plays a crucial role in addressing the opioid epidemic, but the implementation and impact of it can vary across HCOs. As evidenced in Figure 20, a significant percentage of technologies implemented to support opioid-use reduction haven't been fully adopted due to (1) varying approaches to pain management, provider practices and patient education, and (2) the complex nature of addressing opioid use in healthcare settings. Effectively tackling the opioid crisis remains a multifaceted challenge that requires ongoing efforts and collaboration within the healthcare community.

Figure 20

Percentage of HCOs Adopting Technology to Support Opioid-Use Reduction Efforts (n=313)



Other Notable Trends in Healthcare IT

In addition to the market trends already highlighted in this report, the data revealed numerous insights related to key areas of interest for many HCOs. We present these via the eight sections of the survey that are used to derive an HCO's DHMW score. While each section covers a diverse ecosystem of standalone tools, platforms, and capabilities, within each are key trends worth noting about technology adoption and use.

For a more detailed discussion of each section, we encourage readers to access the accompanying Segment Reports, which can be accessed [here](#).

Infrastructure

EHR to the cloud: HCOs increasingly turn to cloud providers for EHR hosting, emphasizing early cloud adoption for disaster recovery to enhance security and reduce reliance on traditional on-premises solutions. Simultaneously, they aim to cut capital costs, favoring flexible contracting models. Due to resource limitations, third-party firms are commonly engaged to bolster resources, provide training, and facilitate transitions, addressing expertise gaps and supporting the migration process.

Infrastructure & IT outsourcing: Driven by staffing shortages and technology management challenges, adoption of infrastructure outsourcing and IT support has grown steadily, particularly in EHR-support areas like clinical service desks, IT help desks, patient portal assistance, application fixes and upgrade/testing services.

Bring-your-own-device (BYOD): When adopting employee-owned device strategies, HCOs focus on supporting clinical workflows, barcode scanning and image use. Durability, network connectivity, call quality, hot-swappable batteries, cost-effectiveness, EHR integration and deployment scale considerations also guide device choices, aligning devices with clinical demands for reliability and tailored functionality.

Security

Healthcare IoT software: The proliferation of IoT devices within HCOs is accompanied by heightened security vulnerabilities, necessitating robust protective measures. While some IoT security solutions are user friendly and require minimal training, others demand more comprehensive training, particularly for non-cybersecurity personnel. Additionally, vendors are starting to go beyond IoT to address needs such as asset management and medical device utilization. Effectively integrating these solutions with diverse systems and devices in healthcare environments remains a challenge.

Patient privacy monitoring: Patient privacy monitoring tools are increasingly harnessing AI to decrease false alarms and expedite investigations, but the impact varies. Some organizations have achieved significant benefits, while others grapple with challenges like software glitches and evolving interfaces. Larger organizations sometimes report issues like noisy data and implementation complexity, leading to dissatisfaction and exploration of alternative solutions.

Security consulting & managed services: Most healthcare IT security consulting is focused on risk assessments that pinpoint vulnerabilities and ensure regulatory compliance, with a particular emphasis on HIPAA privacy assessments.

This includes the development and evaluation of robust security programs tailored to the evolving threat landscape. Assessments dedicated to securing internet of medical things (IoMT) devices are increasingly critical to organization strategies. Given the industry's recognition of the importance of expert leadership in security, there is demand for virtual or interim chief information security officers (CISOs).

Administration & Supply Chain

ERP: HCOs are increasingly adopting cloud-based ERP platforms, which they view as an effective way to streamline operations and provide greater visibility into financial and operational data. Supply chain management within ERP systems is a continued area of focus and development. This trend is driving vendors to enhance their supply chain modules, with a specific emphasis on features like inventory management, turnover rates and reporting capabilities.

Financial planning & analysis: This software encompasses core functionalities such as capital planning and tracking, long-range planning, operational and short-term budgeting, performance reporting and rolling forecasting. Operational and short-term budgeting, as well as performance reporting, see higher adoption rates compared to rolling forecasting, which is seeing notably slower uptake. Integration plays a crucial role in the success of these solutions, with ERP integration being the most prevalent, enabling data aggregation for effective short- and long-term planning. Integration with workforce planning solutions is reported infrequently, highlighting a gap in using these tools to make informed budget decisions amid staffing shortages.

Nurse & staff scheduling: With nurse and staff scheduling solutions, organizations are focused on workload balancing, which helps address staffing gaps by taking into account factors like patient acuity and staff qualifications. Analytics for predicting short-term staffing needs are complex, with accuracy varying from a couple of days to several weeks. Factors that impact this variation include the strength of integration with HR and EHR tools as well as vendor support through training and tuning. Overall, adoption of workload balancing functionality is still limited, but adopters report positive outcomes such as reduced overtime and improved staff satisfaction.

Analytics & Data Management

Data & analytics strategies: Even as leadership and governance in this area matures, the lack of a unified data management and integration strategy hinders HCOs' progress. Organizations lack clarity on specific data tools and technologies around which to build, presenting the need for some to use data-focused cloud-based platforms and advisory services. Data and analytics plans are often limited by the ability to aggregate and manage data from the variety of solutions found within organizations.

Data & analytics platform software: The primary use of these tools today is incorporating clinical and claims data, with a growing interest in integrating social determinants of health (SDOH) and operational data. Advanced analytics utilization remains generally low, with predictive analytics being the most frequently adopted capability. Deep adopters of data platforms continue to emphasize data ingestion and cite an interest in additional advanced capabilities, such as geospatial analytics and supervised machine learning. Across lighter and deeper adopters, internal data science teams are emerging to support advanced analytics, but resource availability remains a barrier to solution adoption.

Healthcare AI data science platforms and generative AI: HCOs are grappling with the adoption of AI technologies on multiple fronts. Traditional AI platform and data science tools are used to support areas such as risk scoring, reducing readmissions, closing care gaps and minimizing claims denials. However, users of certain AI solutions encounter ease-of-use issues that hinder outcomes, particularly a lack of out-of-the-box capabilities or the ability to easily customize

models. HCOs are actively exploring generative AI adoption for diverse tasks, including note writing, patient summaries and administrative tasks. They are also considering clinical generative AI for patient messaging and various healthcare operations. Adoption hurdles include safeguarding patient data, understanding technologies and use cases, ensuring text accuracy in EHRs, integration complexities, financial considerations, and addressing accuracy, privacy and data-reliability concerns.

Interoperability & Population Health

Population health management platforms: Collaborative partnerships and optimization support are vital for customer success in population health management. HCOs and technology vendors alike are investing in robust data acquisition and analysis capabilities. In fact, organizations making purchases in population health frequently report that strong data acquisition is their top priority as they are currently experiencing challenges with integration, inaccurate or stale data, or high costs that aren't sustainable. Organizations are also seeking reporting tools for financial assessment in risk-based reimbursement models. Third-party vendors play a growing role in enabling value-based contract revenue, providing not only tools but also strategic guidance. Care management and clinician engagement are areas where the market would like to see additional focus.

EMR interoperability: There is continued progress in this area, with organizations reporting gains in their ability to electronically access data from data exchange partners. Additionally, more organizations are reporting that record location is becoming automatic or that records are easier to locate. There is still room for progress when it comes to integrating this data into the clinical view, whether directly into the EHR or through separate tabs and when it comes to using this data to consistently impact patient care.

Interoperability facilitators and platforms: Historical interoperability facilitators are broadening offerings to meet needs around data repositories, digital fax, Direct messaging, HIEs, integration engines and lab interoperability. Technology vendors in this space continue to find that unstructured data is still one of the biggest barriers to interoperability, and provider organizations and vendors are working to move unstructured data more efficiently. The process typically requires manual data mapping, but the lack of standards for unstructured data makes this mapping hard to replicate.

Patient Engagement

Patient engagement goals: Beyond the hope that engaging patients in their care will support population health and value-based care initiatives, in the current financial landscape there is great interest in leveraging patient engagement tools to increase volumes by improving patient access. These patient access challenges include the need for fully automated self-scheduling, electronic intake/registration, a variety of paths for electronic patient bill pay and physician identification.

Growth in less-common platform capabilities: Patients increasingly want to be empowered in their care journey; as a result, vendors continue developing and providers continue investing in core patient engagement capabilities, such as self-scheduling and self-registration. Other capabilities, such as online bill pay and prescription refill requests, have also received significant development in the past two years. Beyond the key platform capabilities, a couple of other patient-centric capabilities have seen recent growth. Price transparency is one that has seen some of the most growth, given that the US recently passed legislation related to healthcare price transparency. However, there is still room to grow, as few patient engagement vendors offer price transparency capabilities. Virtual tours, while

still delivered mostly by niche vendors focused on that area, have had increased development by broader patient engagement vendors in the last several years.

The need for communication tools to evolve: While many organizations still say they will need a variety of patient engagement tools and vendors to meet their needs over the next several years, one area many are eyeing for consolidation is patient communication. These organizations either feel they have deployed too many texting solutions or are hoping to get more “bang for their buck” by adopting communication tools that they feel can play a more strategic role than just providing appointment reminders. Specifically, they are hoping for self-scheduling capabilities, better care management tools, easier bidirectional communication with patients, and tools that can integrate tightly with their EHR so that manual tasks can be automated amid staffing shortages.

Clinical Quality & Safety

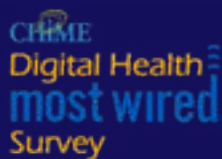
Safety, risk, and compliance: In healthcare safety, risk and compliance, specific functionality strengths and weaknesses continue to be identified by the market. Strengths include robust reporting and analytics capabilities, comprehensive offerings with broad functionalities and ease of customization. However, smaller organizations say they cannot always take advantage of these tools because of cost considerations. Newer technology entrants are striving to enhance their technology to meet the needs of this end of the market. When it comes to adoption of specific functionalities, patient and visitor safety, risk management for claims, patient experience and relations and employee health and safety have seen the most adoption. Provider management and performance, enterprise risk management and compliance are areas where adoption is less frequent.

Enterprise imaging: Enterprise imaging encompasses many solution types, with vendor neutral archives (VNAs) and universal viewers (UVs) at the core of most HCOs’ strategies. Adoption of VNAs is increasing for their ability to store and manage medical images across various service lines. Key functionality improvements in this area include VNAs that are truly neutral in handling different image types, ease of administration and flexibility in supporting multiple service lines. UVs are still largely used for referential viewing, though the number of organizations using their tools for diagnostic viewing continues to grow year over year. Organizations frequently report that they can access images diagnostically, but the trend in adoption of deeper capabilities is still behind.

Transitions of care: EHRs are still the primary technology many HCOs use to manage transitions of care (TOCs), specifically for bundling patient information, data exchange and clinician notifications. However, most organizations tend to not use their EHR vendor’s technology for additional TOC processes, such as prior authorization, patient matching and referral management, due to complexity and resource requirements. Standalone technologies are used either exclusively or alongside the EHR solution. Using these technologies alone is most frequently reported in long-term care and home health environments because of the technologies’ specialized functionality and perceived cost-effectiveness.

Leadership and structure: As previously discussed, aspects of the CIO role are being divvied up and allocated to other executive-level positions, accelerating the emergence of specialized roles within organizations.

Innovation profile: The most maturely developed areas of innovation in HCOs relate to leadership, strategic planning and execution and organizational culture that encourages innovation. Organizations that have optimized these areas drive forward-thinking initiatives and nurture work environments that foster creativity and adaptability. On the other hand, performance management is the least mature area among organizations. Organizations may need to further optimize and refine this area to ensure alignment with evolving priorities and to maximize the impact of innovation efforts. Finding effective ways to measure innovation can be challenging, and this is another area where access to good data has the potential to accelerate change and support improvement efforts.



About CHIME

The College of Healthcare Information Management Executives (CHIME) is an executive organization dedicated to serving chief information officers (CIOs), chief medical information officers (CMIOs), chief nursing information officers (CNIOs), chief innovation officers (CIOs), chief digital officers (CDOs), and other senior healthcare IT leaders. With more than 5,000 members in 58 countries plus 2 US territories and over 190 healthcare IT business partners and professional services firms, CHIME and its three associations provide a highly interactive,

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About Digital Health Analytics

Digital Health Analytics (DHA) is a global market intelligence and survey research hub for digital health technology. Provided by the College of Healthcare Information Management Executives (CHIME), DHA was created in 2022 to supercharge organizations' digital health transformation capabilities by moving from a one-snapshot-in-time, static Most Wired survey to a 365/24/7 data and analytics resource. DHA is the gateway for provider organizations

and companies to better understand how digital technology supports leaders in transforming health and care and delivering data insights that help them make the greatest business impact possible. For more information, please visit dhanalytics.org.



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