HEALTHCARE'S
MOST WIRED:
NATIONAL TRENDS 2021

Introduction

The COVID-19 virus has tried the healthcare system in innumerable ways. Despite these challenges, healthcare employees, organizations and vendors have fought back and continue to fight against this global pandemic. HealthCare's Most Wired research strives to evolve and push technology standards to better support healthcare organizations, thereby improving care delivery and enhancing the patient experience—during and beyond the pandemic.
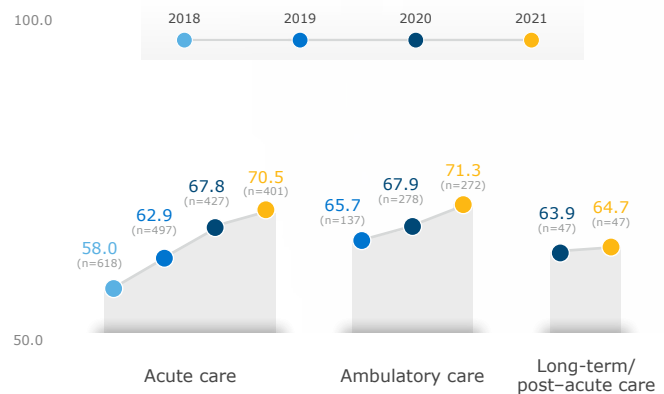
Over the past four years, the Most Wired survey has expanded to ambulatory and long-term/post–acute care (LTPAC) facilities. Each year, an average of 2,200 acute care facilities across the United States are represented. Participating ambulatory facilities have more than doubled since 2019 (the first year they were measured), increasing their numbers to 33,829 in 2021. An increasing number of LTPAC facilities have participated as well (449 in 2021).

Across all healthcare organization types, average final scores have continued to increase over the past four years as organizations advance their technology and practices.

The areas that have seen the biggest overall score improvements include patient engagement, interoperability and population health management. This change reflects an increasing desire for transparency (in care and in healthcare billing), telehealth and value-based care. Over the years, acute care organizations have also notably increased their overall score for clinical quality and safety (up 17.2 percentage points since 2018).

Throughout this report, findings and trends are generally parallel for acute and ambulatory care organizations, while LTPAC organizations tend to have lower adoption or have reached a less-advanced technology state compared to their acute and ambulatory care counterparts. Unless otherwise specified, data shown is focused on acute care.

Average Final Score

2018 2019 2020 2021

Acute care
58.0 (n=618)
62.9 (n=497)
67.8 (n=427)
70.5 (n=401)

Ambulatory care
65.7 (n=137)
67.9 (n=278)
71.3 (n=272)

Long-term/ post–acute care
63.9 (n=47)
64.7 (n=47)

Note: Final scores are given at the organization level; organizations may comprise many different facilities.

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COVID-19

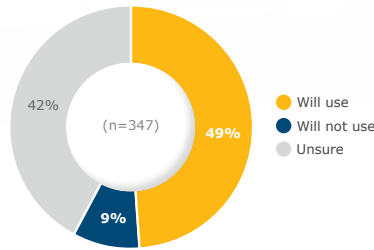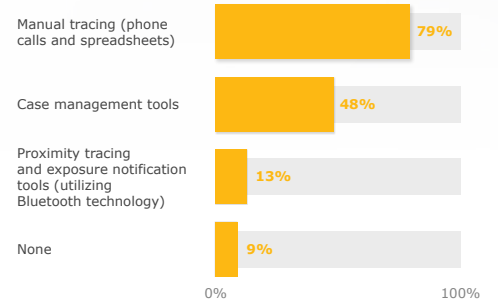## Contact Tracing Technology Rare but Part of the Future

Although advanced tools for contact tracing are available—such as proximity tracing through Bluetooth technology—few organizations were able to use this technology to trace COVID-19 transmission in the last year (13% of acute care, 10% of ambulatory care, 9% of LTPAC). It has been much more common for organizations to rely on manual tracing via phone calls and spreadsheets (used by about 77% across organization types). Looking to the future, however, about half of surveyed organizations plan to continue using contact tracing technology for communicable diseases beyond COVID-19.

Plans to Continue Using Contact Tracing Technology for Other Communicible Illness Beyond COVID-19
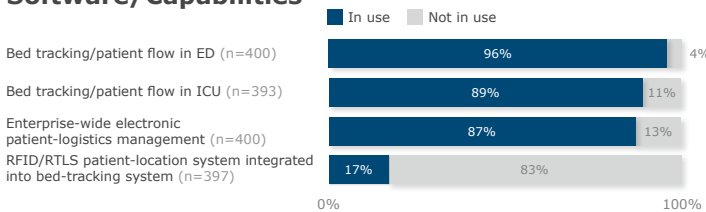
- (n=347)
- 49% Will use
- 9% Will not use
- 42% Unsure

Use of Contact Tracing Technology for COVID-19 Management (n=401)

Manual tracing (phone calls and spreadsheets)	79%
Case management tools	48%
Proximity tracing and exposure notification tools (utilizing Bluetooth technology)	13%
None	9%

0% — 100%

Patient Flow Adoption Continues to Grow

Adoption of patient flow software has continually increased over the past several years. Nearly 87% of organizations (acute and ambulatory care) have adopted an enterprise-wide patient flow system, and high adoption in critical areas has been beneficial during the pandemic. RFID/RTLS utilization is still minimal, but there has been a slow increase as adoption among acute care organizations grew by 4 percentage points from 2020 to 2021.

Adoption of Bed-Tracking or Patient Flow Software/Capabilities

■ In use ■ Not in use

	In use	Not in use
Bed tracking/patient flow in ED (n=400)	96%	4%
Bed tracking/patient flow in ICU (n=393)	89%	11%
Enterprise-wide electronic patient-logistics management (n=400)	87%	13%
RFID/RTLS patient-location system integrated into bed-tracking system (n=397)	17%	83%

0% — 100%

Strong Reporting Capabilities for Vaccination Data

Organizations report that during the pandemic, they have had an excellent ability to communicate with public health entities via their EHR. Three-quarters of organizations are able to share bed-capacity information via the EHR to better coordinate care. Over 90% of organizations can report data on vaccination and COVID-19 testing to local, state and federal agencies. Slightly fewer ambulatory and LTPAC organizations are able to report this same data.

Data Reportable by EHR to Local, State, and Federal Public Health Entities (n=401)

Vaccination	94%
COVID-19 testing	92%
Bed capacity	72%
None	3%

0% — 100%
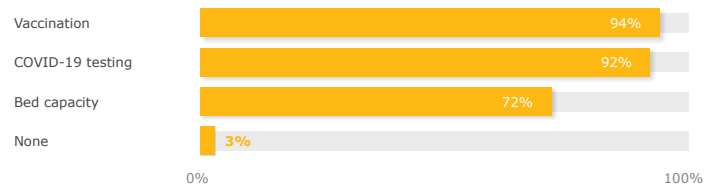
Travel Restrictions and Operational Budget Cuts Relieve Financial Pressure

For all organization types, the most frequently implemented cost-reduction initiatives in the past year were travel restrictions and operational budget cuts (used by about 60%–70% of organizations). The percentage of LTPAC organizations that had operational budget cuts was 12 points higher than acute and ambulatory care organizations. Many non-clinical employees also began working from home. Nearly one-quarter of organizations (23% of acute care, 24% of ambulatory care, 20% of LTPAC) report having >75% of non-clinical employees working from home. Regardless of their current work-from-home levels, about three-quarters of organizations plan to expand or maintain work-from-home opportunities for non-clinical employees.

Initiatives Implemented to Address Ongoing Financial Constraints (n=401)

Travel restrictions	69%
Operational budget cuts	60%
Capital budget cuts	56%
Hiring freeze or slowdown	49%
Training and education budget cuts	37%
Real estate reduction	33%
Reduction of employee hours	26%
Staff reduction	26%
Compensation reduction	19%
Other	16%
None	16%

0% — 100%
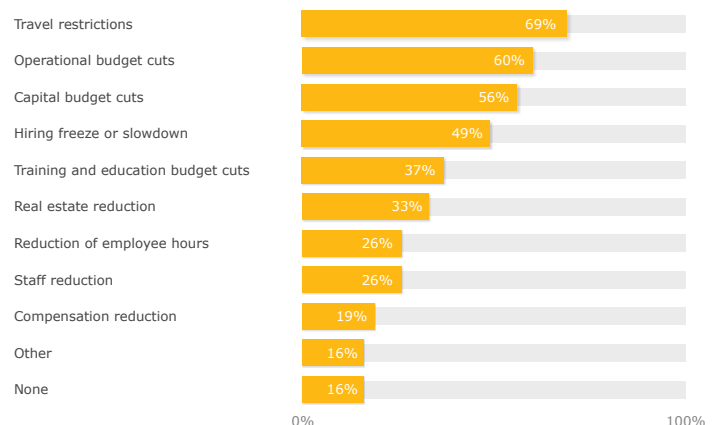
Value-Based Care

Alternative Payment Model Adoption Has Slowed amid Pandemic Pressures
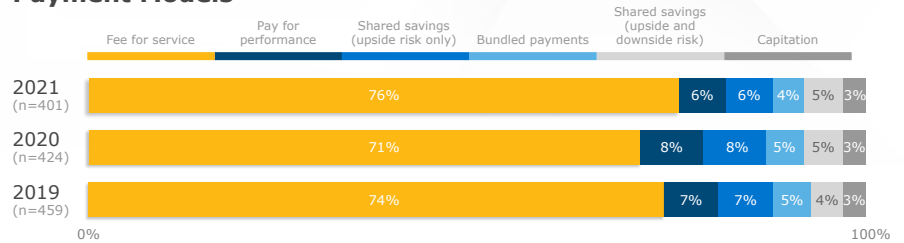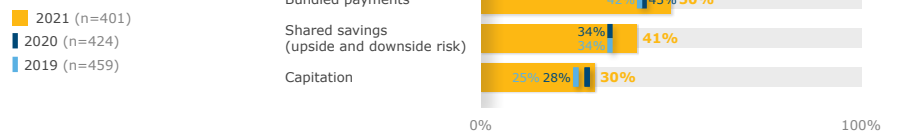
While a higher percentage of organizations are participating in individual value-based care payment models (up an average of 5 percentage points compared to 2020), the share of organizations relying more heavily on fee-for-service payment models has also grown. With immense financial pressure from the COVID-19 pandemic and limited resources to push for value-based care initiatives, alternative payment models have taken a back seat. In 2020 the average total revenue from fee-for-service models was 71%; in 2021 that number increased to 76%, surpassing the 2019 total of 74%.

Lower-risk alternative payment models continue to see greater adoption than higher-risk models. The rate of adoption increase is higher for certain payment models; shared savings with upside risk only and shared savings with both upside and downside risk grew the most (by 9 and 7 percentage points, respectively). A greater share of acute care organizations (50%) engage in bundled payments compared to ambulatory care (44%) and LTPAC organizations (43%).

Percent of Total Revenue Coming from the Following Payment Models

Legend: Fee for service | Pay for performance | Shared savings (upside risk only) | Bundled payments | Shared savings (upside and downside risk) | Capitation

2021 (n=401): 76%, 6%, 6%, 4%, 5%, 3%
2020 (n=424): 71%, 8%, 8%, 5%, 5%, 3%
2019 (n=459): 74%, 7%, 7%, 5%, 4%, 3%

Percent of Organizations Participating in the Following Payment Models

2021 (n=401)
2020 (n=424)
2019 (n=459)

Fee for service: 80%, 91%, 98%
Pay for performance: 59%, 62%, 65%
Shared savings (upside risk only): 52%, 53%, 61%
Bundled payments: 42%, 43%, 50%
Shared savings (upside and downside risk): 34%, 34%, 41%
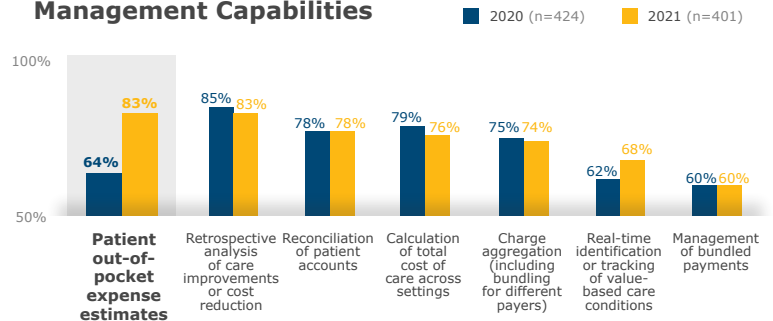Capitation: 25%, 28%, 30%

Price Transparency an Increasing Priority; Room for Growth in More Complex Capabilities

The adoption of revenue cycle and contract management capabilities was consistent overall during the past year, with 2021 seeing a particularly large increase in organizations adopting the ability to estimate patient out-of-pocket expenses (up 19 percentage points). This increase is largely due to CMS' new proposed requirements for increased price transparency. An even higher percentage of ambulatory care and LTPAC organizations report the ability to provide out-of-pocket price estimates (86% and 91% respectively, compared to acute care at 83%). It is important to note, however, that not all price transparency mechanisms and tools are equal in their accuracy and ability to handle the complexity of healthcare costs.

A wide spectrum of capabilities is included under price transparency. The most basic is providing a list of procedures and services with associated prices; nearly all organizations have this available to patients (95% of acute care and 92% of ambulatory care). 50% of acute care organizations are able to offer that price list via a mobile app. Other price transparency capabilities have increased in adoption by an average of 20 percentage points since 2020.

Insurance is a major factor in determining what patients will have to pay, so it is encouraging that the second-most-adopted price transparency capability is cost burden estimates based on insurance type (67%). Price comparisons by insurance plan/type and network have the largest upticks in adoption since 2020 (up 37 percentage points and 36 percentage points, respectively).

Adoption of Revenue Cycle and Contract Management Capabilities

2020 (n=424) 2021 (n=401)

Patient out-of-pocket expense estimates: 64%, 83%
Retrospective analysis of care improvements or cost reduction: 85%, 83%
Reconciliation of patient accounts: 78%, 78%
Calculation of total cost of care across settings: 79%, 76%
Charge aggregation (including bundling for different payers): 75%, 74%
Real-time identification or tracking of value-based care conditions: 62%, 68%
Management of bundled payments: 60%, 60%

Price Transparency Capabilities Provided to Patients

2021 (n=401) 2020 (n=424)

List of procedures/services with associated price: 87%, 95%
Cost-burden estimation based on insurance type: 40%, 67%
Price comparison/filtering based on procedure/service type: 32%, 62%
Definition of key terms: 35%, 60%
Education on price transparency tools: 35%, 59%
Price comparison based on insurance plan/type: 16%, 53%
Price comparison based on insurance network: 14%, 50%
Price comparison/filtering based on hospital/health system: 17%, 34%
Price comparison based on region: 15%, 26%
Tools that integrate patient bills with social media to support healthcare fundraising efforts and transparency: 14%, 18%
List of clinicians with associated prices: 10%, 14%
Price comparison/filtering based on clinician: 7%, 11%
No price transparency capabilities available: 3%, 9%

Population Health Management

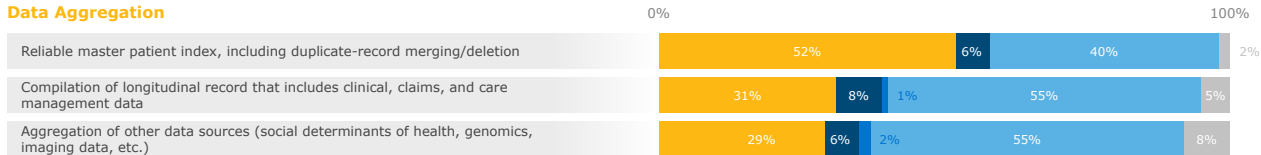## Steady Participation in Population Health Activities

Participation in population health activities has remained steady in the last year, with the average increase ranging from 1–4 percentage points. The activity with the highest adoption increase is use of tailored advanced analytics (up 6 points); however, advanced analytics remains one of the least adopted population health activities (in use by 78% of acute care and ambulatory care organizations and 63% of LTPAC). Only two other population health activities are adopted by <90% of acute care organizations: use of social care networks for social determinants of health (81%) and full CRM (74%). These three activities are also the ones most often done via homegrown solutions (by 20%–26% of organizations).

Across population health activities, most organizations rely on their EHR or a combination of technologies. On average, three-fifths of organizations using multiple types of technology use their EHR and a third-party solution. Third-party solutions are used more often than EHRs outside the clinical setting (primarily administrative and financial reporting). Across activities, LTPAC organizations are much more likely to use homegrown solutions.
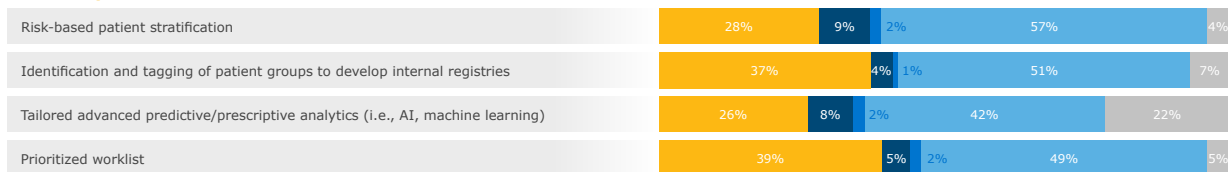
Technology Used for Population Health Management Activities (n=401)

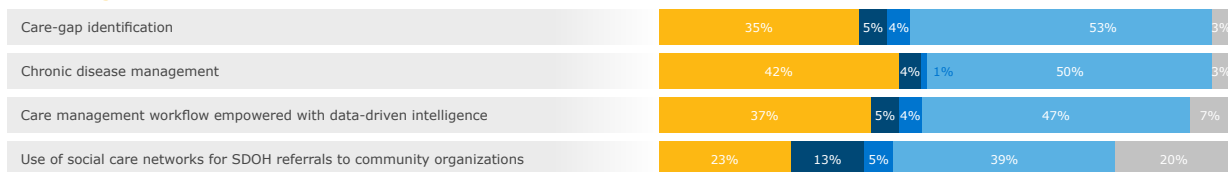Legend: EHR only | Third-party only | Homegrown only | Combination of 2 or more tool types | N/A
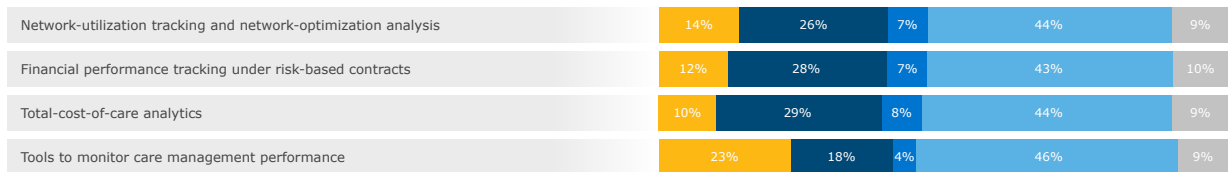
Data Aggregation

Activity	EHR only	Third-party only	Homegrown only	Combination of 2 or more tool types	N/A
Reliable master patient index, including duplicate-record merging/deletion	52%	6%		40%	2%
Compilation of longitudinal record that includes clinical, claims, and care management data	31%	8%	1%	55%	5%
Aggregation of other data sources (social determinants of health, genomics, imaging data, etc.)	29%	6%	2%	55%	8%

Data Analysis

Activity	EHR only	Third-party only	Homegrown only	Combination of 2 or more tool types	N/A
Risk-based patient stratification	28%	9%	2%	57%	4%
Identification and tagging of patient groups to develop internal registries	37%	4%	1%	51%	7%
Tailored advanced predictive/prescriptive analytics (i.e., AI, machine learning)	26%	8%	2%	42%	22%
Prioritized worklist	39%	5%	2%	49%	5%

Care Management

Activity	EHR only	Third-party only	Homegrown only	Combination of 2 or more tool types	N/A
Care-gap identification	35%	5%	4%	53%	3%
Chronic disease management	42%	4%	1%	50%	3%
Care management workflow empowered with data-driven intelligence	37%	5%	4%	47%	7%
Use of social care networks for SDOH referrals to community organizations	23%	13%	5%	39%	20%

Administrative & Financial Reporting

Activity	EHR only	Third-party only	Homegrown only	Combination of 2 or more tool types	N/A
Network-utilization tracking and network-optimization analysis	14%	26%	7%	44%	9%
Financial performance tracking under risk-based contracts	12%	28%	7%	43%	10%
Total-cost-of-care analytics	10%	29%	8%	44%	9%
Tools to monitor care management performance	23%	18%	4%	46%	9%

Patient Engagement

Activity	EHR only	Third-party only	Homegrown only	Combination of 2 or more tool types	N/A
Targeting patients for outreach	31%	7%	2%	57%	3%
Secure messaging among patients, care providers, and care managers	50%	8%		39%	3%
Full CRM (including integrated patient portal, patient outreach, patient education, and patient satisfaction solutions)	22%	11%	2%	39%	26%

Clinician Engagement

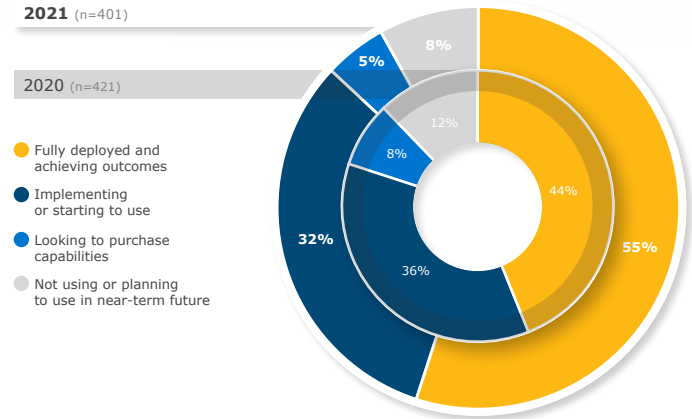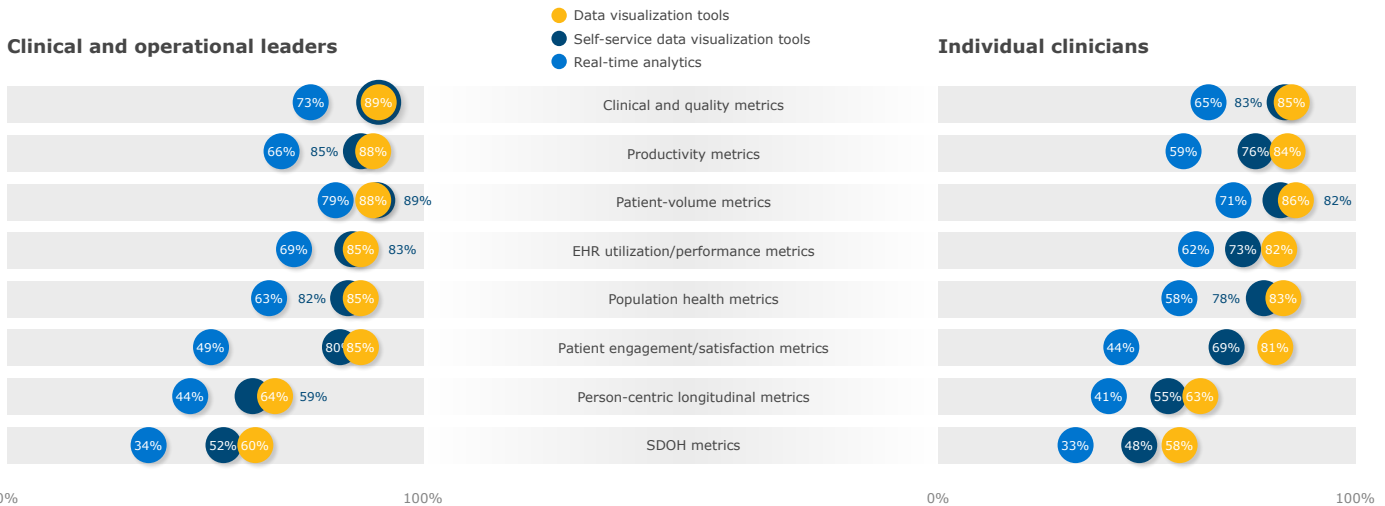| Activity	EHR only	Third-party only	Homegrown only	Combination of 2 or more tool types	N/A
Prioritized guidance on patient care gaps and statuses	37%	6%	3%	47%	7%
Quality measures and analytics at the physician level (including MIPS, MACRA, etc.)	35%	6%	1%	56%	2%
Tracking clinician usage of population health tools and activities	44%	8%	2%	35%	11%

Population Health Management (continued)

Advanced Analytics Increasingly Adopted

Adoption of advanced analytics is growing, and they are more often embedded in the clinician workflow. Certain analytics tools are more highly adopted—specifically, analytics for total cost of care (adopted by 91% of organizations) and physician-level quality measures (adopted by 98%). Tailored advanced analytics, while less adopted overall, are growing in use. For example, more acute care organizations are fully deploying embedded predictive analytics into the clinician workflow (up from 44% in 2020 to 55% in 2021). This growth is paralleled in ambulatory care organizations, though to a lesser degree (current adoption is 52%); the gap is even larger for LTPAC, where current adoption is 40%. Real-time analytics have also been increasingly adopted to deliver key metrics information to clinical and operational leaders as well as individual clinicians. The use of data-visualization tools and self-service data-visualization tools to deliver metrics information increased 3 and 8 percentage points respectively in the last year. Real-time analytics grew in adoption by an average of 15 percentage points, though it remains less adopted (by 10–20 percentage points) than other analytics tools.

Status of Embedding Predictive Analytics into Clinician Workflow

2021 (n=401)

2020 (n=421)

- Fully deployed and achieving outcomes
- Implementing or starting to use
- Looking to purchase capabilities
- Not using or planning to use in near-term future

8%
5%
32%
55%

12%
8%
36%
44%

Method by Which Key Metrics Are Delivered to Stakeholders (n=401)

- Data visualization tools
- Self-service data visualization tools
- Real-time analytics

Clinical and operational leaders

| | | Individual clinicians |

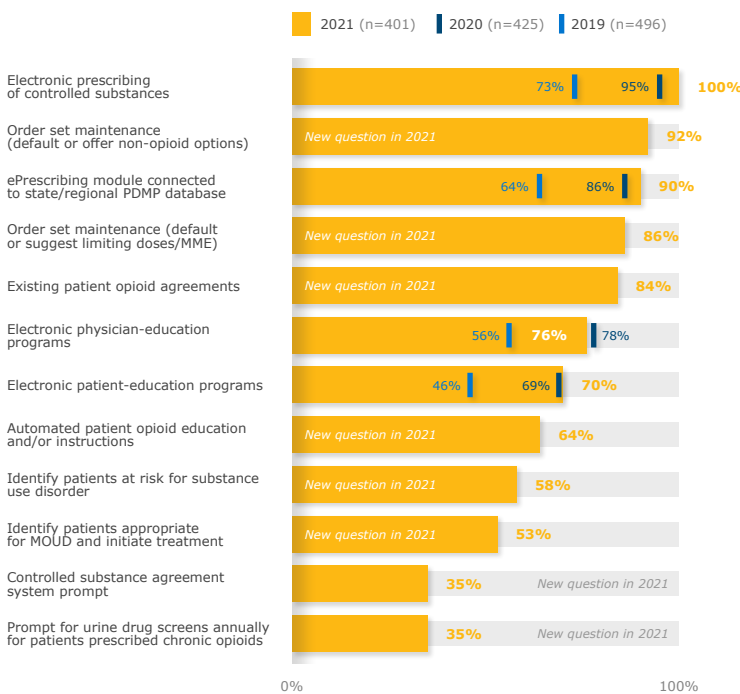| Clinical and quality metrics | Clinical and operational leaders: 73%, 89% | Individual clinicians: 65%, 83%, 85% |
Productivity metrics	66%, 85%, 88%	59%, 76%, 84%
Patient-volume metrics	79%, 88%, 89%	71%, 86%, 82%
EHR utilization/performance metrics	69%, 85%, 83%	62%, 73%, 82%
Population health metrics	63%, 82%, 85%	58%, 78%, 83%
Patient engagement/satisfaction metrics	49%, 80%, 85%	44%, 69%, 81%
Person-centric longitudinal metrics	44%, 64%, 59%	41%, 55%, 63%
SDOH metrics	34%, 52%, 60%	33%, 48%, 58%

0% — 100%

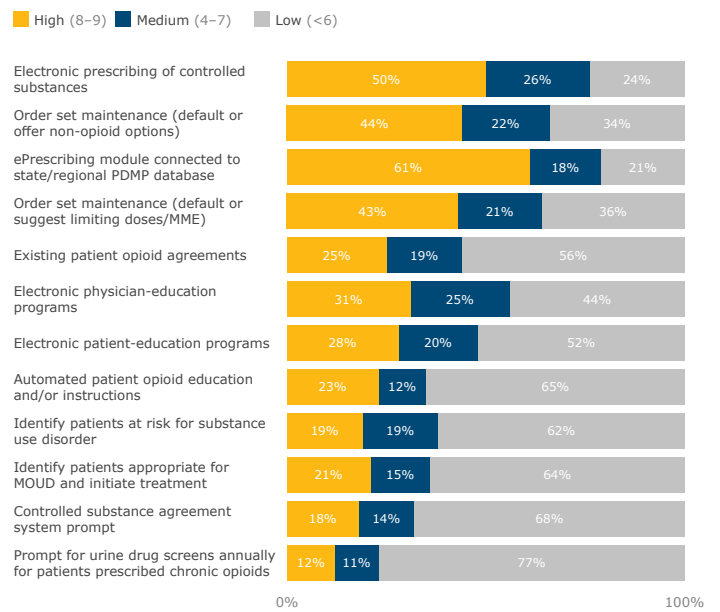0% — 100%

Opioid Management

Expansion of Opioid-Use Reduction Technology and Mechanisms

Adoption of opioid-use reduction interventions increased by an average of 20 percentage points from 2019 to 2020, but that growth slowed significantly in 2021 (up about 3 percentage points). Still, organizations are reporting a greater number of interventions in use at their organization. One-third of organizations use 10 or more of the interventions in the Most Wired survey. There is a positive correlation between the number of interventions an organization uses and the average overall impact of those interventions on reducing opioid use. Order set maintenance (multiple types) and electronic prescribing—foundational elements of any opioid-use reduction program—are some of the most adopted interventions (86%–100%). LTPAC organizations report markedly less adoption across all opioid-use reduction interventions (15 percentage points lower on average), while adoption is quite similar across acute and ambulatory care.

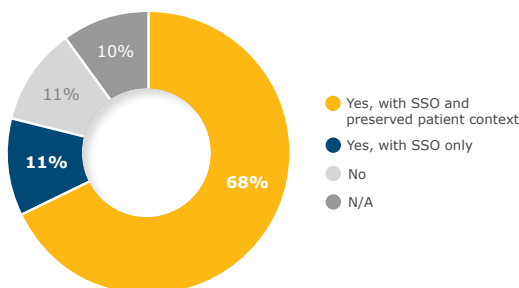### Information Technology Support and Mechanisms in Use for Opioid-Use Reduction

Legend: 2021 (n=401) 2020 (n=425) 2019 (n=496)

Intervention	2021	2020	2019
Electronic prescribing of controlled substances	100%	95%	73%
Order set maintenance (default or offer non-opioid options)	92%	New question in 2021	
ePrescribing module connected to state/regional PDMP database	90%	86%	64%
Order set maintenance (default or suggest limiting doses/MME)	86%	New question in 2021	
Existing patient opioid agreements	84%	New question in 2021	
Electronic physician-education programs	76%	78%	56%
Electronic patient-education programs	70%	69%	46%
Automated patient opioid education and/or instructions	64%	New question in 2021	
Identify patients at risk for substance use disorder	58%	New question in 2021	
Identify patients appropriate for MOUD and initiate treatment	53%	New question in 2021	
Controlled substance agreement system prompt	35%	New question in 2021	
Prompt for urine drug screens annually for patients prescribed chronic opioids	35%	New question in 2021	

Impact on Opioid-Use Reduction (n=401)

Legend: High (8–9) Medium (4–7) Low (<6)

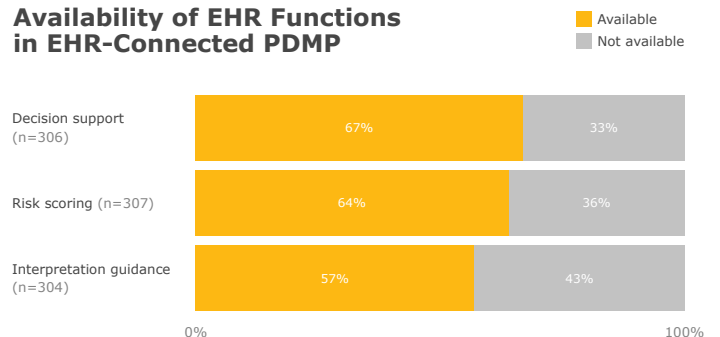| Intervention	High	Medium	Low
Electronic prescribing of controlled substances	50%	26%	24%
Order set maintenance (default or offer non-opioid options)	44%	22%	34%
ePrescribing module connected to state/regional PDMP database	61%	18%	21%
Order set maintenance (default or suggest limiting doses/MME)	43%	21%	36%
Existing patient opioid agreements	25%	19%	56%
Electronic physician-education programs	31%	25%	44%
Electronic patient-education programs	28%	20%	52%
Automated patient opioid education and/or instructions	23%	12%	65%
Identify patients at risk for substance use disorder	19%	19%	62%
Identify patients appropriate for MOUD and initiate treatment	21%	15%	64%
Controlled substance agreement system prompt	18%	14%	68%
Prompt for urine drug screens annually for patients prescribed chronic opioids	12%	11%	77%

The highest-impact intervention for opioid-use reduction is connecting the ePrescribing module with the state or regional prescription drug monitoring program (PDMP) database. Although almost all states have a statewide PDMP database, 21% of acute care organizations report clinicians can't access the PDMP directly from the EHR or that the connection doesn't apply to them (20% for ambulatory, 28% for LTPAC). Of the clinicians who have access from the EHR, 68% can connect through SSO while preserving patient context, and the remaining 11% connect through SSO only (patient context not preserved). With an EHR/PDMP connection, clinicians have easier access to more data, helping improve treatment plans.

Direct Clinician Access to PDMP through EHR (n=399)

- 68% Yes, with SSO and preserved patient context
- 11% Yes, with SSO only
- 11% No
- 10% N/A

Availability of EHR Functions in EHR-Connected PDMP

Legend: Available Not available

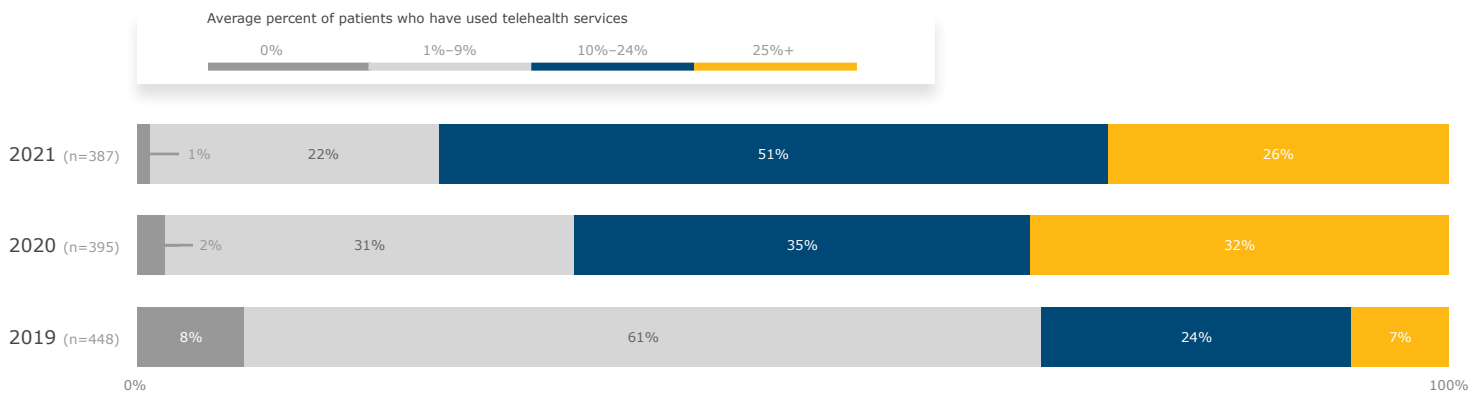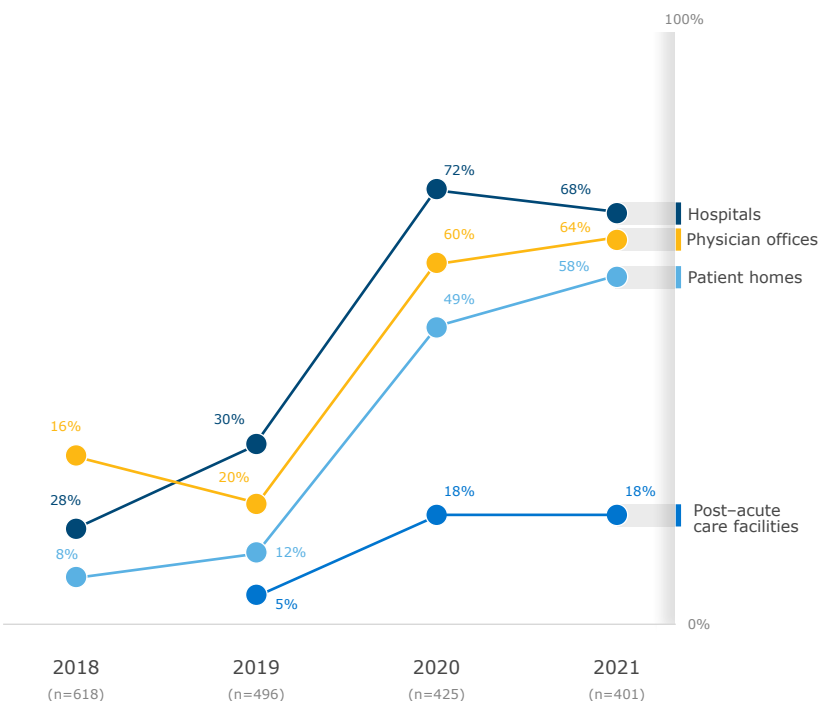| Function	Available	Not available
Decision support (n=306)	67%	33%
Risk scoring (n=307)	64%	36%
Interpretation guidance (n=304)	57%	43%

Patient Engagement

Patient Telehealth Use Stabilizes

Usage and availability of telehealth services have stabilized since 2020. 80% of acute and ambulatory care organizations report that >10% of patients have used telehealth services in the last year (68% of LTPAC organizations report the same level of usage). This represents an increase in telehealth usage overall; however, slightly fewer organizations report >25% of patients using telehealth, in contrast to the dramatic growth that occurred in this group from 2019 to 2020. The percentage of providers who have provided telemedicine is very large—one-third of ambulatory organizations say 90% of their providers have used telemedicine in their practice. 61% of organizations report having had no telehealth issues caused by broadband access limitations; 39% have encountered broadband limitations on the patient's end that prevented access to telehealth.

Telehealth Usage

Average percent of patients who have used telehealth services

| 0% | 1%–9% | 10%–24% | 25%+ |

Year				
2021 (n=387)	1%	22%	51%	26%
2020 (n=395)	2%	31%	35%	32%
2019 (n=448)	8%	61%	24%	7%

0% — 100%

Locations Where Telehealth Services Are Offered

Hospitals: 28% (2018), 30% (2019), 72% (2020), 68% (2021)
Physician offices: 16% (2018), 20% (2019), 60% (2020), 64% (2021)
Patient homes: 8% (2018), 12% (2019), 49% (2020), 58% (2021)
Post–acute care facilities: 5% (2019), 18% (2020), 18% (2021)

2018 (n=618)   2019 (n=496)   2020 (n=425)   2021 (n=401)

2020 saw a dramatic increase in the breadth of locations where telehealth services were offered (by an average of 33 percentage points). Now, more than a year after the pandemic began, that increase has slowed; across locations of service, the average growth in telehealth offerings was 2 percentage points, with the largest increase being in patients' homes (up 9 percentage points). Telehealth in post–acute care facilities continues to trail behind.

When it comes to types of telehealth services offered across locations, no service offering increased more than 9 percentage points in 2021. Most services increased by 2-4 percentage points, with a few exceptions. In the last year, stroke care telehealth has increased in use by 9 percentage points in physician offices (up to 45%) and patient homes (up to 30%); behavioral health and addiction treatment/counseling have also increased 8 percentage points in patient homes (up to 70% and 76%, respectively).
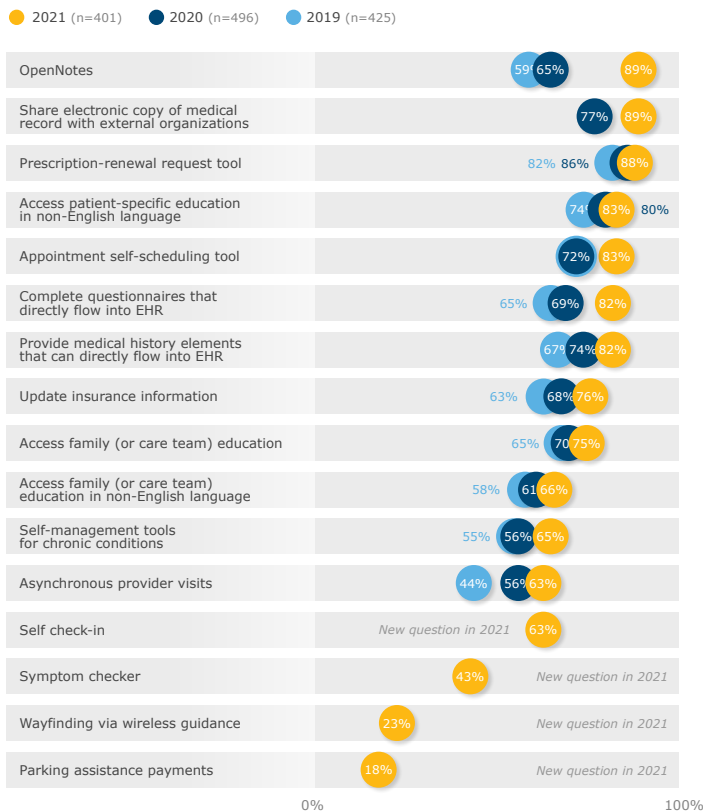
Patient Engagement
(continued)

Patient Portal and Mobile Apps Expand Capabilities

83% of acute care organizations report high use of patient portals by patients (i.e., 25%+ have accessed the portal in the last year). LTPAC organizations see similar usage levels as acute care (82% report high use), and ambulatory organizations most commonly report high patient utilization (88%). About two-thirds of acute care organizations say 40%–80% of their patients have accessed the patient portal in the last year. Three-fourths of surveyed ambulatory organizations say 40%-80% of patients have utilized their patient portal in the last year.
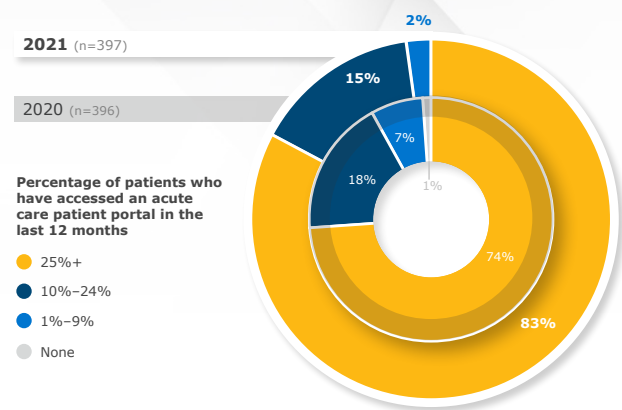
Acute and ambulatory care organizations have many portal capabilities now considered standard—for example, test results, secure messaging, and bill pay (all adopted by >90% of organizations). For acute care, average adoption growth across patient portal capabilities has nearly doubled since 2020 (up 9 percentage points in 2021 compared to 5 percentage points in 2020). Access to OpenNotes has seen the most dramatic growth in the last year (up 24 percentage points). This aligns with increasing desire from patients to have greater transparency into both healthcare costs and their own clinical care. Ambulatory organizations are about 3 percentage points higher in adoption of portal capabilities, though growth rates from 2020 to 2021 are similar across ambulatory and acute care.

Patient Access to Acute Care Patient Portal

2021 (n=397)

2020 (n=396)

Percentage of patients who have accessed an acute care patient portal in the last 12 months

- ● 25%+
- ● 10%–24%
- ● 1%–9%
- ○ None

(Outer ring: 74%, 15%, 2%, ... Inner ring: 83%, 18%, 7%, 1%)

Adoption of mobile apps for patients has grown consistently (up an average of 9 percentage points in 2020 and 2021). The mobile app capability with the greatest growth is pricing lists for various services (up 22 percentage points in 2021). The only other capabilities with double-digit growth are real-time news/blog feeds (with adoption up 10 percentage points) and electronic insurance cards (up 15 points). Adoption of mobile app capabilities is similar in ambulatory organizations. LTPAC organizations have a much bigger adoption gap—for example, for text appointment reminders and wayfinding, adoption is 18 percentage points lower in LTPAC than acute care.

Clinical Communication Capabilities Offered through Patient Portal

- ● 2021 (n=401) ● 2020 (n=496) ● 2019 (n=425)

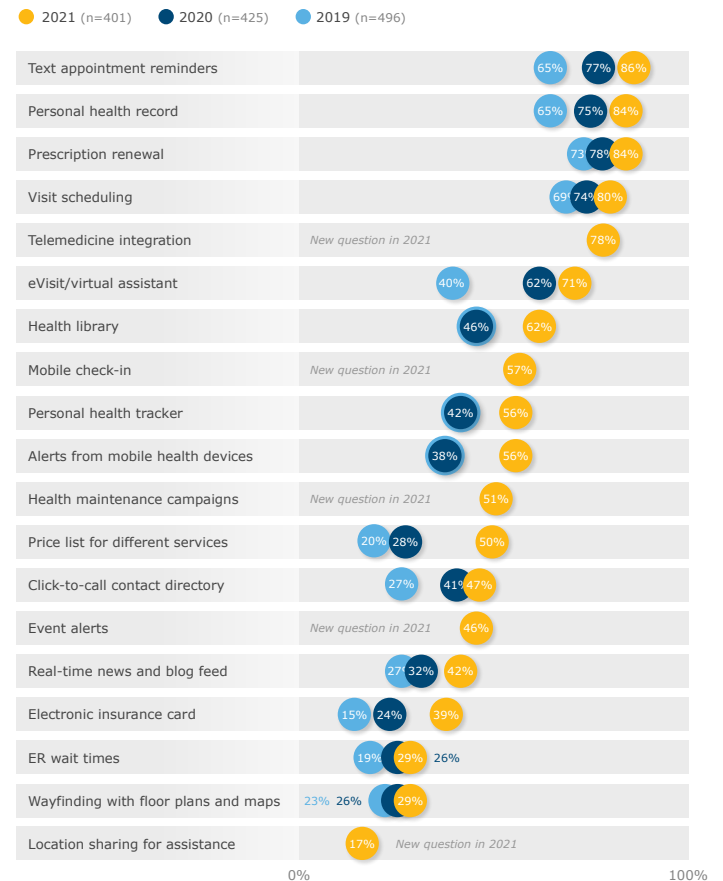| Capability	2019	2020	2021
OpenNotes	59%	65%	89%
Share electronic copy of medical record with external organizations		77%	89%
Prescription-renewal request tool	82%	86%	88%
Access patient-specific education in non-English language	74%	83%	80%
Appointment self-scheduling tool		72%	83%
Complete questionnaires that directly flow into EHR	65%	69%	82%
Provide medical history elements that can directly flow into EHR	67%	74%	82%
Update insurance information	63%	68%	76%
Access family (or care team) education	65%	70%	75%
Access family (or care team) education in non-English language	58%	61%	66%
Self-management tools for chronic conditions	55%	56%	65%
Asynchronous provider visits	44%	56%	63%
Self check-in	New question in 2021		63%
Symptom checker	43%	New question in 2021	
Wayfinding via wireless guidance	23%	New question in 2021	
Parking assistance payments	18%	New question in 2021	

0% — 100%

Note: Patient portal capabilities with >90% adoption are not shown. These include test results, visit summaries, discharge/checkout instructions, secure messaging with provider/care team, immunization records, bill payment/bill status check, access to patient-specific education, transmission of hospital admission information to another care provider, appointment reminders and access to electronic copy of medical record.

Mobile App Capabilities Offered to Patients

- ● 2021 (n=401) ● 2020 (n=425) ● 2019 (n=496)

Capability	2019	2020	2021
Text appointment reminders	65%	77%	86%
Personal health record	65%	75%	84%
Prescription renewal	73%	78%	84%
Visit scheduling	69%	74%	80%
Telemedicine integration	New question in 2021		78%
eVisit/virtual assistant	40%	62%	71%
Health library	46%	62%	
Mobile check-in	New question in 2021		57%
Personal health tracker	42%	56%	
Alerts from mobile health devices	38%	56%	
Health maintenance campaigns	New question in 2021		51%
Price list for different services	20%	28%	50%
Click-to-call contact directory	27%	41%	47%
Event alerts	New question in 2021		46%
Real-time news and blog feed	27%	32%	42%
Electronic insurance card	15%	24%	39%
ER wait times	19%	29%	26%
Wayfinding with floor plans and maps	23%	26%	29%
Location sharing for assistance	17%	New question in 2021	

0% — 100%

Note: Mobile app capabilities with >90% adoption are not shown. These include patient portal and secure messaging.

Security

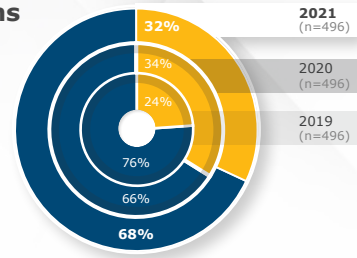## Advancing Core Components of Comprehensive Security Program

In line with industry advances, the 2021 Most Wired survey raises the standard for a comprehensive security program by updating the definitions of a few key components. Under the new standard, security progress and security deficiencies must be reported quarterly (rather than the prior requirement of annual reporting), the board must be given a security update at least semi-annually (rather than annually), and organizations must have a dedicated security leader in the executive suite (a CISO rather than a director of security). 32% of acute and ambulatory care organizations meet this new standard, and 26% of LTPAC organizations meet it.

Not including these updates to the above components, growth in adoption of individual components has remained relatively consistent from 2020 to 2021. The largest area of growth is having a dedicated security operations center (up 4 percentage points). Having a designated CISO continues to be the least adopted core component across all organization types (adopted by about 60% of acute and ambulatory care and 55% of LTPAC). Acute care organizations that have participated in the Most Wired survey before 2021 are more likely to have a CISO than new survey participants (63% versus 46%).
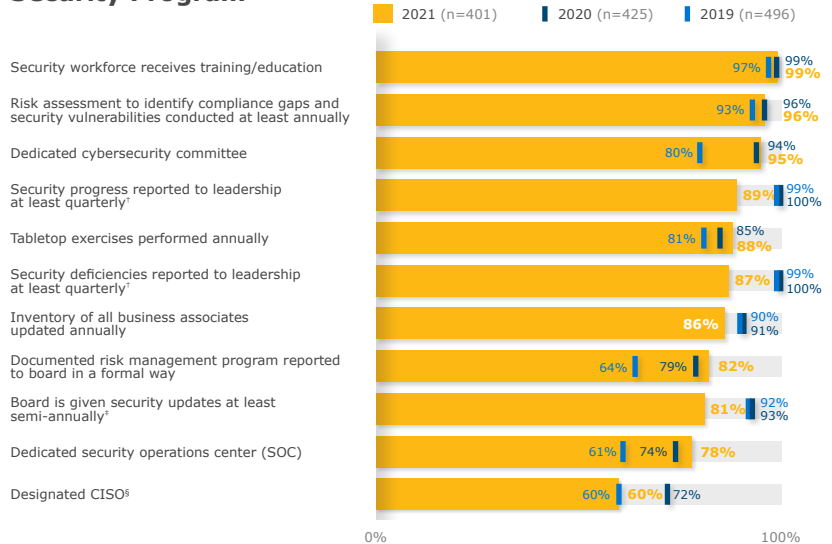
For an organization to be counted as having a comprehensive security program, they must have all the core components of a comprehensive security program (see chart below).

Percent of Organizations with a Comprehensive Security Program

- Comprehensive
- Non-comprehensive

2021 (n=496): 32% Comprehensive, 68% Non-comprehensive
2020 (n=496): 34% Comprehensive, 66% Non-comprehensive
2019 (n=496): 24% Comprehensive, 76% Non-comprehensive

Adoption of Core Components of a Comprehensive Security Program

2021 (n=401) 2020 (n=425) 2019 (n=496)

Component	2021	2020	2019
Security workforce receives training/education	97%	99%	99%
Risk assessment to identify compliance gaps and security vulnerabilities conducted at least annually	93%	96%	96%
Dedicated cybersecurity committee	80%	94%	95%
Security progress reported to leadership at least quarterly†	89%	99%	100%
Tabletop exercises performed annually	81%	85%	88%
Security deficiencies reported to leadership at least quarterly†	87%	99%	100%
Inventory of all business associates updated annually	86%	90%	91%
Documented risk management program reported to board in a formal way	64%	79%	82%
Board is given security updates at least semi-annually‡	81%	92%	93%
Dedicated security operations center (SOC)	61%	74%	78%
Designated CISO§	60%	60%	72%

0%   100%

† This component was updated in 2021. Percentages for 2019 and 2020 reflect the prior *annual* requirement, while percentages for 2021 reflect the new *quarterly* requirement.

‡ This component was updated in 2021. Percentages for 2019 and 2020 reflect the prior *annual* requirement, while percentages for 2021 reflect the new *semi-annual* requirement.

§ This component was updated in 2021. Percentages for 2019 and 2020 reflect the prior requirement for a designated director of security *or* CISO, while percentages for 2021 reflect the new requirement for a designated CISO.

Technology-Focused Security Measures Are Most Adopted

Despite the challenges of COVID-19, about 80% of acute and ambulatory care organizations (and 82% of LTPAC) say their ability to respond to or plan for emergent cybersecurity threats was not hindered by the pandemic. However, that leaves 1 in 5 organizations with increased vulnerabilities.

In 2021, CHIME raised the standard for a comprehensive security program, yet year-over-year growth in the adoption of non-core security measures by comprehensive and non-comprehensive organizations still occurred. Security measures that include people and processes (i.e., testing recovery plan, purple team exercises, social engineering risk assessment) continue to have the least adoption compared to technology-focused security measures. Security measures that have seen the most growth (up 10–13 percentage points) for both comprehensive and non-comprehensive organizations include adaptive/risk-based authentication for network access, medical device security tools and next-generation endpoint protection systems.

Amid growing cybersecurity threats, the application of Purple Team Exercises (added to the Most Wired survey in 2021) has become increasingly critical—these are exercises where a blue team (defenders) and a red team (attackers) are brought together to simulate security threats. While annual Purple Team Exercises are the least-adopted measure across organization types, they can significantly improve an organization's security posture.

Adoption of Security Measures

- Organizations with comprehensive security program (n=130)
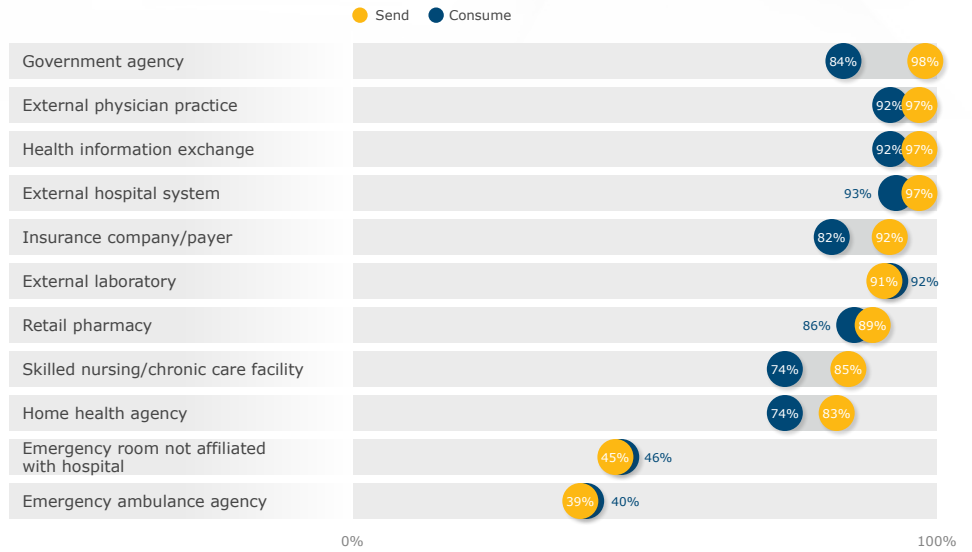- Organizations without comprehensive security program (n=271)

Technology

Measure	Without	With
Secure system baseline images	76%	94%
Inventory of authorized medical devices	75%	92%
Next-generation endpoint protection systems	76%	91%
Anomalous network monitoring and analysis	66%	87%
Automated user-access provisioning systems	63%	87%
Governance, risk, and compliance (GRC) systems	57%	82%
PKI/digital signature systems	60%	81%
Medical device security tools	50%	79%
Network access control—enforcement of devices joining network	69%	74%
Adaptive/risk-based authentication for network access	39%	65%

People & process

Measure	Without	With
Testing recovery plan (all tiers) performed at least annually	56%	58%
Purple team exercises performed at least annually	24%	45%
Social engineering risk assessment performed at least quarterly	23%	32%

0%   100%

Other Findings

Discrete Data Is More Commonly Sent Than Consumed

In general, more organizations can send discrete data to external entities than consume it from them. The few entities that are exceptions are external laboratories, unaffiliated emergency rooms and emergency ambulance agencies. The outside entities with the biggest gaps in their ability to send versus consume data are government agencies (about 13 percentage points across organization types), skilled nursing/chronic care facilities (about 11 points) and insurance companies/payers (about 9 points). As these gaps narrow and more organizations exchange discrete data, patient care will be improved as a result of reduced duplications and enhanced longitudinal care records.

Sending and Consuming Discrete Data with External Entitites (n=401)

● Send   ● Consume

Entity		
Government agency	84%	98%
External physician practice	92%	97%
Health information exchange	92%	97%
External hospital system	93%	97%
Insurance company/payer	82%	92%
External laboratory	91%	92%
Retail pharmacy	86%	89%
Skilled nursing/chronic care facility	74%	85%
Home health agency	74%	83%
Emergency room not affiliated with hospital	45%	46%
Emergency ambulance agency	39%	40%

0%   100%

Barcode Adoption Continues to Outpace Slow-Growing RFID

Across all organization types, barcoding continues to be the primary method healthcare organizations use to track and identify patients, staff and assets. This is largely because of the existing barcoding infrastructure and the potentially prohibitive up-front costs of establishing an RFID system and RFID tags. However, RFID usage is growing. For acute care organizations, the four most widely adopted RFID tracking/identity management use cases also experienced the biggest year-over-year growth—adoption of movable equipment increased 9 percentage points, and patient tracking, staff tracking and staff ID went up 7 points each. These same areas saw the biggest year-over-year growth for barcode-tracking use as well. There are only two tracking/identity management use cases where RFID is leveraged more frequently than barcoding: staff tracking (by 7 percentage points) and hand hygiene (by 2 points). These are also the two least-adopted use cases for barcoding across organization types.

Barcode and RFID Usage for Tracking/Identifying— by Item or Activity

2021 (n=401)
2020 (n=425)

Barcode use: ● 2021 ● 2020
RFID use: ● 2021 ● 2020

Patient ID
Medication (unit dose)
Medication (bulk)
Blood supply
Surgical supplies
Medical supplies
Staff ID
Movable equipment
Human milk
Patient tracking
Staff tracking
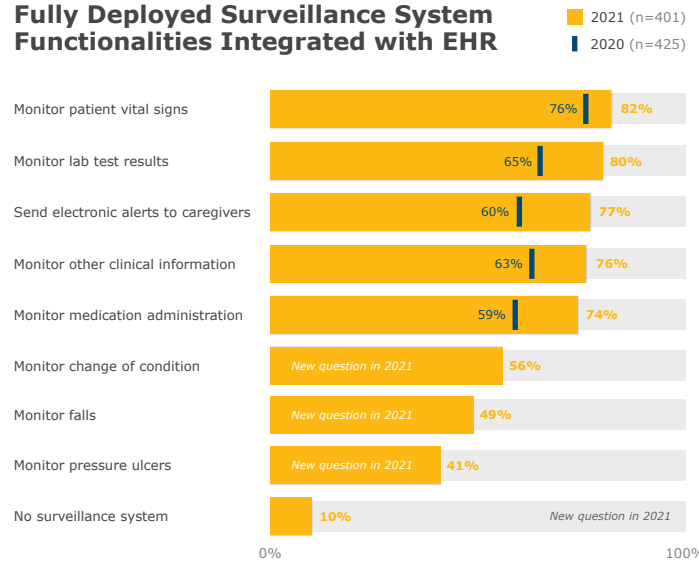Hand hygiene

0%   20%   40%   60%   80%   100%
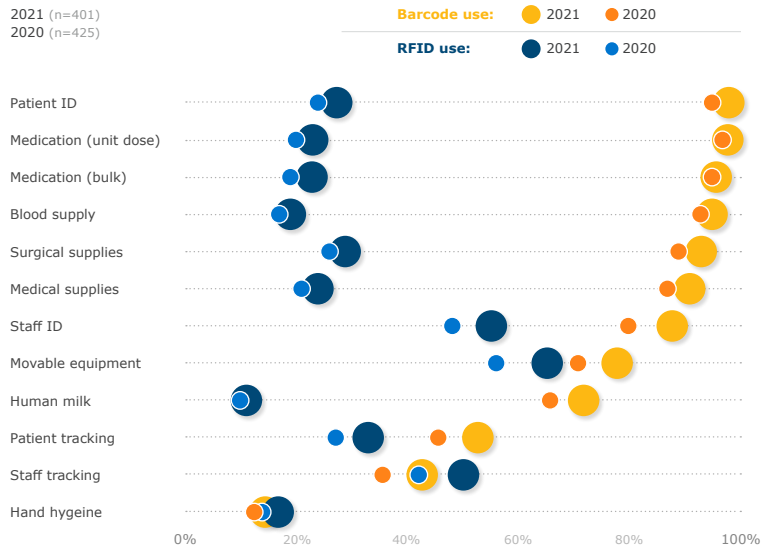
Increased Adoption and Advancement of Surveillance Systems

The percentage of organizations with EHR-integrated surveillance systems has grown each year the question has appeared in the Most Wired survey—from 71% (2019), to 82% (2020), to 90% (2021). Surveillance systems are less often adopted by LTPAC organizations (74%), but adoption is growing (up 5 percentage points since 2020). For acute care organizations, alerts to critical care units are consistently the data type most frequently sent from surveillance systems (by 85% of acute care organizations in 2021); this has been especially critical during the pandemic. Due to industry advancement and increased importance placed on surveillance, the 2021 Most Wired survey asked about some additional functionalities and whether they are fully deployed within an EHR-integrated surveillance system. Monitoring of patient vital signs (historically adopted at high rates) grew the least, by 6 percentage points. Other components saw more than double that rate of growth—for example, sending electronic alerts to caregivers (up 17 percentage points), monitoring lab test results (up 15 points) and medication administration (up 15 points). In the LTPAC space, adoption of surveillance functionalities increased more slowly—on average, by about 6 percentage points across functionalities.

Types of Clinical Alerts Sent from EHR-Integrated Surveillance System
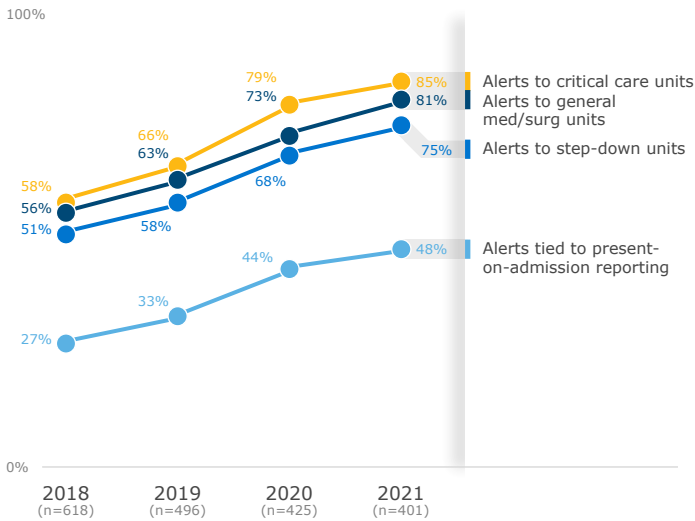
Fully Deployed Surveillance System Functionalities Integrated with EHR