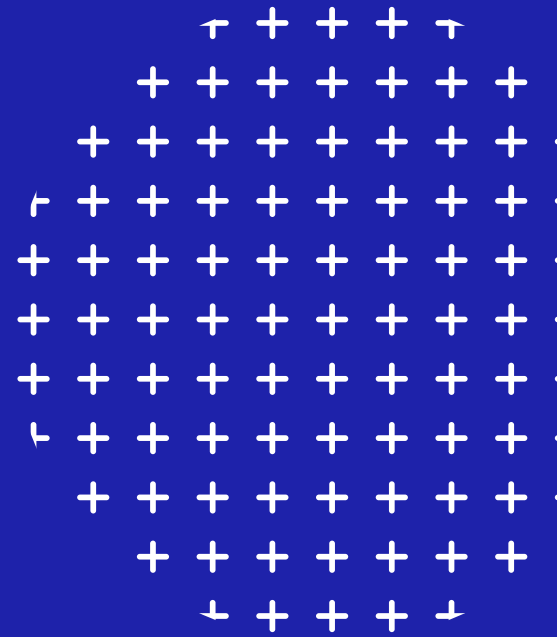




HIMSS™



APAC Health CIO Report 2021:

5 Actionable Insights





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Introduction

We have compiled a list of five key digital healthcare trends in Asia-Pacific (APAC) for this report inspired by the shared insights and best practices which were revealed at the HIMSS APAC Health CIO Summit in July 2021; APAC's first gathering of 120 health CIOs or their equivalents. At the inaugural meeting, APAC healthcare chiefs shared their key digital priorities for cybersecurity, connected health, analytics, automation, and digital literacy in the region. We also polled the conference attendees to find out what their digital priorities and aspirations were and have included these results in this report.

During this ground-breaking summit, digital health experts from around the world described how COVID-19 has transformed the way care is being delivered, rapidly accelerating the deployment of digital technology in APAC. They said that cybercrime has rocketed in the region in the wake of COVID-19 and that cybersecurity is now a priority. They explained how cybercriminals gain access to systems, which devices are vulnerable to cyberattacks, why legacy systems can be breached and the best ways to optimise cybersecurity.

They discussed connected health and told the conference how it has been used to maximise resources and limit the spread of the virus in the region. They revealed that AI has become so sophisticated that it can now, for example, differentiate Coronavirus from other viruses in patients' lungs. They explained how automation is being used to improve workflows in Intensive Care and why the APAC region is expected to emerge as a hub for automation excellence.

Additionally, there were discussions about how the culture around healthcare has changed. Fifty-seven per cent of the world's population are online today and connectivity has evolved to create a much more empowered consumer. Patients now understand so much more about what technology can do for them and how technology can be harnessed to provide healthcare. They can now access virtual GP consultations from their own homes or use an increasing array of apps to become more active participants in their own healthcare.

The role of the health CIO has also concurrently evolved substantially in the last ten years, with CIOs now being required to understand a wide variety of aspects of healthcare management. They have had to become agents of digital transformation, with healthcare delivery companies now looking at candidates who specialise in areas beyond informatics, workflows, systems and architecture. Responsibilities may now include oversight in strategy, projections, marketing, and patient experience, to name a few.

COVID-19 has most definitely super-charged the implementation of digital technology and there is no going back. The pandemic has shown that digital technology can enhance quality of care, improve patient outcomes, reduce re-admissions, and lower costs, which are important priorities for all healthcare organisations. APAC seems to be leading the field in digital transformation, so it is perhaps even more important for healthcare organisations here not to get left behind. We hope the key insights and best practices contained in this report will help you make the right choices when it comes to implementing your digital strategies.

Investment in cybersecurity is needed as cybercrime is skyrocketing

Cyberattacks are continuing to rise in APAC and healthcare organisations are being increasingly targeted in ransomware attacks or data breaches, putting patient safety at risk and costing large sums of money, according to healthcare leaders.

Maintaining data privacy in healthcare is a major issue, especially with the accelerated digitisation brought about by the pandemic. Cybercriminals are now targeting medical data bases to access lucrative personal health data. Legacy systems are considered a soft touch, so older systems are at greater risk of cyberattack.

There has been a number of cyberattacks against healthcare organisations in APAC since the pandemic began, ranging from the major ransomware attack on Waikato District Health Board in New Zealand in May 2021, which seriously impacted services, forcing staff to introduce a manual recording process across their hospitals, to the attack on Eastern Health in Australia where less urgent surgeries were postponed in four hospitals and two health centres.

Additionally, there was a patient data leak in the Tasmanian Ambulance Service, which revealed the HIV status of ambulance patients; a cyberattack on the Eye and Retina Surgeons Clinic in Singapore, which exposed the healthcare data of 73,000 patients; cyberattacks on Saraburi Hospital and other government hospitals in Thailand; and a surge of ransomware attacks in South Korea, which shut hospitals and shopping malls alike. And these are only the incidents which have been revealed.

According to research from the Australian Cyber Security Centre (ACSC), ransomware attacks in Australia increased by 15% between July 2020 and June 2021 and cybercrime losses cost the country at least \$33 billion. The latest [ACSC report](#) which was published in September 2021, blames malicious cyber actors, for exploiting the COVID-19 pandemic and targeting vulnerable Australians and health services, to steal money and sensitive data.

The report said:

“Targeting of the health sector, particularly by cybercriminals, is one of the most significant cyber threats Australia has so far faced during the pandemic. The health sector in Australia reported the second highest number of cyber security incidents both overall and for ransomware-related cyber security incidents.”

The World Health Organisation has also reported a five-fold increase in cyberattacks since the start of the COVID-19 pandemic and an Interpol assessment of the impact of COVID-19 on cybersecurity reveals that there has been a shift from hacking individuals to targeting government and critical health infrastructures instead.

A [global survey](#) by cybersecurity firm Sophos and Tech Research Asia of nine hundred business decision makers across APAC found that nearly 70% of APAC organisations surveyed suffered a data

breach in 2020, an increase of 36% from 2019.

Such attacks can compromise patient safety, and are extremely expensive for healthcare organisations. A [study](#) by the research and consulting firm Frost and Sullivan which was commissioned by Microsoft at the start of the pandemic, estimated the average economic cost of a cyberattack on a large healthcare organisation in APAC incurred an average of 23.3 million US dollars loss from a security incident because of customer disruption and customer loss, remediation costs, fines, productivity loss and reduced share price.

As new viruses and hacking techniques evolve, legacy systems can become more vulnerable to cyberattacks. According to the [Forescout Device Cloud Report](#), most common devices operate on legacy systems and there are growing vulnerabilities in operational technology environments. Medical devices, such as imaging systems, syringe infusion pumps, pacemakers and patient monitors are all vulnerable to hacking.

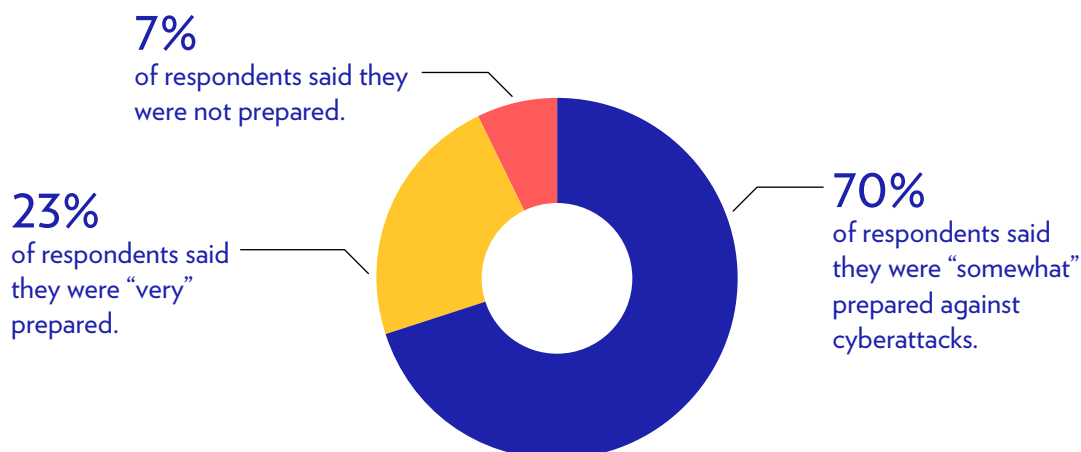
The report said that the diversity of device vendors and operating systems on medical networks added to the security challenge. It found that 40% of healthcare deployment had more than twenty different operating systems.

As healthcare organisations tend to prioritise medical care, they sometimes choose to update existing software, rather than invest in new systems, but this can be more expensive in the long run. The largest known ransomware attack so far was against the Health Service Executive of Ireland in May 2021 when its IT systems nationwide were all blocked.

While many healthcare organisations in APAC are ramping up cybersecurity to counter evolving threats, 70% of the health leaders at the HIMSS APAC Health CIO Summit said they were only “somewhat prepared” for cyberattacks and more than three quarters said they were still running on legacy systems or infrastructure.

Poll results

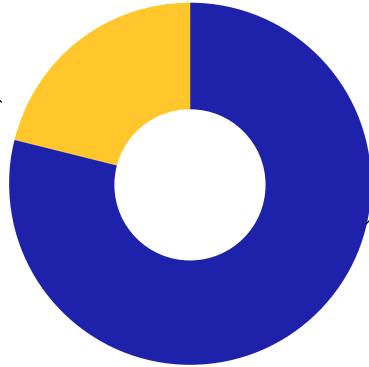
HIMSS asked “How prepared is your organisation against cyberattacks?”



HIMSS also asked: “Is your organisation running on legacy systems/infrastructure?”

21%

of respondents said they were not running legacy systems or infrastructure



79%

of respondents said their organisations were running on legacy systems or infrastructure.

Expert opinions



Lee Kim,

Director of Privacy and Security at HIMSS North America, shared that very aggressive cyberattacks and breaches were now leading to significant ransomware attacks:

“ We are seeing more and more, so many cyberattacks, attacking our hospitals and attacking many services that are critical to sustaining life and society. So, unfortunately, this is very much an everyday thing.”

She said that most ransomware comes in through phishing emails or scam emails – when someone clicks on a malicious link or an attachment, activating a malicious code or downloading one from the web. This then attacks their system, and if their network is not segmented, malware can easily traverse the network to infect other systems.



Christopher Neal,

Chief Information Security Officer at Ramsay Health Care, warned that cybercriminals are becoming more sophisticated:

“ Cybercriminals are starting to attack perimeter network devices, perimeter security devices. Vulnerabilities announced in the last six months in SonicWall, and Cisco, and Citrix, and others, and they’re starting to attack those. They’re continuing to look for, and getting more success with, looking for systems with remote desktop protocol open to the internet and attacking those and using those as a foothold into the organisation.”

While Kim appreciates that cybersecurity budgets are small, she urges everyone to invest in endpoint detection and response systems that use AI to thwart viruses and malware. She also suggests that healthcare organisations consider using a bug bounty programme where so-called white hat hackers, or ethical hackers, examine systems to see where networks can be compromised. Zero-day vulnerabilities can then be reported to the manufacturers so they can address them right away and issue a patch before attackers can take advantage.

According to Neal, cyber hygiene is vital: “Know what you have, know what’s on your network, know what’s out there. Keep it up to date, keep it patched, keep it current, back it up. Make sure you have working backups and you can restore your systems in the event of an incident. Manage access; hold people accountable. Understand what is important, what’s there and how you’re actually measuring. Are you doing the right things? Know what you have, by that I mean, know what’s actually connected to your network. What are the key critical systems? And who’s accountable for them.

Any organisation larger than 200-300 people will probably need tooling or some systems to understand what’s there. What’s on your network? What’s being added? What’s being removed? Where is it moving? Again, are they in a data centre? Are the systems in the cloud? Are they under someone’s desk? And where there are critical systems; what data is held and who has access to them? But understanding that in totality.”

Neal believes that keeping software up to date is critical. He said Ramsay Health Care aimed to have at least 99% of their workstations on the latest software versions. He added that they spent time removing legacy system such as Windows XP.

Kim explained why unsupported legacy operating systems like these can be hazardous: “The reason why these are bad is because once you have such legacy software, an attacker can easily connect your system through remote means and, essentially, get a remote shell on your machine and issue just about any kind of command he or she wants. It’s fairly trivial with these unsupported systems to also elevate your access, so that you essentially get elevated administrator privileges and such.”

“ One of the early things we did was implement Microsoft’s local admin password solution. But what that does is it goes through and randomises the local admin password on every PC connected to your domain and lets a domain administrator, or someone with privileged access, look up that password when needed, and will then reset it whenever it’s used. More generally, those users don’t need a local admin. I have yet to see an environment where the users actually need local admin, many will want it, many will complain about losing it, but they truly don’t need it. And if you can remove local admin from users, you’ve immediately reduced your attack surface,” remarked Neal.

He mentioned that organisations had to recognise that downtime was vital to security, and he said planned downtime was much better than unplanned downtime due to ransomware because the system was unpatched. He said if PCs and the broader ecosystem were not backed up, there could be problems: “There was a hospital group in Australia which was attacked in April, whose ransomware took over most of their environment. They had fairly poor backup, unfortunately, and they were without key IT systems for over six weeks... half a dozen hospitals literally using pen and paper because the systems weren’t there.”

Kim urged everyone to carry out a review of all computerised hospital equipment: “In terms of a call to action for you in the industry, I especially advise that our equipment within hospitals, such as elevators, escalators, even things that aren’t computer systems, that are computerised, may be run by your Facilities Department, please do make sure that your facilities’ individuals meet with your IT security individuals, so that all these devices are secured and protected.

If there’s a patient that is on a smart elevator, for example, and they need to be wheeled to surgery, but if the elevators are not working, their life will be in danger. So, again, we do all of this out of respect for the patient and in light of the number one priority of protecting patient safety and patient lives. Being in the healthcare industry, we also must increase the frequency of patching our systems especially for critical and very severe vulnerabilities. The reason is that the longer it takes to patch a vulnerability, the longer the window of time is for attackers to break into your system. And that we don’t want.”

Main takeaways

As the threat from cybercriminals is growing, it is advisable to:

- Alert your healthcare organisation to the growing importance of cybersecurity.
- Review your cybersecurity arrangements and make sure they are up to date.
- Purchase new software or make sure existing systems are adequately patched, possibly deploying a bug bounty programme.
- Invest in endpoint detection and response systems that use AI to thwart viruses and malware.
- Implement a local administrative password solution.
- Ensure that systems are backed up and can be restored in the event of an incident.
- Review all hospital equipment which is computerised and ensure the Facilities Department discusses cybersecurity requirements with the IT Department.

Connected health models ensure better health management

The pandemic has supercharged digital healthcare globally, driving the deployment of connected care delivery models such as video conferencing and remote monitoring, as well as spawning a multitude of health apps.

Connected health has been rapidly deployed throughout APAC to maximise resources and limit the spread of the virus. Internet-based services are reported to have soared since the pandemic began with cities like Bangalore [reporting](#) a 100% increase in internet traffic.

The Australian Federal Government responded to the challenge of COVID-19 by expanding access to its telehealth services; Chinese hospitals introduced wearable sensors to provide continuous temperature readings for patients; and the Singapore government launched TraceTogether, a community-driven contact tracing mobile app, to record signals from other devices nearby.

A range of apps has been developed to offer health and lifestyle advice too. This has led healthcare organisations to work on care delivery models that support and enable self-management of health and wellness, with provider teams guiding and informing patients' decision-making. There are fitness watches, sleep monitors, lifestyle monitoring apps, blood pressure control technologies and wearable glucose monitors to ensure that diabetic patients can keep track of their blood sugar levels.

Apps for monitoring diabetes are becoming more widely used in the APAC region as cases of the disease surge. According to the [EU-ASEAN Business Council](#), more than 138.2 million people are now living with diabetes in the Western Pacific, and the number may rise to 201.8 million by 2035.

Connected healthcare tools are increasingly being used for the improvement of both physical and mental health. Anxiety and depression have been exacerbated by COVID-19 and the World Health Organisation commented that even though there was increasing demand for services in the South-East Asia Region, critical mental health services had been disrupted or halted. The organisation [said](#) 39% of all suicides which take place globally each year, happen in this region and this is the leading cause of death among people aged 15 -29.

According to Dr Robert Morris, Chief Technology Strategist for the Ministry of Health Transformation in Singapore, “huge strides” have been made in mental health using telemonitoring, which up until recently, was primarily used around hypertension and diabetes management. He said COVID-19 had aggravated latent anxiety and depression and there was now an electronic solution called Mindline.sg, which offered “a degree of therapy” and provided connections to human-based services by phone or in person.

He said that two different approaches were used within the programme, depending on the extent of the problem:

“ If you can't sleep, you can find sleep exercises. If you feel okay, but you're just a bit lost, you can do gratitude exercises, etc. And we found this is quite effective. It does contain a chatbot and AI chatbot, which is quite fun to interact with and can help you reframe and reformulate issues like relationship issues or stress issues.

One is for serious mental illness, for psychosis. And that, of course, is much more serious and the patients that we treat with that have been recently discharged from a psychiatric hospitalisation. So, we use digital phenotyping for that... That's much more exploratory, we're not totally sure that's going to work. But we're doing a clinical trial on that.”

While there's still a shortage of evidence around the efficacy of such approaches to mental health, Dr Morris said they get 60-70% approval ratings for this solution and people do feel that these services help.

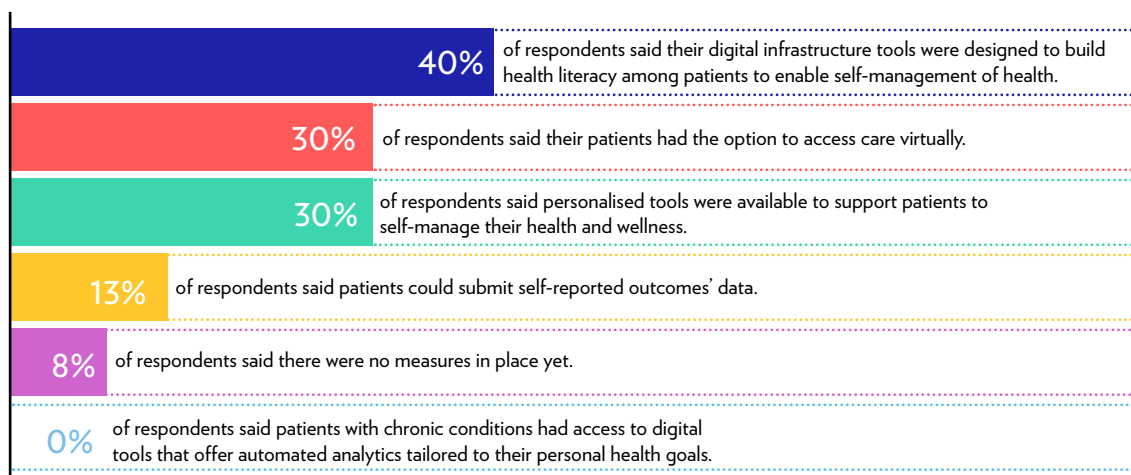
There is now significant evidence to suggest that telehealth interventions can work on physical problems, reducing chronic risk factors for those with cardiovascular disease, high blood pressure, diabetes, HIV infection, renal disease, asthma and obesity. According to the research, telehealth can improve medication adherence, clinical outcomes and dietary outcomes in these patients.

And the use of digital health apps for diabetes prevention, diabetes, asthma, cardiac rehabilitation and pulmonary rehabilitation has been shown to reduce care utilisation, saving the US healthcare system an estimated seven billion dollars a year. The IQVIA Institute for Human Data Science said if this level of savings could be extrapolated across total national health expenditure, annual cost savings of \$46 billion could be achieved.

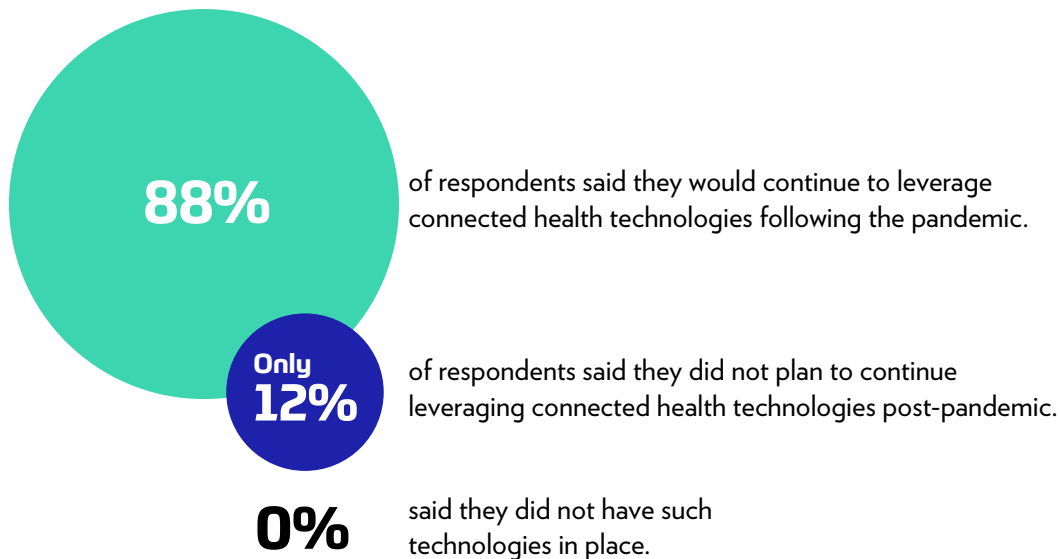
A poll at the HIMSS APAC Health CIO Summit identified the top ways connected health tools are being used in the region and revealed that most organisations will continue to use the connected health technologies which were deployed in the pandemic. This indicates that connected health is here to stay.

Poll results

HIMSS asked: “With regard to connected health technologies, which of the following measures does your organisation have in place?”



HIMSS also asked: “If you have connected health technologies in place currently, do you have plans to continue leveraging them post-pandemic?”



Expert opinions



“ We are trying to create a universe where both citizens and healthcare professionals can work and meet together, and where you can have access to all the relevant information. And by that, empowering the citizens to be an active player in their own health,”

said Claus Pedersen,

Director of the Sentinel Unit in Denmark, in reference to the Danish national healthcare portal Sundhed.dk, which encourages health self-management.

Pedersen said their portal offers the chance for patients to consult clinicians and access various services. Patients can retrieve their COVID-19 test results on the platform, access their records, view their appointments and connect with personalised services such as rehabilitation and online videos. According to Pedersen, the Danish healthcare portal has now been installed in 4.2 million mobile phones in Denmark, which means that nearly every adult in the country has the healthcare portal.



“ If you look at the over 10,000 health applications online, it’s exceptionally clear that people are driven to self-manage their health and wellness. They use online tools and apps and health services of a wide range; sleep, meditation, fitness apps, healthy eating apps, are all exceptionally widely adopted in virtually every country,”

said Anne Snowden,
Chief Scientific Research officer at HIMSS.

According to Snowden, 57% of the world’s population are online today and connectivity has evolved to create a much more empowered consumer. However, she thinks that health systems could do more to embrace self-managing health and wellness apps, and that healthcare organisations should measure the value, impact and outcomes of virtual visits.

Pedersen commented that he had learnt an important lesson about connected health recently when it was discovered that geriatric patients had been left in limbo between the homecare organisations, the GPs and the hospitals. He said they were now trying to create a comprehensive service that used the acute community nurses, digitally connected to GPS and specialists at the hospital, to enhance their capacity and take care of the elderly in their own home.

He went on to say they carried out a pilot project that changed the workflow, supported by technology, and realised that they were able to reduce the number of acute admissions for frail elderly patients by around 10%. They are now scaling this project up.

Pedersen added the Danish healthcare system, which is paid for through tax and is free to access, was now focusing on ways to improve the use and uptake of technology using AI and data. For example, they are developing robotic technology to take over manual labour. They are also trying to connect the citizens to the healthcare system in different ways and are working with precision medicine to increase the capacity of the services.



Kevin Chan,
Head of Presales ASEAN at Citrix, said their company was able to help set up an emergency hospital within a week for Mass General Brigham in the US by using digital technology flexibly and not tying themselves down to a particular device or PC:

“ They actually deployed thousands of Raspberry Pi devices in these tents that they set up, which was phenomenal! Just over the course of five days, they had a full running hospital up, using Raspberry Pi devices connected back to their Citrix workspace environment... And likewise, they were able to tear that down as soon as they needed to, and reduce that capacity, when that situation became more controlled.”



“ It may seem obvious, but you really need to have a succinct vision for connected health. So, when you embark on this journey, you’ll need to provide and enable different capabilities for all the connected systems, which sometimes can mean deploying different technologies, looking at different architectures, modernising applications, and overall looking at new approaches to IT,”

advised Franco Poldi,
Manager, Presales Southern Region ANZ at Citrix.

Poldi added that it was important to focus on security first when implementing change, and then consider AI and ML, with digitisation of patient records, and the collection of data from different sources, like IoT sensors, real-time patient data and research data, and making use of that data in a meaningful way. He said that the final consideration had to be the end user experience: the clinicians, staff, and patients.

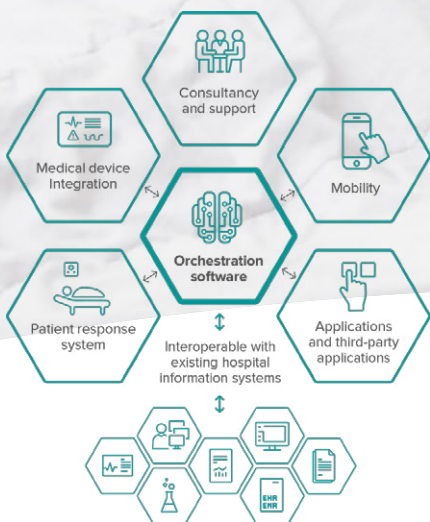
Snowdon said she would like to connect virtual care delivery services, which were created when the pandemic struck, to health system clinical documentation and information systems like EHRs. She also stated that she wanted to connect health teams across health systems and achieve greater connectivity across global health systems as there were many countries who did exceptionally well during the pandemic, compared to some others, who didn’t do well at all.

She asked: “How do we create that connected learning platform globally, so that every global citizen has the opportunity to access care when and where it’s needed, and they’re able to access the best available care, so we have equity across the global health system worldwide?”

Main takeaways

As connected health is here to stay, it is advisable to:

- Recognise that health apps are now being widely used and are empowering consumers, so healthcare systems should fully embrace the self-management of health.
- Monitor the value, impact and outcomes of virtual visits, compared to in-person visits.
- Carry out pilot projects to see whether it is possible to make improvements by changing workflows. For example, the pilot project in Denmark, which was mentioned in the text above, showed that it was possible to reduce the number of acute admissions for frail elderly patients by around 10% by changing the workflow of acute technology-supported community nurses.
- Understand that when you are implementing connected health, you need to provide and enable different capabilities for all the connected systems, which means deploying different technologies, exploring different architectures, modernising applications, and looking at new approaches to IT.
- Engage clinicians as part of your digital transformation.
- Focus on security first when implementing change.



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Analytics is key for optimal healthcare delivery

The collection and analysis of big data is fast becoming one of the main drivers in modern medicine. Analytics mines data to provide actionable insights, enabling healthcare organisations to base their decision-making on evidence or projected calculations.

“AI is getting increasingly sophisticated at doing what humans do, but more efficiently, more quickly and at a lower cost. The potential for both AI and robotics in healthcare is vast,” said a [recent report](#) by multinational professional services’ network PwC.

Analytics can now help co-ordinate care teams, improve patient outcomes and reduce hospital re-admissions and mortality rates. It can also carry out genomic sequencing, implement advanced image recognition, enable the early diagnosis of COVID-19, simulate disease outbreaks and perform infectious disease modelling.

For these reasons analytics has been a powerful ally for healthcare organisations in the pandemic and many APAC countries have been quick to deploy this technology to fight COVID-19. For example, Taiwan helped limit the spread of the virus by monitoring travellers from Wuhan and integrating immigration records with the National Insurance Database to track infections, while China used cloud-based scans and AI-assisted technology to detect and differentiate pneumonia caused by COVID-19.

According to the China News Service, the tech billionaire and co-chair of the UN High-level Panel on Digital Cooperation Jack Ma commented on technology’s ability to quickly detect disease when his holographic image addressed the World Artificial Intelligence Conference. They quoted him as saying:

“ It usually takes 15 to 20 minutes for a doctor to review CT images of a suspected COVID-19 patient. But now it takes only 20 seconds for a machine to analyse these CT images, 60 times more efficient than doctors.”

Analytics, which includes all types of data analysis, including statistical analysis and ML, can accelerate processes. Real-time analytics, as the name suggests, provides up-to-date continuous information using sensor-driven technology and streaming tools. Predictive analytics can help forecast future events, patterns and potential outcomes. Comparative analytics compares processes, documents and data sets, and conversational analytics can convert data into speech using chatbots. Prescriptive analytics informs healthcare professionals about how they can optimise clinical pathways.

Prescriptive analytics is used in Clinical Decision Support (CDS) systems, and it can analyse data within EHRs. The US National Coordinator for Health IT [said](#) CDS can significantly impact improvements in quality, safety, efficiency, and effectiveness of health care.

Analytics uses a range of smart tools such as healthcare analytics and cloud-based solutions to marshal vast amounts of data. AI solutions mimic and augment human thought patterns, whereas ML uses algorithms and statistical models to analyse patterns in data.

AI has led to significant medical advances in APAC – such as helping to tackle heart disease. In Australia, the leading cause of death is coronary artery disease and this year a team of AI and cardiac imaging experts from the University of Western Australia [launched](#) a tool to predict the risk of coronary heart disease.

According to India’s Circulation Journal, cardiovascular diseases have become the leading cause of mortality in the country. The biggest hospital group in India, Apollo Hospitals, has introduced an [AI tool](#) which predicts the risk of developing these diseases using data from over 400,000 patients. In Japan, heart disease is the second leading cause of death. Fujitsu has used [data](#) from more 630,000 electrocardiograms to develop an AI tool to detect heart disease at the early stages.

It easy to see why analytics is a growth area and why the analytics’ market is set to increase in APAC. In 2021, the APAC Healthcare analytics’ market was worth around 2.15 billion US dollars but this figure has been [estimated](#) to grow to 5.30 billion by 2026.

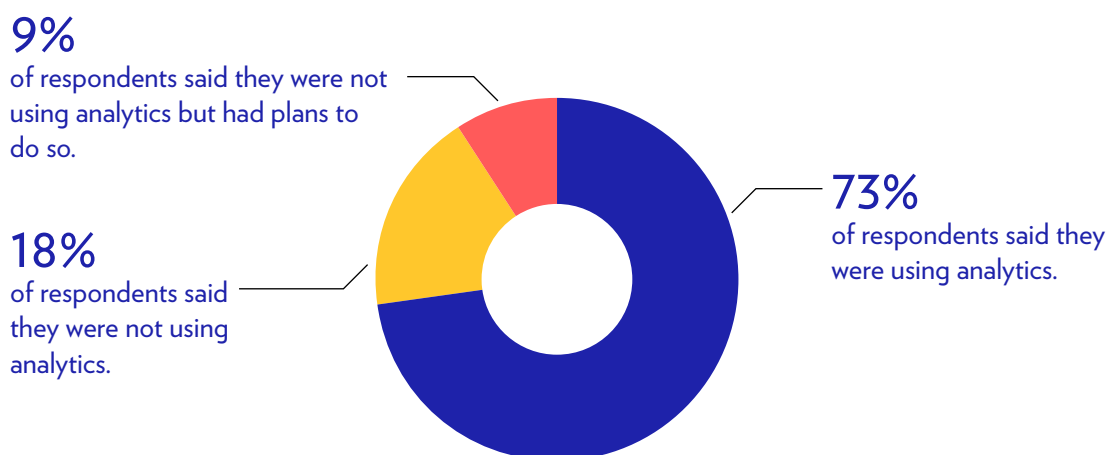
A recent report, Predictive Analytics in Health Care Trend Forecast by the Society of Actuaries, said: “Predictive analytics is poised to reshape the health care industry by achieving the Triple Aim of improved patient outcomes, quality of care and lower costs.” For the report, the society surveyed its health-payers and providers to see what they hoped to achieve through the use of predictive analytics and whether this was aligned with what was actually achieved.

The Society found that the top two desired outcomes for using predictive analytics were “reduced cost” (54%) and “patient satisfaction” (45%). These were closely aligned with the top two actual results that executives saw from the implementation of predictive analytics, which were “improved patient satisfaction” (42%) and “reduced cost” (39%).

However, there are still issues surrounding the collection of data, such as privacy, security, regulatory issues, and incomplete data sets. Despite these problems, a poll at the HIMSS APAC Health CIO Summit showed that almost three quarters of respondents were using analytics to help their operations.

Poll results

HIMSS asked: “Is your organisation leveraging analytics?”



Expert opinions



“ *Play smart and be informed by analytics and the insights that you can derive, using advanced analytics’ capabilities and technology, and data, can be used for better health care,”*

said James Gaston,
Senior Director of Maturity Models, HIMSS.

Gaston began the analytics session by saying that HIMSS was working with over 67,000 healthcare organisations in 50 countries. He stated that HIMSS focused on the quality of care, workforce development, health equality, operational performance, person-enabled care and sustainability when working with healthcare facilities.

He went on to talk about the HIMSS Digital Health Indicator (DHI) tool which helps healthcare enterprises to understand their digital capacity to respond to the healthcare ecosystem they are working in, and transform their organisation, measuring it holistically on multiple levels.



Professor Young-Hak Kim,
Director, Health Innovation Big Data Center, Asan Medical Center (AMC), explained why South Korea was investing in analytics:

“ *The national cost of healthcare is very high in many countries, and healthcare technology is considered a good way to solve this problem. Hospitals, as the most important players in the health and the medical sectors, must contribute to the revitalisation and the industrialisation of health and medical research.”*

He added that the medical center was setting up four major research areas, including new drug discovery, cell therapy, medical device development, and big data utilisation.

According to Kim, AI has already been implemented in many Korean hospitals as patient safety is their priority. He said that a data-driven clinical data supporting system was used in some hospitals to monitor high-risk patients: “So, for instance, my hospital is using an emergency team for a high-risk population. And so, the purpose of the team is to predict high risk and manage [it] aggressively to reduce or prevent the incidence of mortality or sudden events, such as sepsis.”

He added that AI was helping radiologists to analyse images, such as chest x-rays, and that automatic classification systems had reduced the time they had to spend examining these images. He also mentioned that the Korean FDA had just approved wearable devices, such as variable rings or patches, so they were being used to monitor patients, with some hospitals starting to incorporate bio data and hospital data.

Kim pointed out that some Korean hospitals were no longer using private servers to store data:

“ We have a hybrid strategy, and analytics is important, and we think that analytics is the next generation and the direction that hospitals are going. So, we are changing the server system to cloud in terms of the data analytics. I mean, the anonymised data is transported from private servers to the cloud. So, we are now in the transition period. And personally, I believe that the cloud should be picked up in every country.”

Other institutions have been pushing technology forward too, according to Gaston. He said the New Zealand Ministry of Health had done “incredible work” driving a national digital health strategy; Calvary Healthcare in Australia had been working hard to remove care silos; and the Hong Kong Ministry of Health had been focusing on its digital health investment in benchmarking itself.

He added that in the United States, the Children’s Hospital of Colorado had been using descriptive and diagnostic analytics to track and improve patient safety while Northshore Health System had been using advanced analytics, predictive modelling and ML to reduce hospital mortality rates and readmissions.

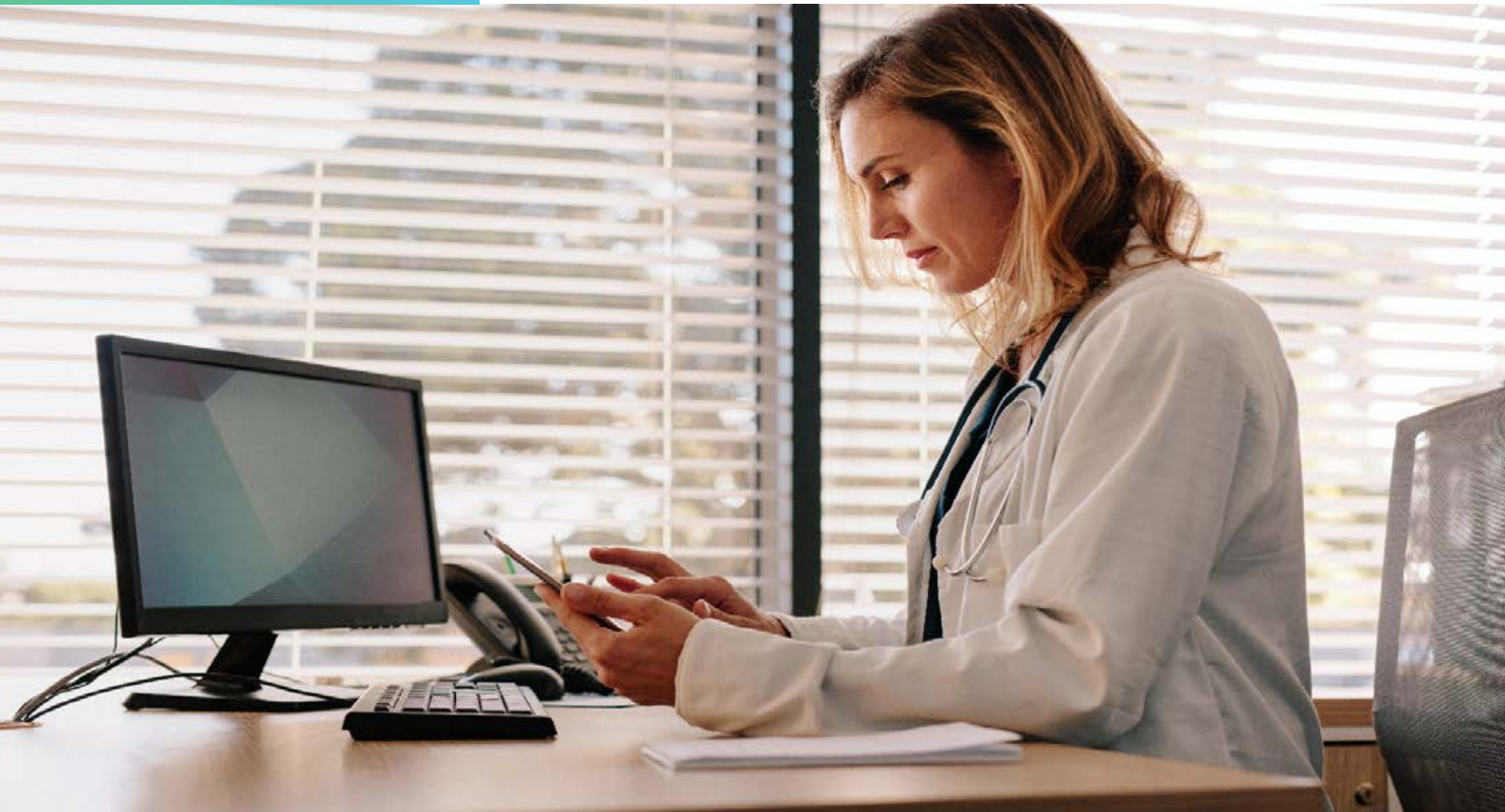
Main takeaways

As the use of analytics is becoming more widespread, it is advisable to:

- Research the benefits of using analytics and any potential problems.
- Consider using advanced analytics, predictive modelling and ML to try to reduce hospital mortality and readmission rates.
- Be informed by analytics and use the insights that can be derived from using advanced analytics’ capabilities and technology, and data, to improve health care.
- Develop the skills necessary to use analytics to track and drive organisational performance, not just in the clinical areas, but also in operational and financial anatomy.
- Move anonymised data from private servers to cloud-based services.
- Remove data silos.

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Automation is vital to help combat a pandemic

Healthcare automation has been successfully deployed in APAC to help manage the surge in COVID-19 cases. Automation, which enables tasks to be completed without human intervention, can smooth processes and perform administrative tasks.

Automation has been used in various ways to help ease the additional burden of care in APAC during the pandemic. For example, it has been used to improve workflows in ICUs. It is very demanding for healthcare teams to deliver processes in ICUs as according to some estimates, around 178 processes are delivered to each patient every day.

The Kasih Ibu Hospital in Bali in Indonesia installed a new Critical Care and Anesthesia system to try to improve the information flow between patients and healthcare professionals. This was integrated with a Patient Deterioration Solution to try to help prevent patient deterioration outside Intensive Care, to ameliorate patient condition tracking and to improve patient care overall.

In Australia, Sydney Local Health District created its first virtual hospital in New South Wales. The RPA Virtual Hospital used innovative digital strategies to support infected patients who were self-isolating at home. Singapore also implemented a remote monitoring platform for COVID-19 patients to assess signs of deterioration, which led to improved outcomes. In India, the Fortis Hospital in Bangalore deployed a robot, with a thermal imaging camera, to carry out initial health screenings to try to limit the spread of infection.

Automation uses technology to perform structured digital tasks following a set of rule-based business procedures. It is used for a range of tasks from updating patient records, optimising appointment scheduling to automating workflows in the operating room or complex data extraction. It can mimic repetitive human actions and increase efficiencies, potentially reducing labour costs.

According to the APAC Intelligent Automation 2020-2024 report, the industrial automation market is categorised into two broad segments: AI and Robotic Process Automation (RPA). The report said AI is mainly being used for better decision-making and strategic thinking, while RPA is used for repetitive manual processes.

The report revealed that APAC countries are ahead in automation:

“ China and Singapore are already leading the adoption and are expected to further emerge as global leaders. Singapore is witnessing a strong adoption of IA technology. The APAC region as a whole is expected to emerge as a hub for excellence in automation.”

A white paper on robotic process automation which appears on the HIMSS website but is not necessarily reflective of its views, explained why RPA was useful: “RPA acts as a unique temporary or full-time employee to supplement your department or business unit. It gets projects done in a fraction of the time it would take a human, works 24x7x365, and never gets tired. There’s a reason why robotic process automation is seeing its fastest growth across all industries, especially healthcare.

The healthcare automation market around the world is forecast to increase at a rate of 8.8% Compound Annual Growth Rate (CAGR) from 2017 to 2025, according to [Transparency Market Research](#). The study also predicts that the market for healthcare automation is likely to be valued at US\$ 58.98 billion by 2025.

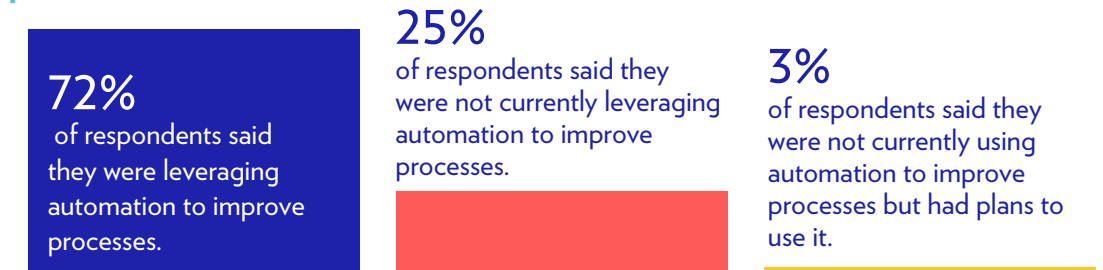
There are fears that automation could lead to job losses, but it is widely believed that instead of replacing medical professionals, technology will augment their work. For example, even though AI is used to analyse x-rays and automatic classification systems accelerate this process, radiologists are still necessary.

Interestingly, a recent [survey](#) in APAC found that more than 73% of the respondents in markets such as China, Malaysia, India, and Indonesia responded positively to the use of automation and AI in the workplace.

However, there remain concerns around patient privacy, product compatibility, integration, interoperability and hacking, as well as concerns that technology will not be able to update systems quickly enough to keep pace with the expansion in medical knowledge. Despite these issues, a poll at the HIMSS APAC Health CIO Summit found that healthcare organisations in the region are increasingly leveraging automation to improve processes.

Poll results

HIMSS asked: “Does your organisation currently leverage automation to improve processes?”



Expert opinions



“ We’ll have an integrated EMR that allows read-only access to referring providers, who are outside of Cleveland Clinic’s technology ecosystem, to streamline transitions and diagnostics. We’ll have a patient portal that patients can access on their mobile devices to book appointments, to check into appointments via a phone app when they arrive to renew prescriptions, to order food via an app as an inpatient, and to manage their patient records from mobile devices.”

commented Gareth Sherlock,

Chief Information Officer at the Cleveland Clinic London, describing innovative approaches at the soon-to-be-opened Cleveland Clinic London.

Sherlock told the summit that the Cleveland Clinic, which is a not-for-profit global academic health system, would also give caregivers access to the patient's electronic record and enable them to receive critical labs and other alerts on their phones. He added that medical equipment and point-of-care devices would be integrated into EMRs to improve workflow and patient safety.

COVID-19 has accelerated remote care at Cleveland and telemedicine, which accounted for less than 1% of all consultations before the pandemic, has risen to more than 27%. As part of Cleveland's response to the virus, a home monitoring programme was developed, according to Sherlock: "At Main Campus in Cleveland, we partnered with Epic to develop a home monitoring programme for our COVID patients. We enrolled 2,000 patients in less than two months of operations. Engagement from our patients was better, outcomes were equivalent, or better, and the programme represented a new and potentially more convenient patient experience, as well as a more efficient provider experience."

The Cleveland Clinic is now looking at ways to convert its pandemic era pilots into everyday practice. Sherlock cited one example of an ongoing joint venture with Amwell around Virtual Second Opinions. In 2019 they launched a project together to provide Cleveland clinic expertise, in over 550 advanced specialities, to patients globally and Sherlock said they were already seeing positive results.

"We've seen the impact after just one year. 72% of virtual second opinions from around the world, has resulted in a change to patient treatment plans and 28% resulted in a change to the patient diagnosis. In May, we expanded our programme to include multiple cancers, and this is a sign of how you can leverage momentum from COVID to drive innovation for other diseases," said Sherlock.

Benedict Sulaiman, Vice President Information Technology, Director at Ramsay Sime Darby Indonesia said that the pandemic had given the company a chance to focus on automation: "Currently our automation in Indonesia is still on progressive improvement. Because as we know, one of the key factors for now, for this automation, actually does come from COVID.

In terms of the resources, we are still relying quite a lot on human resources. That's why this automation has been a long, you can say plan, but it's always, at the end of the day, a challenge because of human resource capabilities, the current human resources as well. And now with the pandemic; actually, it gives us the opportunity to do that."



Andrew Pearce, Senior Digital Health

Strategist, HIMSS said it was vital to examine outcomes to determine which automation programmes should be deployed:

“ I have a strategy, and the strategies and priorities, are informed by automated real-time programme-level outcomes that are linked back in a consistent way to quality, safety, and cost data. They also have data privacy regulations, security and flexible working policies to support the adoption and scalability of innovation.”

Main takeaways

Automation is increasingly being used in healthcare. If using automation or considering implementing it, it is advisable to:

- Ensure that strategies and priorities are informed by automated real-time programme level outcomes, which are linked back in a consistent way to quality, safety and cost data.
- Make sure there that data privacy regulations are observed when deploying automation.
- Research security concerns around automation and tighten security before implementation.
- Report patient safety outcomes publicly and transparently and make governance decisions based on these outcomes.
- Healthcare organisations should undertake very robust processes for co-development and pilots with consumers and clinicians as they roll out patient-led digital initiatives.
- Examine the potential to leverage momentum from COVID-19 to drive innovation for other diseases.

Digital literacy is the cornerstone for future-proofing healthcare

APAC healthcare organisations should ensure that their workforces have the digital literacy skills to embrace new technologies, such as AI and RPA. But there's no time to lose and workers should start upskilling or reskilling soon.

The World Health Organisation defines Digital Health Literacy, or eHealth Literacy, as the ability to seek, find, understand, and appraise health information from electronic sources and apply the knowledge gained to addressing or solving a health problem.

According to The Harvard Business Review, 90% of business leaders say data literacy is key to company success. The Data Literacy Index also states that workforce data literacy has a proven correlation with corporate performance. It also points out that Singapore has performed exceptionally well for its region and is the most data literate nation globally.

Training has long played an important part in healthcare but now that digital technology has been adopted at such speed, it seems more important than ever. The McKinsey Global Institute said: “Skill shifts have accompanied the introduction of new technologies in the workplace since at least the Industrial Revolution, but adoption of automation and AI will mark an acceleration over the shifts of even the recent past.”

More than half of the participants interviewed for the Philips' Future Health Index 2021 described staff inexperience with new technology as a barrier, which prevented healthcare leaders from preparing for the future. However, the Future Health Index 2020 found that younger healthcare professionals were keen to access further training, enabling them to fully utilise digital health technologies.

A recent article in the Training Journal said one of the top business trends for 2021 is the upskilling and reskilling of employees. It said that some APAC regions were particularly keen on training:

“ By looking at significant projected year-on-year increases, in upskilling and reskilling spend per employee, the following countries are currently spending the most on their employees. Out of all the top ten countries, China, Australia and Hong Kong dominate the list as the region with the most talent-competitive countries in the world.”

Digital health adoption has been so rapid that it can be hard to know where to turn for advice about training. The TIGER International Competency Synthesis Project outlines recommended core international competencies. It has received what it describes as expert input from 51 countries and 22 global studies to help measure and advance the development of a skilled workforce around the world. These competencies range from healthcare delivery to IT.

The project lists the different digital competencies required for different job roles. For example, a variety of digital skills are needed for clinical nursing. These range from nursing documentation,

information and knowledge management, principles of nursing information, patient protection and security, ethics and IT, eHealth telematics and telehealth, including interoperability, and assistive technology for ageing people.

It has been widely proposed that such competencies should be included in training and certification programmes, and prospective career pathways to enable the workforce to fully embrace digital technologies, but these suggestions have yet to be formally adopted.

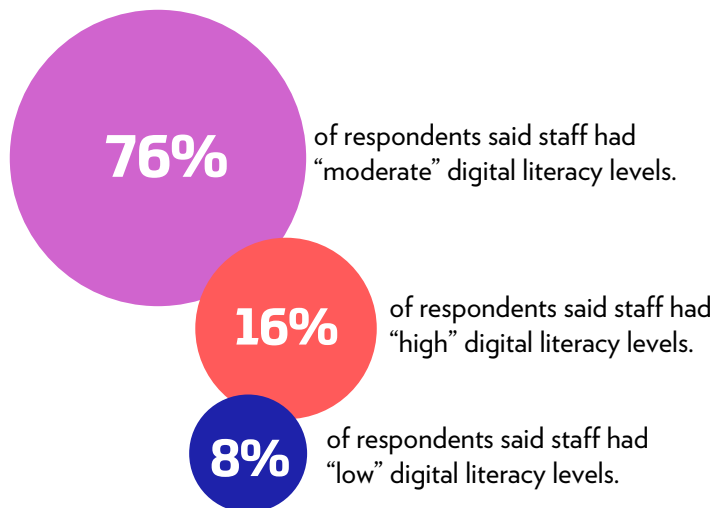
Unlocking APAC's Digital Potential: Changing Digital Skill Needs and Policy Approaches is a new [report](#) predicting which digital skills will be necessary in the region over the next five years. The report considers six APAC countries: Singapore, Australia, India, Indonesia, Japan, and South Korea.

It says that digital workers should focus on training in advanced cloud computing skills, as well as advanced data skills, including cybersecurity, AI, and ML. It forecasts that the number of workers needing these skills is expected to triple by 2025.

A poll at the HIMSS APAC Health CIO Summit showed that three out of four of healthcare organisations in APAC have at least moderate levels of digital literacy.

Poll results

HIMSS asked: "What would you say is the overall digital literacy level of staff in your organisation?"



Expert opinions

“ The biggest focus around getting staff to embrace change in digitalisation is to get the hardest person, or the most sceptical staff member you have, as a core part of a transformation journey project. And if you can convince them and get them to talk about the successes that they've been able to achieve, you will quite easily bring along the rest of the organisation because they will be the greatest supporter for you, once you convert them,”
commented Pearce.

He suggested that the best way to get caregivers on board was to outline the benefits of digital technology: “If you can make it within the workflow, and make it convenient, easy and seamless, then clinicians will adopt change reasonably quickly, because they all want to improve client and patient outcomes. But they don’t want to do it to the detriment of having poor processes in efficiency because of technology impacting patient care outcomes.”

According to Sherlock, physician leaders at Cleveland London have been actively encouraged to get involved in the implementation of technology: “So, I get a lot of excitement from the clinicians and physicians in London who are not used to being at the table in IT discussions and owning the system. I go, ‘Hey, this is yours, guys. I’m building this for you. You need to help me make sure this is going to be good for you. I’m not going to thrust it out on your lap. It’s your system’, so, they love it. They love being part of that!”

Sherlock emphasised the importance of digital training: “It’s not enough to implement innovations though, we need to systematise how we use them in practice. The way this was done at Cleveland Clinic was to firstly organise a number of virtual training sessions to help providers get up to speed with how to navigate the virtual portal and develop a web-side manner to interact with patients. Secondly, we developed the specialty specific documentation template in our medical record for virtual outpatient care and implemented changes to our scheduling system. And thirdly, we synthesised all of these learnings into a digital health handbook that’s publicly available and free for any organisation to use.”

He added that most of the London caregivers worked virtually for an extended period, but were starting to return to work: “We always put their safety first and we were very transparent with communication. In addition to this, we believe we built a very strong organisational culture that’s driven strong caregiver engagement and retention. And the question for us to figure out is, how do we leverage our new hybrid workforce capabilities to deliver the best possible care for our patients?”

HIMSS had been working closely with The Hospital Authority of Hong Kong (HA). HA has 43 hospitals, 49 specialist outpatient clinics, 73 General Outpatient clinics and a workforce of over 84,000 people. Pearce said HIMSS had analysed HA’s performance using the HIMSS DHI, which measured four areas: interoperability, person-enabled health, predictive analytics, and workforce governance.

Pearce said that HA scored highly in governance and workforce: “What ‘good’ looks like, in terms of governance and workforce, is strategic leadership and oversight of digital health systems that ensure the policy and regulatory environment of health systems, [that] guard privacy, security, stewardship, and accountability. Governance puts priority focus on a sustainable high-performance workforce that is prepared to deliver digitally enabled health services.”

According to Pearce, a sustainable, high performing digital health ecosystem requires unique governance structures to transform the workplace environments and there should be a focus on mandatory training for all. These digital health environments, in turn, enable care delivery models that are informed by data analytics, and improve when guided by robust data stewardship policy and decision-making process.

He went on to tell the summit why HA had scored an exemplary 97% and why it believes it can still do better: “They had a real focus on mandatory training for all of their staff in digitalisation and digital literacy. And they have also undertaken a very robust process for co-development and pilots, with consumers and clinicians, as they roll out new patient-led and consumer clinically involved digital initiatives.

They also have as a strength, a well-developed population quality, population quality and safety outcomes reported publicly, that’s transparent, and have the governance decisions and accountabilities around that... But they also think they can be even better around this governance and workforce, and digitally enabled workforce piece. So, what does that mean for them?

So, for them, the improvements are all around having patient and family-reported outcomes that are captured and tracked, to advance and strengthen care delivery, that link back to values and the needs of patients and their families. They want to track population outcomes across Hong Kong and analyse the impact of social determinants of health on patient and population health outcomes, and [create] personalised delivery programs for those population segments.

They want to integrate social determinants of health data, and they want to ensure that their risk management processes with their staff and governance across the authority consider automation bias and equity in all access to care, and how staff are informed and work within that environment. So, for us, this is a great example from what we see is one of the fundamental digital health ecosystems, capacity components, governance and workforce. They are great proponents, and they want to be better. And I guess that’s what we’re all about, isn’t it? We want to learn from each other and be even better.”

Sherlock agreed that governance was vital for successful innovation: “Understanding what your organisation stands for, your goals, your values, and what your caregivers need to know – understand these and live by them.”

Main takeaways

Training is vital to enable workforces to gain high levels of digital literacy, so it is advisable to:

- Consider mandatory training for all staff in digitalisation and digital literacy.
- Check out the [TIGER International Competency Synthesis Project](#).
- Consider developing career paths based on competencies.
- Consider offering incentives to upskill or re-skill.
- Understand that flexible working policies support the adoption and scalability of innovation.
- Encourage clinician leaders to get involved with the implementation of technology.
- Remember that high performing digital health ecosystems require workforce governance. Governance puts priority focus on a sustainable high-performance workforce that is prepared to deliver digitally enabled health services.
- Be aware that strategic leadership and oversight of digital health systems ensure the policy and regulatory environment of health systems, that guard privacy, security, stewardship, and accountability.
- Understand what your organisation stands for, your goals, your values, and what your caregivers need to know.

ABOUT HIMSS

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HIMSS is a global advisor and thought leader supporting the transformation of the health ecosystem through information and technology. As a mission-driven non-profit, HIMSS offers a unique depth and breadth of expertise in health innovation, public policy, workforce development, research and analytics to advise global leaders, stakeholders and influencers on best.

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