

Future of work

Capstone Paper: Ministry of Health
July 2021



Foreword

Without a doubt, the past 5 - 10 years have seen rapid advancements in the development and use of new technologies in health care including Artificial Intelligence (AI), Virtual Reality (VR), data analytics, and robotics. We know that the pace of these developments will continue to escalate, offering unmeasured opportunities for healthcare consumers, providers, researchers and developers.

The recent global case for change in health care has highlighted that where there is a 'burning platform' for change, it is possible. The COVID-19 pandemic has demonstrated many technological advancements could be rapidly developed, endorsed and deployed globally and, much faster than had previously been possible.

But what does the pace of all this change mean for complex health systems, and what considerations must be deliberated, to ensure we have the workforce capability to stay abreast of these rapid changes and continue to deliver a world class human centred health service.

The real essence in responding to the changes that will impact on the workplace, is to say its our chance to make our system the best in the world, that's the opportunity that we have.

**Phil Minns,
Deputy Secretary, People Culture and
Governance, 2021**

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In the years ahead, digital platforms and the data assets they create and use will provide new tools in health systems' constant effort to balance tension in core objectives: better experiences for patients and clinicians, safer care and better healthcare outcomes, improvements in access to services, and financial sustainability.

Emerging technologies, changing consumer expectations, and a constantly evolving evidence-base will have significant implications for the future of work in healthcare systems around the world. Through long-term planning and investments, the NSW health system is building from strong foundations, and is well advanced on its journey toward sophisticated capabilities that will be important enablers of system transformation in the years ahead.

In addition to their roles in shaping strategy and allocating capital to future investment priorities, leaders in healthcare play a critical role in helping a large and diverse workforce navigate these complex transformations and adapt to important changes in the way that care is delivered in a digital world. The future of work will provide opportunities for new roles and demand new capabilities that will be instrumental in achieving the most important health system objective: putting consumers at the centre of systems that deliver better, safer care.

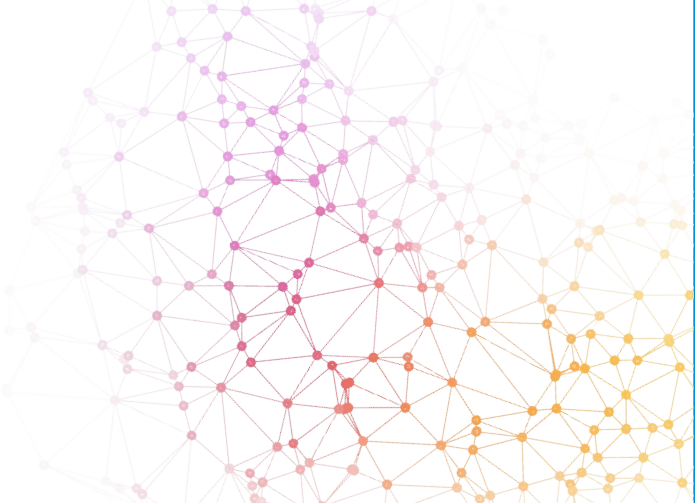
Evan Rawstron
Partner, KPMG

s outlined with the Ministry of Health the Scope Section of the e services provided in connection with this engagement ent, which is not subject to assurance or other standards issued assurance Standards Board and, consequently no opinions or assurance have been expressed. No warranty of completeness, relation to the statements and representations made by, and the provided by the Ministry of Health and stakeholders consulted as the Ministry of Health have indicated within this report the ded. We have not sought to independently verify those sources he report. KPMG is under no obligation in any circumstance to or written form, for events occurring after the report has been

"The future of work

means a lot of different things to different people... our job is how we find a key message that cuts through to every person that works for us."

**-Susan Pearce
Deputy Secretary, Patient
Experience and System
Performance**



Across the NSW health system we need to create a shared understanding of what the 'future of work' means to provide clarity regarding the way forward, and to enable progress towards the digital future.

This is important if NSW Health is to retain its reputation for high quality, sustainable, patient centered care.

As well as undertaking research into the expected impacts on the health system, we asked some of the leaders across the NSW Health system what they believe is critical in addressing the opportunities and challenges posed by the future of work in our health system.



**This is
what they
said...**

Why is the future of work an important consideration right now?



Consumer expectations are already changing, and we need to be able respect, respond and meet these needs.

“Consumer needs and value should be the most important determinant on whether the technology investment will be worthwhile.”

- Susan Pearce, Deputy Secretary, Patient Experience and System Performance

Consumer expectations around the use of technology in their healthcare journey are rapidly changing. Australians increasingly expect that technology in healthcare will be seamless and integrated, personalised and tailored, world-leading and contemporary and overcome long standing issues in relation to health access, health outcomes and consumer experience. These expectations will impact who, how and where healthcare is delivered into the future.



Increasingly in health, the workforce is under pressure to deliver more with less. Technology provides the opportunity to free capacity and focus on patient care.

“The future of work will mean the workforce are more analytical in the tasks they undertake and less transactional. This will free time to be with the patient and focus on what matters most.”

-Carmen Rechbauer, Chief Executive, HealthShare NSW

A key driver for the increased use of technology across the health system are the benefits expected in diagnosing, treating and managing health conditions, as well as driving efficiency in the consumer experience. However it is important these benefits are realised, and that they genuinely free workforce capacity to focus on clinical care.



There are a number of emerging digital innovations which we can be at the forefront of adopting in Australia.

Our executive health leaders were asked what the key technologies are that will transform the NSW Health system in the future. They all had different answers, showing the breadth and depth of the change ahead.

Key transformational technologies expected include Artificial Intelligence, Internet of Things, Genomics and Personalised Medicine, Tele-technologies (e.g. Telehealth), Prescriptive and Predictive Analytics and 3D Printing and are discussed further in this paper. These technologies will have different impacts on different occupations and speciality areas across the health workforce.



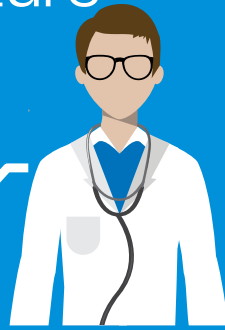
Rather than something in our long term future, it should be seen as the next step in our technology journey.

“We need to reduce some of the anxiety around the ‘future of work’ and what we are aiming for. Future of work is really about the next step in the process – through focusing on incremental steps and what we need to do today or tomorrow we will achieve the required change over time.”

-Carmen Rechbauer, Chief Executive, HealthShare NSW

Both research and engagement with our leaders suggests that adoption of these emerging technologies will augment and support rather than replace jobs in the health industry, and that rather than being seen as something new it continues and accelerates a journey that we have already been undertaking.

What is the future of work?



The impact of technological and digital health advancements, such as artificial intelligence and automation, on the workforce.

Why is it important?

Digital health will be key enabler in addressing the big healthcare challenges of the twenty-first century.

If used effectively, emerging technologies, will lead to improved safety and quality, empowered consumers, better decision quality, improved patient outcomes, and optimised services based on understanding patterns of need.

The adoption of emerging technologies will contribute to a more sustainable health system.

What will it mean for the health workforce?

- The implementation of these emerging technologies will impact on the health workforce's tasks and functions. There are a range of models that predict these impacts, but it is key to note it is dependant on the technological adoption journey taken by each Local Health District, and locally, within each hospital.
- While there will be some similarities, the functions and tasks that are impacted will depend on the health profession and speciality, the health context (such as metropolitan, rural and regional), and the health setting (such as emergency care, acute care, home and community care). To help the workforce, we will need a nuanced view of the change ahead.

How can I learn more about what it means for me?

In acknowledgment of the differences across the health system, **four papers** provide greater detail on the future of work in healthcare. These are:

- 1. Understanding the impacts of technology on the healthcare workforce.** This paper provides an overarching view of the change ahead, and the enablers required to support the workforce on this journey.
- 2. Understanding the impacts of technology on medical specialities.** This paper provides detail of the technology and workforce changes expected across the areas of surgery, dermatology, general practice, pathology and radiology.
- 3. Understanding the impacts of technology on the shared services workforce.** This paper provides detail of the technology and workforce changes expected across business and administration services, linen services, food services, logistics and supply chain and maintenance services.
- 4. Understanding the impact of technology on the rural and remote workforce.** This paper acknowledges the differences in the technological adoption journey and priorities in the rural and remote communities and discusses how this may change the journey ahead.



There is often a focus on exciting technologies like Artificial Intelligence and genomics, however process automation of simple paper based processes is still being actioned in some areas. These changes alone are expected to drive significant workforce, financial and business process efficiencies.



What are the key technologies that will impact on the workforce in the near term?



Our leaders were asked which technologies they believe will have the most impact on the NSW Health system over the next five years. Each of them focused on different technologies which underscores the breadth and impact of emerging technologies across the health system.



Artificial Intelligence

"For HealthShare Artificial Intelligence will be a big change. Our leaders are looking for more timely information, and we have more and more data coming to us and we need to be able to understand it and explain what is happening across the whole system."

Carmen Rechbauer, Chief Executive, HealthShare NSW



Wearable Devices (and Internet of Things)

"More and more devices are emerging from medical grade devices that monitor oxygen levels to consumer supplied devices like Fitbits and iWatches. These enable us to better look after patients in their homes and I think we will see more of this in the future. This will require us to think about new models of care."

-Zoran Bolevich, Chief Executive eHealth NSW



3D Printing

"3D printing is also key in surgery and medical device developments, and has already enabled significant changes in the way we undertake head and neck surgery and the replacement of parts of the body impacted by cancer, such as a recent case where a patient's sternum was successfully replaced through 3D Printing"

-Margot Mains, Chief Executive Illawarra Shoalhaven Local Health District



Genomics and Personalised Medicine

"Genomics and personalised medicine will be huge and will require our workforce to think about how it will be incorporated to be an integral part of how we provide care."

-Zoran Bolevich, Chief Executive eHealth NSW



Predictive Analytics

"We are in a world of data and it is increasingly important for clinical decision making and business decisions. Prescriptive and predictive analytics will be important to better understand where we are going for health service delivery."

-Margot Mains, Chief Executive Illawarra Shoalhaven Local Health District



Telehealth

"Telehealth is a key action needed to reduce the tyranny of distance... we have lots of small communities where access is the major concern"

-Margaret Bennett, Chief Executive, Southern NSW Local Health District

Implementation of these technologies will be impacted by:



TIME TO ADOPTION

Different technologies are developing at different rates and some will take longer than others for the workforce to start adopting or using them more broadly. Effective adoption will also depend on the workforce's experience in using technology and how this has been implemented previously.



FUNDING

Funding and reimbursements will impact which technologies are adopted where, when and how they are used.



APPLICABILITY TO SPECIALISATION/ WORKFORCE GROUP

Some technologies will impact some specialties and health workforces more than others – not all technologies will be relevant



TECH MATURITY

Technologies are developing at different rates and may be dependent on research, technological advancements, priorities of technology investors, expected market impact and expected market demand.

LEGAL/ETHICAL

Some technologies will have a strong need for legal and ethical frameworks around how they are used (for example genomics) to ensure we create the health system we want into the future.



DIGITAL PARAMETERS

Some technologies will require high levels of security and privacy in the way they are utilised to protect each individual's health information and prevent misuse.



CONSUMER DEMAND

Technology is increasingly being used in all facets of our lives. Consumer expectations around how technologies will be used in the management for their health will be key in investment decisions.



HUMAN CENTRED DESIGN

"Co-design and human factored design, prototypes and feedback will be important to improve upon in our future of work journey. Health can learn from other industries about how to do this better."

- Zoran Bolevich, Chief Executive eHealth NSW





“*When considering our technology spending, our underpinning principle should be including and engaging our staff in the process of prioritisation, and being clear and transparent about the choices we need to make.*

Considerations in this process will include things like systems strategy, government priorities, safety and quality, and delivering value and benefit to our patients.

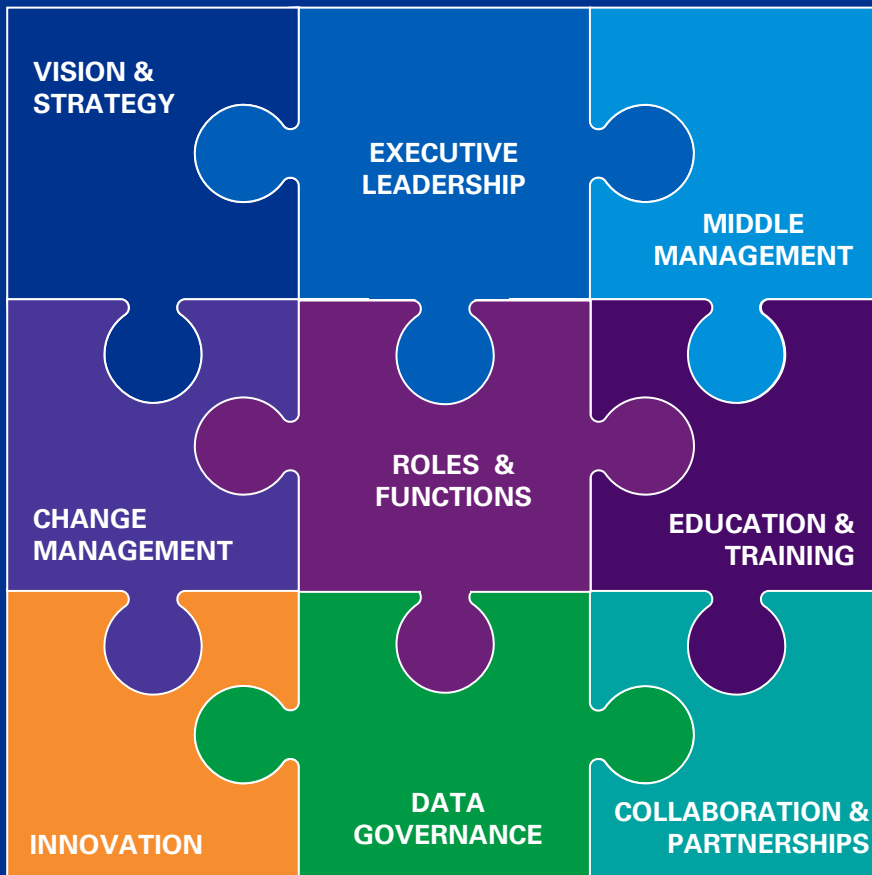
**-Zoran Bolevich,
Chief Executive eHealth NSW**

What are the key enablers that will support the workforce?

The following key enablers were identified by combining together research and best practice, with our leaders' practical and lived experiences about what is needed to assist the workforce with the change ahead. Further detail on these is provided in the Healthcare Workforce paper.



“My advice would be to be an early adopter of technology so you can lead and challenge and optimise investment.”



“We need to have a clear strategy and direction and a clear set of steps we all own collectively.”

“The change and making it a part of the way we do business takes a very long time.”

“People need time to think about what next to keep our health system improving from an already great place.”

“Our middle managers are the ones who will take the staff through to the new future and help them in getting there.”

“Education and training and capability development are crucial.”

“Collaboration with universities, commercial organisations or companies brings new skills and capabilities.”

“Data governance is needed to inform the decisions, drive the change and provide the clinical governance expected.”

What are some of the changes we could expect to see across NSW health?



Across all health occupations:

Globally, the future of work in health is the subject of a number of strategic papers which recognise the step change required to utilise technology to address the big healthcare challenges of the twenty-first century. If the benefits of technology are realised, it will transform healthcare. This will occur through improving safety and quality, empowering consumers, driving better decisions (for example in value-based healthcare), and changing and optimising patterns of need and services.

To plan for and achieve these benefits will require deeper consideration of the very different impacts emerging technologies will have on the range of health occupations. It will also need to recognise that the technology roadmap will be different across every hospital and LHD, and will depend on the local decisions on technologies, timeframes, and sequencing.

Navigating through this complex and dynamic change also requires knowledge and leadership around the key enablers that will assist the workforce. These include strategy vision, leadership, change management, education and training and innovation and culture. Further detail is provided in the [Healthcare Workforce](#) paper



For the medical workforce:

The medical workforce will play a pivotal role in the Future of Work, including in the advocacy for new and emerging technologies, assisting with the adoption of new technologies, and in leading the changes to clinical roles and functions across the health workforce. The tasks and functions undertaken by the medical workforce will change as a result of technology, however each speciality will change in different ways.

The key technologies which are predicted to impact the whole medical workforce in a similar way include eHealth, interoperable clinical systems, prescriptive analytics and command centres. Technologies that are expected to impact medical specialties at different rates and in different ways include artificial intelligence, genomics, digital medicine and telemedicine.

Taking a more nuanced view of how these technologies are expected to change specific specialities provides a more tangible understanding of the role and function changes expected for the medical workforce. The detail of expected workforce and technology changes in the speciality areas of General Practice, Surgery, Dermatology, Radiology and Pathology are provided in the [Medical Workforce](#) paper.

Case Study: HoloLens- AR

HoloLens, a wearable augmented reality (AR) system, allows for image overlay on the patient during surgery, with relevant information built into the patient hologram, meaning that targets can be identified in relation to the underlying anatomy of the patient. This allows the surgeon to tailor their approach according to the anatomical variations of the patient.

Van Wageningen. (2018). Healthcare teams gain edge using VR, AR for surgery, training.



For those in shared services occupations:

Shared services are key to health service delivery and include functions such as food services, linen services, human resources, financial services, patient transport, procurement and logistics.

While efficiency optimisation for many shared services has historically focused on lean supply chains and service delivery, new and emerging technologies are enabling or promising heightened efficiency in many tasks and functions that have been manually intensive and previously unable to be automated or augmented by technology.

The key technologies which are predicted to impact on the majority of the shared services workforce include the internet of things (IoT), artificial intelligence (AI), automation, and robotics. These technologies will require digital literacy from the workforce, but the extent to which these technologies augment or automate current tasks is expected to vary for each occupation.

Technologies specific to each shared services area are also emerging, and these will have very different impacts on workforce roles into the future. Further detail is provided in the [Shared Services Workforce](#) paper.

Case Study: Aquifi - Dimensioning

Dimensioning, which involves the use of a 3D camera and software algorithms, is able to support the fast and efficient measurement of freight, allowing for dynamic load capacity optimisation and volume-based pricing.

DHL. (2019). Logistics Trend Radar.



In rural and regional hospitals and community health centres:

The delivery of healthcare services in the rural context cannot simply be a replica of that delivered in urban settings. There are a number of unique characteristics of the rural environment that have a significant influence on how services can and should be designed and delivered. These include:

- Geographic size and scale;
- Higher proportion of vulnerable populations often with poorer health outcomes;
- Diverse communities; and
- Workforce distribution challenges and generalisation focus.

Based on these characteristics, key factors which determine whether a technology should be implemented in rural and regional sites include internet access, financial sustainability based on volume, logistics, reimbursements, safety and quality and benefit to consumers.

Further detail on these differences are detailed in the [Rural Health](#) paper.

Case Study: Robotics Centre - Southern NSW LHD

"We have set up a Robotics Centre in Southern NSW Local Health District. The investment in optimising technology created a win - win, better care for patients and an improved environment for health professionals- it led to allied health wanting to work here and a positive point for the region."

- Margaret Bennett, Chief Executive Southern

Contact us

NSW Ministry of Health

1 Reserve Rd
St Leonards, NSW 2065
Tel: +61 2 9391 9000

KPMG

300 Barangaroo Avenue
Sydney, NSW 2000
Tel: +61 2 9335 7000

