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Strategic review of telehealth in NSW: Final report

NSW Ministry of Health

8 April 2015



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This *Final Report* on the *Strategic review of telehealth in NSW* is accompanied by an *Appendices* document. An outline of the contents of the two documents is provided below.

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NSW Ministry of Health 24 february 2015

Strategic review of telehealth in NSW: Appendices

Companion document to the Strategic review of telehealth in NSW: Final report

NSW Ministry of Health

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Glossary

Term	Description	
ACAT	Aged Care Assessment Team	
ABF	Activity Based Funding	
ACI	Agency for Clinical Innovation	
AMS	Aboriginal Medical Service	
ASGCRA	Australian Standard Geographical Classification Remoteness Area	
AusHFG	Australasian Health Facility Guidelines	
CCLHD	Central Coast Local Health District	
снw	The Children's Hospital at Westmead	
DOTS	Directly observed treatment, short-course	
ED	Emergency department	
eMR	Electronic Medical Record	
FWLHD	Far West Local Health District	
GP	General Practitioner	
НЕТІ	The Health Education and Training Institute	
HNELHD	Hunter New England Local Health District	
ІСТ	Information and Communication Technology	
ІНРА	Independent Hospital Pricing Authority	
IPTAAS	Isolated Patients Travel and Accommodation Assistance Scheme	
крі	Key Performance Indicator	
LHD	Local Health District	
MBS	Medicare Benefits Scheme	
MHECS	Mental Health Emergency Care Service	
MLHD	Murrumbidgee Local Health District	
MNCLHD	Mid North Coast Local Health District	

Term	Description
мон	Ministry of Health (NSW)
NBMLHD	Nepean Blue Mountains Local Health District
NGO	Non-Governmental Organisation
NNSWLHD	Northern New South Wales Local Health District
NSLHD	Northern Sydney Local Health District
RFDS	Royal Flying Doctor Service
RHA	Rural Health Alliance
SCES	State-wide Complex Epilepsy Network
SCHN	Sydney Children's Hospital Network
SCI	Spinal Cord Injury
SHN	Specialty Health Network
SLHD	Sydney Local Health District
SWSLHD	South Western Sydney Local Health District
Telehealth	Telehealth is the secure transmission of images, voice and data between two or more units via telecommunication channels, to provide clinical advice, consultation, monitoring and training and administrative services (Agency for Clinical Innovation, 2014). (Working definition used throughout the review)
WNSWLHD	Western New South Wales Local Health District
WSLHD	Western Sydney Local Health District

Framework for telehealth in NSW

This framework provides a high level summary of the key points identified through this review of telehealth in NSW and that are explained in detail in the body of this report.



1 Executive summary

Telehealth provides many demonstrated benefits for patients, their families and carers, health care workers and the broader health system. Significant funds and effort have been invested in telehealth in NSW to support high quality, patient-centred care. Nonetheless, this review found telehealth uptake across Local Health Districts (LHDs) and Specialty Health Networks (SHNs) has been variable. In addition, there is more to be done so that telehealth is business as usual across NSW. Metropolitan, rural and remote regions of NSW experience similar barriers and enablers regarding telehealth uptake and sustained usage. At a state-wide level, the maturity of telehealth services in NSW compared to other Australian and international jurisdictions is mid-range.

Telehealth usage in NSW commenced in the mid-1990s with the aim of improving access to, equity and quality of health services particularly in rural and remote areas. Since then, NSW Health has made considerable investments in telehealth initiatives, particularly the state-wide enabling infrastructure and tools needed to support integrated care. Other significant achievements include the establishment of a facilitated videoconferencing system, an increase in available bandwidth, and the capacity to share medical information and consultations across the state. Telehealth services have developed iteratively across LHDs and SHNs, resulting in differences in the uptake, maturity and integration of telehealth-enabled models of care across NSW.

Rapid advancements in information and communication technology (ICT) have created huge potential for re-shaping the way health care services are delivered. Globally, the health care sector is becoming ever more 'digitised', fuelled by the increasing availability and utilisation of e-Health applications (e.g. electronic medical records, digital imagery and video) and mobile health (m-Health) technologies, and the rapid drop in the cost of ICT. Through harnessing these evolving technologies, telehealth has the potential to play a significant role in improving the quality and equity of patient care and reducing inefficiencies in health systems. To maximise the potential benefits offered by telehealth into the future, it is important for NSW Health to anticipate the opportunities presented by and likely impacts of continued developments in health care ICT. Within this context, NSW Health recognised there was a need to review telehealth in NSW, particularly to understand how the benefits of investing in telehealth can be maximised to deliver high quality, safe, patient-centred care. NSW Health engaged Nous Group (Nous) to conduct such a review to provide NSW Health with a better understanding of the current state of telehealth and how the use of telehealth may be enhanced in the future. The review provides a description of the coverage, level of uptake and extent of integration of telehealth, enablers of and barriers to uptake, and the critical factors for successful telehealth-enabled models of care. The review has identified an overarching strategic priority for telehealth, supported by 22 recommendations for future oversight of funding, implementation and the strategic direction of telehealth in NSW. The review's key findings and recommendations, presented in a high level implementation plan, are set out in this Final report document which is accompanied by a companion Appendices document that provides further information and supporting evidence.

Nous conducted this review between October 2014 and March 2015. The review involved the collection and analysis of comprehensive qualitative and quantitative data in response to five key lines of enquiry. Data collection comprised a desktop review of documents provided by the NSW Ministry of Health (MOH) and broader literature, and an online survey and extensive consultations with a breadth of stakeholders from across the NSW health system and in other jurisdictions. The key findings of this report have been drawn from a synthesis of the data and are presented against the key lines of enquiry which have been grouped into three topics, as outlined in Figure 1.

Topic	Current state of the telehealth system in NSW	Successful models of telehealth	Enablers of and barriers to uptake of telehealth in NSW
Key line of enquiry	 (1) What is the profile of telehealth usage across the NSW health system? (2) How has the successful embedding of telehealth in models of care contributed to non-clinical elements of the health system? 	(3) Where telehealth has been successfully embedded in models of care, what are the contextual factors that have contributed to this success?	(4) What are the key enablers and barriers to uptake and effective use of telehealth?(5) What state-wide settings are required to optimise and sustain the use of telehealth in NSW?

Figure 1: Key line of enquiry by topic

1.1 Key review findings

The key review findings for each line of enquiry are outlined in sections 1.1.1 to 1.1.3. The organisational components of all telehealth-enabled models of care have been used to structure a number of the key findings. These components comprise governance, purpose and strategy, service and value delivery, external alliances and partnerships, business processes, workforce, culture, physical assets, organisation structure, roles and responsibilities and information management.

1.1.1 The current state of telehealth in NSW

Key lines of enquiry

- What is the profile of telehealth usage across the NSW health system?
- How has the successful embedding of telehealth in models of care contributed to non-clinical elements of the health system?

There are differing views about how telehealth is best defined

There are differing views among stakeholders about how best to define 'telehealth'. Consultation participants concurred there is a need for a single, agreed, state-wide definition of telehealth as this will support standardised language and understanding.

The roles and responsibilities of the key government bodies that manage, deliver and support telehealth services in NSW are not clearly understood

These bodies include the Commonwealth Department of Health and the following NSW Government bodies: NSW MOH, Agency for Clinical Innovation (ACI), eHealth NSW, HealthShare NSW, the Health Education and Training Institute (HETI) and LHDs/SHNs.

There is broad coverage and variable uptake of telehealth services in NSW

There is broad coverage of telehealth services across NSW. However, uptake into business as usual has been patchy across the state. Current telehealth initiatives operate across a range of clinical specialties, clinical service types and non-clinical uses, but often as pilots or separate 'telehealth' projects (as opposed to business as usual). Usage varies across the LHDs and SHNs, and by remoteness, types of health care facilities and individual clinicians. The most commonly used telehealth technology across these settings is videoconferencing.

The level of integration of telehealth services across NSW is low

The level of integration of telehealth services between LHDs, and service providers and receivers is relatively low. This is primarily due to inconsistencies in infrastructure causing a lack of interoperability.

The maturity of telehealth in NSW compared to other jurisdictions is mid-range

At a state-wide level, telehealth services in NSW are less mature than some other Australian states and territories (particularly Queensland and WA) and more mature than others. Internationally, Canada is viewed to be one of the most mature users of telehealth in the world. The approximate maturity of telehealth services in NSW compared with other, primarily Australian, jurisdictions is illustrated in Figure 2.



Figure 2: Approximate maturity of telehealth in NSW compared to other jurisdictions

Telehealth services can yield benefits for both receivers and providers

Telehealth-enabled models of care provide a range of benefits to patients, families and carers, health care workers and the health system. These largely relate to access to services, convenience, patient-centeredness, integration and quality of care, travel requirements, costs, support and education for health care workers, and a reduced burden on particular elements of the health system.

1.1.2 Successful models of telehealth

Key lines of enquiry

• Where telehealth has been successfully embedded in models of care, what are the contextual factors that have contributed to this success?

Nous used good practice examples of telehealth-enabled models of care and a review of the broader literature to distil common factors that are critical to the success of these types of models. These common success factors are outlined in Table 1. The most commonly cited success factors are indicated in bold.

Table 1: Critical success factors, at the model level, for effective telehealth-enabled models of care

Governance	 Telehealth is guided and supported by strong leadership Telehealth has clear governance arrangements that are embedded and understood. 			
Purpose/ Strategy	 Telehealth is: Driven by one or more specific clinical needs and therefore has a clearly defined purpose and is clinically relevant Applied to an existing model of care where it is well defined or to a new model of care Underpinned by a robust clinical care model Integrated into business-as-usual. 			
Service and value delivery	 Patient and locally focused Telehealth-enabled models of care are patient centred, focusing on the clinical care of patients rather than the technological aspects of the model Local relevance (i.e. there is consideration of local issues, needs and existing resources) Telehealth is accessible to the community and patients are supported to use telehealth Planning Implementation of the model is based on robust planning, which involves key stakeholders, the organisational partners and the local community from the beginning Medico-legal, privacy, ethical and other regulatory frameworks are assessed to determine whether they pose critical barriers to the delivery of telehealth services and relevant issues are addressed Monitoring Models are monitored and evaluated on an ongoing basis to support continuous improvement Funding A sustainable funding model underpins the service Funding arrangements do not act as disincentives to the use of telehealth There is adequate planning and upfront discussion about resourcing required at the central LHD/SHN level and the model of care level to ensure the service is sustainable (e.g. fully exploring all associated costs and how these costs will be funded). Models are flexible to allow them to adapt to changing clinical needs Consideration is given to redesigning a model of care to integrate a telehealth solution An iterative process is used to design a model of care. 			
External alliances and partnerships	 There is extensive consultation and collaboration with local government and non-government agencies There is strong cooperation between organisations involved in telehealth services. 			
Business processes	 Adequate clinician reimbursement is available for telehealth services There are resources dedicated to ensuring effective coordination Standard guidelines and manuals that clarify business rules and procedures and are developed and implemented to ensure consistency and ongoing operation, even with changes of personnel. 			
Workforce	 The model is supported by a sustainable workforce Staff receive adequate education and training in the new technology and model of care There is adequate administrative support Ongoing technical support is readily available. 			
Culture	 Effective change management (including a communications plan) supports the introduction of telehealth Support for telehealth Stakeholders perceive a need for telehealth and are engaged with the model Staff view telehealth as improving current care arrangements. 			

Physical assets	 There is adequate infrastructure in place to meet minimum requirements (e.g. sufficient bandwidth) Technology is: reliable easy to use convenient and easily accessible Technology aligns with the clinical service needs Technology is compatible across jurisdictions (including LHDs) to enable interoperability.
Organisation structure	• There is central service management and coordination.
Roles and accountabilities	 Dedicated and appropriately skilled telehealth coordinators are in place (typically at the LHD and SHN level who can be called up to provide support for individual models) Clinical champions are located at each site.
Information management	 Appropriate data collection mechanisms that enable measurement of costs and clinical benefits are in place Data is able to be transmitted and stored securely.

1.1.3 Enablers of and barriers to uptake of telehealth in NSW

Key lines of enquiry

- What are the key enablers and barriers to uptake and effective use of telehealth?
- What state-wide settings are required to optimise and sustain the use of telehealth in NSW?

A range of factors support or hinder the uptake of telehealth in NSW

Stakeholders and the literature identified a range of factors that either enable or hinder the uptake of telehealth in NSW. The most commonly cited enablers to or barriers are provided in Figure 3.

Enablers	Barriers
 Effective planning to ensure telehealth- enabled models of care are supported by adequate administrative support Strong change management to support uptake of telehealth Technology that is easy to use, convenient, quick to access, reliable, fit- for-purpose and cost-effective An effective telehealth coordination role that incorporates both technical and clinical knowledge, and both acts as the single point of contact for all telehealth related questions and provides support 	 Need for strong and clear central governance to provide strategic direction and guidance Financial disincentives created by the MBS discourage clinicians from using telehealth in situations where it is appropriate and would provide considerable benefits Uncertainty about the impact of ABF on funding for services provided using telehealth Need for access to adequate and appropriate technology, including bandwidth, to support quality and reliable communication Need for systems to support effective scheduling of telehealth consultations, including a global contact list

Figure 3: Most commonly cited enablers to and barriers of uptake of telehealth in NSW

A range of state-wide settings are required to optimise and sustain telehealth use in NSW

A range of state-wide settings are required to optimise and sustain the use of telehealth across the state. These have been informed by discussions with consultation participants, responses from survey participants and the broader literature, and draw from the identified enablers of and barriers to uptake of telehealth. The main state-wide settings are outlined in Table 2.

Table 2: State-wide settings for telehealth use in NSW

State-wide settings

A central governance body for telehealth that has a strategic role.

This body should utilise existing governance arrangements. Two options suggested by consultation participants include:

- using the existing eHealth Council, noting their terms of reference would need to be extended to cover clinical service delivery related to telehealth
- a subgroup of the eHealth Council, including relevant sector representatives from outside the Council, with a specific terms of reference related to telehealth that includes clinical service delivery focus.

The membership of this eHealth Council subgroup may be similar to that of the Queensland Telehealth Governance Committee which comprises representatives from the public health system, primary practice, non-government organisations, peak bodies and educational institutions.¹

¹ Representatives are from general practice (a rural GP chairs the Committee), Queensland Health (including Executive Directors, Senior Directors and Directors of relevant branches), Health and Hospital Services (a Chief Executive and a staff specialist), the state branch of

State-wide settings

The relationship of this new central body with other existing arrangements (including the Rural eHealth Governance Group and Telehealth Managers Forum) will need to be clarified. Similarly, the role of this central governance body and other relevant health central agencies will need to be clarified.

The operation of the central body should be consistent with the devolved model of health in NSW, allowing LHDs the flexibility to implement telehealth in a way that is appropriate to the local context.

A clearly articulated vision and strategic direction for telehealth in NSW.

The use of telehealth-enabled models of care across the state should be guided by a clear vision and strategic direction, against which success can be measured. The vision comprises a longer term goal. Given the current level of maturity of telehealth in NSW, there should continue to be a focus on telehealth as an enabling technology in the short to medium term.

The vision should consider how telehealth operates within the public sector as well as with service providers in the private and non-government sectors. The importance of considering this early was highlighted by consultation participants in jurisdictions with more mature delivery of telehealth than NSW (including Queensland and WA).

A suggested vision is as follows: Telehealth enables access to integrated, high quality, patientcentred and safe clinical care through remote delivery between a health professional and patient, or between health professionals.

An agreed definition of telehealth.

An agreed definition used across the state will ensure a common understanding of the scope of telehealth.

An effective approach to change management.

Effective change management will help to reduce clinician resistance to adopting telehealth technologies and support the embedding of telehealth into business-as-usual.

This may include the use of financial incentives. For example, QLD Health recognised the development of clinical champions would be critical to the introduction and uptake of telehealth and, from early on, identified specialist doctors interested in using telehealth providing them with financial incentives and other support to enable them to establish, grow and research telehealth models of care. Years later, these specialists now tend to be in senior roles (e.g. department heads) and have typically developed robust models of telehealth-enabled care, have contributed to the telehealth evidence base, have become strong telehealth champions and have developed strong relationships with QLD Health. Most of these clinicians still receive some funding from QLD Health but less than initially.

the Australian Medical Association, the Australian College of Rural and Remote Medicine, the University of Queensland, the Rural Flying Doctor Service, CheckUp and Mt Isa Centre for Rural and Remote Health.

State-wide settings

ABF arrangements that recognise telehealth activity at both the receiver and provider ends.

Modifications to NSW's ABF arrangements that count telehealth occasions of service at both the receiver and provider ends of a consultation would overcome some of the financial disincentives that currently discourage some clinicians from participating in telehealth. The ABF Taskforce within MOH reported they will be adopting a funding model that provides payment for both the provider and receiver end for non-admitted telehealth activity, given the Independent Hospital Pricing Authority (IHPA) has agreed to introduce this payment model in 2015/16. As discussed in section 1.1.1, Queensland has modified its ABF arrangements to address this issue and IHPA pricing rules will change in NEP15.

Funding and a strategic approach to support the establishment of new innovative telehealthenabled models of care.

Innovative telehealth-enabled models of care may not be able to be implemented without funding support. Victoria has established an innovation fund which is intended to support the development of new telehealth projects as well as the expansion of selected existing project and evaluation of existing telehealth projects. Queensland also provides one-off incentive funding for projects.

A strategic approach to identifying and disseminating information about models of care that are innovative, successful and sustainable will support the uptake of innovation more broadly across the state. For example, an element of such an approach may be that ACI is planning to commence a community of practice for clinicians across NSW.

State-wide provision of the basic technology infrastructure required to enable the use of telehealth.

The provision of the basic technology hardware and software, particularly that which provides adequate bandwidth, across the state is required to enable the use of telehealth, facilitate interoperability of systems and support effective scheduling.

State-wide policy statements that clarify telehealth-related issues.

Particular issues highlighted to require clarity relate to medico-legal, ethical, confidentiality and security concerns.

The inclusion of KPIs in service agreements with all LHDs/SHNs.

Measurement of performance against such KPIs would actively encourage the uptake of telehealth in LHDs/SHNs. KPIs should encourage the use of telehealth only where clinically appropriate.

Queensland has included telehealth KPIs in service agreements with some Health and Hospital Services. For example, the service agreement between Central West Health and Hospital Service and Queensland Health includes the following KPI – "a target of a 10% increase in the number of non-admitted patient telehealth service events reported above the 2013/14 baseline "².

² Queensland Health (2014), Central West Hospital and Health Service Service Agreement 2013/2014 – 2015-2016 December 2014 Revision, [Online], available at <u>www.health.qld.gov.au/system-governance/health-system/managing/default.asp</u>, [Accessed 22 January 2015]

State-wide settings

Data capture mechanisms that enable collection and analysis of telehealth data across NSW.

This requires the state-wide use of an identifier for telehealth-enabled occasions of service and is important for service planning and continuous improvement.

From a patient perspective, there is currently little evidence (other than anecdotal evidence) about what the telehealth experience looks like. As the key recipients of clinical telehealth services, it is important to determine if telehealth is enabling their needs to be met and where there are areas for improvement. As such, mechanisms to capture data about patient experience are required.

The provision of core telehealth training for relevant NSW Health staff.

The provision of core telehealth training across the state will help to increase staff awareness, understanding and uptake of best clinical practice telehealth-enabled models of care.

1.2 Recommendations

The review identified a single overarching strategic priority for telehealth in NSW, identified in Figure 4, and 22 supporting recommendations to guide future oversight of funding, implementation and the strategic direction of telehealth in NSW.

Figure 4: Overarching strategic priority for telehealth in NSW

LHDs/SHNs are responsible for driving local uptake of telehealth-enabled models of care that are embedded into business as usual and all NSW Health agencies with a role in telehealth are responsible for enabling the LHDs/SHNs to do this.

The 22 recommendations are presented in a high level implementation plan which stages the implementation of these recommendations over two key phases, as outlined in Figure 5.



The recommendations presented here (and in section 5) should be read in the context of the following:

- These recommendations have not been costed and are for consideration by NSW Health. Accepted recommendations will need to be implemented within existing resources.
- These recommendations will *contribute* to achieving the desired state of telehealth usage across NSW. They do not represent an exhaustive list and there are other actions key health organisations and agencies will need to take to reach the desired state.

The recommendations and high level implementation plan are presented in Table 3.

Component of organisation architecture	Immediate actions (to be implemented prior to 30 June 2015)	Short term actions (progressive implementation from the 2015-2016 financial year)
	Prepare	Action
	 <i>MOH</i> to coordinate with key stakeholders to consider a central body to act as a peak governance body for telehealth. It should utilise existing governance arrangements, have responsibility for telehealth governance at a strategic level and could have the following functions: overseeing implementation of the 	
	recommendations from this strategic review of telehealth	
	 setting direction for telehealth in NSW monitoring telehealth developments at the national level, particularly IHPA determinations 	
Governance	 encouraging the uptake of telehealth through development of an implementation plan and a measurement framework to be overseen by this group (with future inclusion of KPIs in service agreements for all LHDs) 	
	 monitoring delivery of telehealth across the state to ensure it is occurring in a manner consistent with the articulated direction 	
	 ensuring an effective change management approach at the state level to support embedding of telehealth into business-as- usual (including through the use of financial incentives) 	
	 driving local innovation and prioritisation of telehealth-enabled models of care, including exploring funding mechanisms to support this 	
	 providing guidance about key activities that should be standardised across the state (e.g. secure information storage, data collection) 	
	 overseeing the development a core training package about best clinical practice in relation to telehealth, to be developed and delivered by HETI. 	
	The operation of the central body would be consistent with the devolved model of health in NSW, allowing LHDs the flexibility to implement telehealth in a way that is appropriate to the local context.	

Table 3: High level implementation plan

Component of organisation architecture	Immediate actions (to be implemented prior to 30 June 2015)	Short term actions (progressive implementation from the 2015-2016 financial year)
	Prepare	Action
Purpose/ Strategy	<i>B. NSW Health</i> to adopt an agreed definition of telehealth and to consider adopting the following definition: telehealth is the delivery of health care at a distance using information and communications technology ³ .	C. Peak governance group ⁴ to articulate a vision for telehealth in NSW and measures of success. The vision should include how telehealth operates within the public sector as well as with key external health stakeholders including General Practitioners (GPs), private specialist practices, Residential Aged Care Facilities and non- government organisations (NGOs).
Service and value delivery	D. ACI and MOH ABF Taskforce to continue to provide clarification about the ABF and how it applies to telehealth, with ACI to include this clarification in the final version of the ACI Telehealth Guidelines.	 E. MOH to consider making representations to the Commonwealth Minister for Health to amend the Medicare Benefits Schedule to remove the financial disincentives created by the MBS, particularly to: extend eligibility for telehealth billing to patients who live within metropolitan (RA1 classified)⁵ areas and who have difficulty accessing health care services (e.g. people with a disability) enable GPs to bill for patient consultations conducted using telehealth enable nurse practitioners to bill for patient consultations conducted using telehealth. enable clinicians providing consultation as part of a multi-disciplinary team to bill for telehealth consultations enable allied health professionals to bill for patient consultations using telehealth enable billing by clinicians consulting with each other about a patient when the patient is not present (e.g. consultations between a GP and a specialist, consultations between a specialist and a sub-specialist).
	F. ACI to incorporate the best practice use of telehealth in models of care and critical success factors identified in this review in the revised ACI Telehealth Guidelines.	<i>G. MOH</i> to continue to work with IHPA to explore ABF funding of telehealth activities for Emergency Departments and admitted patients.
		<i>H. MOH</i> to clarify to NSW Health system stakeholders that from 1 July 2015 NSW Health will fund non-admitted telehealth activity at both the provider and receiver end.

³ Wade, V. (2014), How to make telehealth work: defining telehealth processes and procedures, [Online], available at <u>http://www.e-</u> unicare.com.au/wp-content/uploads/2013/06/unicare_ebook.pdf, [Accessed 5 January 2015]

See recommendation 'A' under Governance.

⁵ This excludes patients who live in eligible residential aged care facilities or who are at an eligible Aboriginal Medical Service/Aboriginal Community Controlled Health Service as these patients are already eligible for telehealth billing.

Component of organisation architecture	Immediate actions (to be implemented prior to 30 June 2015)	Short term actions (progressive implementation from the 2015-2016 financial year)
	Prepare	Action
		I. eHealth and ACI to explore how best to capture and communicate innovation in telehealth- enabled models of care. Example mechanisms include informal information exchange through the Telehealth Managers Forum and information exchange through the ACI's Innovation Exchange portal.
		J. LHDs/SHNs to require telehealth-enabled models of care to be evaluated at a minimum within five years of implementation and then at regular intervals to support continuous improvement in line with evaluation best practice.
External alliances and partnerships		K. LHDs/SHNs to identify and build effective alliances and partnerships to support best practice telehealth-enabled models of care. These alliances and partnerships should include Primary Health Networks, GPs, providers of private specialist services, Residential Aged Care Facilities, other local health providers who may receive input via telehealth, NGOs that deliver services, and organisations that can provide particular expertise (e.g. universities and/or software developers).
Business processes		L. MOH to develop a policy statement to address perceived medico-legal, ethical, confidentiality and/or security issues (including ownership and transfer of patient records between hospitals and external care providers, and ownership of digital photography records).
		<i>M. LHDs/SHNs</i> to consider the value of inclusion of KPIs in contracts with individual clinicians.
Workforce		<i>N. HETI</i> to provide core training for relevant NSW Health staff about best clinical practice in relation to telehealth (e.g. medico-legal, ethical, confidentiality, security issues). Development of the training package should be overseen by the peak governance group ⁶ .
Culture		<i>O. LHDs/SHNs</i> to design and implement an effective change management strategy when establishing new telehealth-enabled models of care.

⁶ See recommendation A under *Governance*.

Component of organisation	Immediate actions (to be implemented prior to 30 June 2015)	Short term actions (progressive implementation from the 2015-2016 financial year)
architecture	Prepare	Action
		P. eHealth to continue to focus on establishing the basic infrastructure to enable telehealth to operate state-wide. This includes ensuring all locations have access to adequate bandwidth and infrastructure is standardised to the extent that it enables interoperability of systems across LHDs/SHNs.
Physical assets	assets	<i>Q. eHealth</i> to implement mechanisms to identify and support the uptake of new technologies to provide appropriate telehealth solutions for clinical problems, particularly personal devices such as mobile phones and tablet computers.
		<i>R. Health Infrastructure (NSW)</i> to consider telehealth in planning and design as part of the Australasian Health Facility Guidelines (AusHFG) to ensure the necessary technology is in place or can easily be added to new facilities, and appropriate facilities are available for the provision of services via telehealth.
Organisation structure		 S. LHDs/SHNs to prioritise a dedicated role/s (e.g. telehealth coordinator role) with the following capabilities and responsibilities to drive the uptake of telehealth within their jurisdiction: providing oversight of telehealth within the LHD/SHN driving the strategic direction for telehealth within the LHD/SHN facilitating, supporting and promoting best practice uptake of telehealth with the LHD/SHN through clinician engagement, change management and risk minimisation providing support to LHD/SHN staff who wish to investigate/establish a new telehealth-enabled model of care supporting the evaluation and continuous improvement of telehealth services developing and maintaining knowledge of telehealth technologies in a clinical context to support the provision of safe, reliable, patient focused care ensuring collaboration between the strategic, technical and clinical elements of telehealth within the LHD/SHN collaborating with staff in other LHDs/SHNs with a similar role to share learnings and innovative ideas

Component of organisation architecture	Immediate actions (to be implemented prior to 30 June 2015)	Short term actions (progressive implementation from the 2015-2016 financial year)
	Prepare	Action
Roles and accountabilities		<i>T. Peak governance group</i> ⁷ to clarify the roles and responsibilities of the MOH, eHealth, ACI, HealthShare NSW, HETI and LHDs/SHNs in relation to telehealth and ensure these are clearly communicated.
Information management		 <i>U.</i> eHealth to implement technology solutions to enable effective scheduling for telehealth consultations. This may involve finalising a global contact list, implementing a state-wide scheduling system and/or providing guidance on standardisations that will enable the different existing scheduling systems to talk to each other. <i>WOH and eHealth</i> to investigate how best to capture sufficient data to enable an analysis of telehealth usage across NSW and its benefits, including the need for an identifier for telehealth consultations. <i>Bureau of Health Information</i> to consider collecting information on patient experience of telehealth through the NSW Patient Surveys.

⁷ See recommendation A under *Governance*.

2 Background and purpose

Background

Rapid advancements in information and communication technology (ICT) have created huge potential for re-shaping the way health care services are delivered. Globally, the health care sector is becoming ever more 'digitised', fuelled by the increasing availability and utilisation of e-Health applications (e.g. electronic medical records, digital imagery and video) and mobile health (m-Health) technologies, and the rapid drop in the cost of ICT. Through harnessing these evolving technologies, telehealth has the potential to play a significant role in improving the quality and equity of patient care and reducing inefficiencies in health systems. To maximise the potential benefits of telehealth into the future, it is important for NSW Health to anticipate the opportunities presented by and likely impacts and continued developments in health care ICT, the eHealth and telehealth industries.

Telehealth usage in NSW commenced in the mid-1990s and aimed to improve access to, equity and quality of health services particularly for rural and remote communities. Since then, NSW Health has made considerable investments in telehealth. At the same time, telehealth services have developed iteratively, resulting in significant differences in the use of telehealth and implementation of telehealth-enabled models of care across the state.

NSW Health has invested and continues to invest significantly in telehealth initiatives, particularly in the state-wide enabling infrastructure and tools needed to support integrated care (NSW Health, 2014). Investments in infrastructure such as the Health Wide Area Network are expected to improve security and performance, both of which are critical enablers to the delivery of telehealth (NSW Health, 2014). Other significant investments include the establishment of facilitated video-conferencing services across the health system, with over 600 end-points in 2012 (Minister for Health, 2012), an increase in bandwidth, and the capacity to enable the sharing of medical information and consultations between metropolitan, regional, and rural hospitals and clinicians (Minister for Health, 2013).

NSW Health's ongoing commitment to improving and expanding telehealth is set out in a number of strategic documents. *The NSW State Health Plan: Towards 2021* commits NSW to building and expanding investment in eHealth solutions (including telehealth) to support communication and connectivity across the health system (NSW Ministry of Health, 2014). The *NSW Rural Health Plan: Towards 2021* commits NSW to strengthening the capacity of rural health services through three key priority areas, including through improving rural eHealth (NSW Ministry of Health, 2014). The *Blueprint for eHealth in NSW*, released by the state's Minister for Health in December 2013, formalised the establishment of eHealth NSW as a separate entity and outlined the NSW Government's commitment to invest \$1.5 billion in a range of eHealth initiatives over the ten years from 2013 (NSW Ministry of Health, 2013). eHealth NSW is in the process of developing a new *eHealth Strategic Plan* to guide planning, strategy, program implementation and operations of eHealth initiatives, including those relating to telehealth.

The MOH recognised there was a need to review telehealth in NSW, in particular how the benefits of its investment in telehealth can be maximised to ensure the delivery of high quality, safe patient-centred care.

Purpose of the review

Within this context, the MOH engaged Nous to conduct a review of telehealth services across NSW to provide NSW Health with a better understanding of the current state of telehealth and recommendations for its future strategic direction and oversight. The review focused on the clinical applications of telehealth.

More specifically, the review has provided:

- a description of the coverage, level of uptake and extent of integration of telehealth
- examples of good practice in telehealth in NSW, nationally and internationally
- a description of the factors that are critical to the success of telehealth-enabled models of care
- an outline of enablers of and barriers to uptake, the latter including infrastructure, clinical and performance issues that require consideration
- identification of state-wide system requirements needed to embed successful models of telehealth in a wide range of settings
- recommendations for future oversight of funding, implementation and strategic direction for telehealth in NSW, including a high-level implementation plan.

This strategic review focused on how NSW Health can optimise and leverage existing clinical telehealth activity in NSW. A detailed review of telehealth usage for non-clinical purposes was outside the scope of this review.

Structure of this report

In this Final Report on the Strategic review of telehealth in NSW, Nous provides:

- key findings on the coverage, level of uptake and extent of integration of telehealth, enablers of and barriers to uptake, and the critical factors for successful telehealth-enabled models of care
- recommendations for future oversight of funding, implementation and the strategic direction of telehealth in NSW, accompanied by a high level implementation plan that sets out timeframes for implementation.

This *Final Report* is accompanied by a companion *Appendices* document. The *Appendices* document includes the detailed methodology, data collection plan, stakeholder engagement plan, scoping paper, and supplementary data to support the key findings and recommendations.

3 Methodology overview

The review was conducted in three stages over the six months from October 2014 to March 2015, as shown in Figure 6. Detailed information about the methodology, including data limitations, is included in in Appendix A in the *Appendices* companion document.



Figure 6: Stages of the review of telehealth in NSW

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The review was guided by five key lines of enquiry, as outlined in Figure 7.



These key lines of enquiry informed the review's desktop research and data collection activities, and guided the synthesis of the key findings. The three data collection activities are summarised in Figure 8.

Figure 8: Summary of data collection activities



Figure 7: Key lines of enquiry

4 Findings

Overall, the review found telehealth provides many demonstrated benefits for patients, their families and carers, health care workers and the broader health system. Significant funds and effort have been invested in telehealth in NSW to support high quality, patient-centred care. Telehealth is being used to some extent in all LHDs and SHNs, with the extent of uptake and breadth of telehealth-enabled services differing by LHD/SHN. In addition, there is more to be done so that telehealth is business as usual across NSW. Metropolitan, rural and remote regions of NSW experience similar barriers and enablers regarding telehealth uptake and sustained usage. At a state-wide level, the maturity of telehealth services in NSW compared to other Australian and international jurisdictions is mid-range.

The review has identified a number of key findings against the key lines of enquiry and these have informed the recommendations contained in section 5. These key findings are set out as follows:

- The current state of telehealth in NSW (section 4.1)
 - What is the profile of telehealth usage across the NSW health system?
 - How has the successful embedding of telehealth in models of care contributed to nonclinical elements of the health system?
- Successful models of telehealth (section 4.2)
 - Where telehealth has been successfully embedded in models of care, what are the contextual factors that have contributed to this success?
- Enablers of and barriers to uptake of telehealth in NSW (section 4.3)
 - What are the key enablers and barriers to uptake and effective use of telehealth?
 - What state-wide settings are required to optimise and sustain the use of telehealth in NSW?

Nous' organisation architecture framework, presented in Figure 9, summarises the organisational components of any telehealth-enabled model of care. It has been used to structure the key review findings in relation to critical factors for a successful model (in section 4.2), and factors that hinder or support the uptake of telehealth-enabled models of care (in section 4.3).



4.1 The current state of telehealth in NSW

Key lines of enquiry	Key findings
	Definition of telehealth (section 4.1.1)
What is the profile of telehealth usage across the NSW health system?	 There are differing views about how telehealth is best defined across NSW health settings.
	Roles and responsibilities for telehealth (section 4.1.2)
	 The roles and responsibilities of the key government bodies that manage, deliver and support telehealth services in NSW are not clearly understood.
How has the successful embedding of telehealth in models of care contributed to non- clinical elements of the health system?	Coverage and uptake (section 4.1.3)
	 There is broad coverage of telehealth services across NSW and while uptake has been patchy, there is more to be done so that telehealth is business as usual.
	 Telehealth usage varies across the LHDs and SHNs, and by remoteness, types of health care facilities, clinical specialities, clinical services and individual clinicians.
	 While telehealth infrastructure varies considerably across LHDs and SHNs, videoconferencing is the most commonly used telehealth technology.

Figure 9: Nous' organisation architecture framework

Key lines of enquiry	Key findings
	Level of integration of telehealth-enabled services (section 4.1.4)
	 The level of integration of telehealth-enabled models of care across the state is relatively low.
	Maturity of telehealth (section 4.1.5)
	 Overall, the maturity of telehealth services in NSW compared to other Australian and international jurisdictions (particularly Queensland, WA and Canada) is mid-range.
	Benefits of telehealth services (section 4.1.6)
	 Telehealth-enabled models of care provide a range of benefits to patients, families and carers, health care workers and the health system. These largely relate to access to services, convenience, patient-centeredness, integration and quality of care, travel requirements, costs, support and education for health care workers, and a reduced burden on particular elements of the health system.

Each of these key findings is discussed in further detail in sections 4.1.1 to 4.1.6.

4.1.1 There are differing views about how telehealth is best defined

There are differing views across the NSW health system about the most appropriate definition of 'telehealth'. For example, some stakeholders included telephone calls and web-based information (e.g. the Healthdirect National Health Services Directory) as part of telehealth, while other stakeholders deemed these outside the definition of telehealth. Consultation participants concurred there is a need for a single, agreed, state-wide definition of telehealth as this will support standardised language and understanding.

The review used the following working definition of telehealth (drawn from the ACI's draft *Guidelines for the use of telehealth for clinical and non-clinical settings in NSW*): telehealth is the secure transmission of images, voice and data between two or more units via telecommunication channels, to provide clinical advice, consultation, monitoring and training and administrative services (Agency for Clinical Innovation, 2014a). A simpler and more suitable definition may be that used by the telehealth expert Dr Victoria Wade: telehealth is the delivery of health care at a distance, using information and communications technology (Wade, 2014).

4.1.2 Government body roles and responsibilities in telehealth are unclear

Several NSW and Commonwealth Government bodies have roles and responsibilities in managing, delivering and supporting telehealth services in NSW. Consultation participants indicated these roles and responsibilities are not clearly understood. Both consultation participants and the literature agree it is critical these organisations have strong linkages and functioning working relationships to ensure successful and well-coordinated telehealth service delivery.

Figure 10 summarises the roles of the key government bodies, with further detail about each provided below.



Figure 10: Roles of key government bodies in telehealth in NSW

The Commonwealth Department of Health provides policy direction and funding for telehealth services in all Australian jurisdictions. This includes managing and distributing reimbursements for telehealth services under the MBS, funding provided through ABF (Agency for Clinical Innovation, 2014a), and provision of purpose-specific grants (e.g. the Telehealth Pilots Programme) (Department of Health (Commonwealth), 2014).



The **Independent Hospital Pricing Authority** (IHPA) is responsible for the determination of a National Efficient Price, a key component of ABF.



Six main NSW Government bodies have roles and responsibilities related to telehealth. The **MOH** predominantly provides state-wide strategic oversight, policy, planning and service development. MOH consultation participants indicated MOH's focus to date has largely been

on providing the funding for telehealth equipment, rather than integrating technology into models of care. Consultation participants commented that, going forward, the MOH should have strategic, policy, funding, reporting and performance management roles.

ACI is responsible for supporting telehealth models of care and developing protocols for service delivery. ACI has developed a Telehealth Resource Package which explains how and why telehealth is used, and provides guidance on how to implement telehealth services at a local level (Agency for Clinical Innovation, 2014b). ACI has also developed a set of state-wide telehealth clinical guidelines for those using telehealth in NSW (currently in draft form) which complements the ACI Telehealth Resource Package (Agency for Clinical Innovation, 2014a).



eHealth NSW has responsibility for leading state-wide eHealth strategy, planning and project delivery. It ensures the infrastructure is in place to support telehealth (particularly videoconferencing capability) and enables technical solutions to clinical problems for LHDs, SHNS and clinicians (according to eHealth NSW consultation participants). eHealth NSW is in

the process of developing an eHealth Strategic Plan which will guide investment into expanding existing programs and new initiatives (NSW Ministry of Health, 2013).



HealthShare NSW, of which eHealth NSW was formerly a part, provides shared service technical advice and support for telehealth services.



HETI has responsibility for developing and delivering health related education in NSW. Currently, HETI does not currently provide any telehealth specific training.⁸



LHDs and SHNs have responsibility for funding, designing and delivering telehealth-enabled models of care. Funding for telehealth services will be almost entirely accommodated within LHD and SHN budgets from July 2014.

4.1.3 There is broad coverage and variable uptake of telehealth services in NSW

Overall, there is broad coverage of telehealth services across the state and while uptake has been patchy, there is more to be done so that telehealth is business as usual. While there is a broad range of telehealth initiatives in operation across NSW that cover a variety of clinical specialties, clinical service types and non-clinical uses, they are typically still peripheral to business as usual service delivery (being operated as pilots or separate 'telehealth' projects). Telehealth is increasingly being used to improve access to specialist expertise delivered in a more patient-centred manner but its uptake remains patchy across NSW.

This section describes how the uptake of telehealth varies by LHD and SHN, remoteness, type of health care facility, clinical speciality, clinical service and individual clinicians, and the types of technology in use across the state.

The level of uptake of telehealth-enabled models of care varies across LHDs and SHNs

Telehealth is being used to some extent in all LHDs and SHNs but the breadth of telehealth-enabled services differs by LHD and SHN. Some are using telehealth-enabled models of care across a wide range of specialities (e.g. HNELHD) while in others there are far fewer specialties utilising telehealth (e.g. SWSLHD).

⁸ Some of the recommendations for future strategic direction and oversight of telehealth in Section 5 of this report relate to telehealthspecific training and would be HETI's responsibility to implement.

Stakeholders across the NSW Health system identified HNELHD and Nepean Blue Mountains LHD (NBMLHD) as leaders in the use of telehealth-enabled services. HNELHD uses telehealth across a large number of clinical specialities (primarily to deliver outpatient services) as well as for clinical education, training and workforce support (Hunter New England Area Health Service, 2010). HNELHD consultation participants reported it is the only LHD that has a stand-alone telehealth strategy which sets out the strategic directions for clinical telehealth use within the LHD and has recently implemented Australia's first fully integrated telehealth scheduling system.

In NBMLHD, the Nepean Telehealth Technology Centre was established at Nepean Hospital in 2012 to develop, evaluate and implement best practice telehealth technology through piloting cliniciansponsored telehealth-enabled models of care⁹. The centre also uses telehealth for non-clinical purposes including undertaking multidisciplinary team meetings and education. Staff at the centre work with clinicians in the acute care, primary care and community care sectors, universities, the Commonwealth Government and the non-government sector to explore and develop telehealth opportunities (Minister for Health, 2012).

Telehealth is more likely to be used outside of metropolitan areas

Telehealth is more widely used in regional, rural and remote regions of NSW, particularly as a means of overcoming difficulties in accessing health care and the shortage of health care professionals experienced in these areas (Medical Technology Association of Australia, 2012). Furthermore, telehealth consultations can only be billed through Medicare for patients who reside outside a metropolitan area (i.e. outside an RA1 classified area as per the ASGCRA classifications), resulting in a financial disincentive to using telehealth services with patients who live within a metropolitan area.

The wider use of telehealth outside of metropolitan areas is also supported by the survey results. Of the respondents who indicated they use telehealth in their current role, 78% (302 respondents) indicated they predominantly work outside metropolitan Sydney, with 44% (112 respondents) predominantly working in large regional centres and 31% (84 respondents) predominantly working in semi-rural or rural areas (see Figure 11).



Figure 11: Survey respondents who indicated they use telehealth in their current role by geographic region in which they predominantly work (n=273)

⁹ These models of care have included use of purpose-built apps to support outreach nurses attending to patients in their homes and the provision of paediatric allied health care; a mobile health solution to provide haemodialysis data from patients in their homes to medical staff in clinics; video consultations to support time critical stroke care and to link patients in residential aged care facilities to specialists; and a remotely operated robotic system to perform surgery.

Telehealth facilities are available in the majority of hospital and community health centres, and tend to be concentrated in public health care facilities

Recent aggregate data on the number of health care facilities using telehealth in NSW is limited, although ACI reported that telehealth facilities are available in the majority of hospitals and community health centres (Agency for Clinical Innovation, 2014b). Survey responses are consistent with this finding: 59% of respondents (284 respondents) indicated they predominantly work in a principal referral, major or district hospital, and 20% (96 respondents) indicated they predominantly work in a community health facility (see Appendix F in the *Appendices* companion document for more detail). Based on the most recent state-level data available (2010), there were over 240 health care facilities offering telehealth services (Gray, et al., 2011).

According to the Medical Technology Association of Australia, telehealth services are concentrated in public health care facilities (Medical Technology Association of Australia, 2012). This is supported by the survey results which indicated 89% of respondents (430 respondents) predominantly work in a public health care facility (see Appendix F in the *Appendices* companion document for more detail).

Telehealth services are offered across a wide range of health specialities, and are used for both clinical and non-clinical purposes

Telehealth-enabled models of care are used across the spectrum of health specialties and more commonly in aged care, chronic disease management, mental health services, wound management and oncology as indicated in the literature and supported by survey responses (see Appendix G in the *Appendices* companion document for all specialties). The literature and consultation participants also indicated telehealth services are commonly used in neurology (especially stroke) and paediatrics. A detailed list of telehealth services in operation across NSW is included at Appendix H in the *Appendices* companion document (collated from consultations and the literature).

Telehealth is also widely used for non-clinical purposes. Survey respondents indicated the most common types of non-clinical services they use, support, coordinate or manage telehealth for are administrative tasks (68%, 184 respondents) and providing or receiving education (50%, 135 respondents), as illustrated in Appendix G in the *Appendices* companion document.

Clinical telehealth services are most used for the provision of specialist care consultations

The majority of survey respondents (59%, 140 respondents) indicated they use, support, coordinate or manage telehealth services for specialist care consultations. Between 20-30% of survey respondents indicated they use, support, coordinate or manage telehealth services for outpatient clinics, primary care consultations and time critical treatment (see Figure 12).



Figure 12: Clinical services for which survey respondents indicated they use, support, coordinate or manage telehealth services for (n=417)¹²

Younger clinicians may be more comfortable with using telehealth technology

Consultation participants in some LHDs have found (in some instances) that younger clinicians tend to be more amenable to using telehealth in their practice than older clinicians because they are more likely to be familiar and comfortable with using the technology. However, at least one LHD reported some resistance among younger clinicians to using telehealth to provide services as they perceive that telehealth increases their workload (primarily due to the additional required administrative preparation).

While telehealth infrastructure varies considerably across LHDs and SHNs, videoconferencing is the most widely used telehealth technology

Consultation participants indicated telehealth infrastructure, including bandwidth, hardware and software, differs significantly across LHDs and SHNs and has resulted in system incompatibilities and variability in the quality of audio-visual connections. Videoconferencing is overwhelmingly the most common telehealth technology used in NSW: there were over 600 videoconferencing endpoints and at least 70 cameras in EDs in 2012 (Minister for Health, 2012). Eighty-three percent of survey respondents (276 respondents) indicated they are using video-conferencing equipment for telehealth purposes. This is far greater than any other technology use, with survey respondents indicating the next most commonly used telehealth technology is apps on mobiles or tablets (22%, 75 respondents), closely followed by image transfer and data transfer (see Figure 13). This is consistent with the views expressed by consultation participants.

¹² Note 'n' refers to the total number of respondents for this question, whilst 'x' refers to the number of respondents who selected a particular response option.



Figure 13: Type of telehealth technology survey respondents indicated they use, support, coordinate or manage in their current role (n=334)¹³

Type of telehealth technology

4.1.4 The level of integration of telehealth services across the state is low

The level of integration of telehealth-enabled models of care between LHDs, and service providers and receivers across the state is relatively low. This is primarily due to inconsistencies in infrastructure which result in a lack of interoperability. Consultation participants provided a number of specific examples to demonstrate the difficulties faced with integrating telehealth-enabled services including the:

- incompatibility of the range of videoconferencing and/or telehealth scheduling systems being used by LHDs and SHNs – for example, in relation to videoconferencing systems, HNELHD uses Scopia, St Vincent's Hospital uses Vidyo and Northern Sydney LHD (NSLHD) uses Cisco-Jabba
- absence of a state-wide contact list of clinicians, other health staff and facilities results in scheduling difficulties
- incompatibility of systems between SA and NSW which have resulted in a SA oncologist being unable to access patient electronic medical records and experiencing difficulties in accessing radiology results for patients in Broken Hill. SA Health uses Picture Archiving Communication System radiology software while Broken Hill uses Central Data Network (CDN) radiology software – the oncologist has set up a dedicated CDN terminal in SA solely to enable him to view radiology results for Broken Hill patients
- accessibility issues previously experienced by the RFDS, which were not able to access FWLHD systems due to technical issues such as firewalls – these have now been overcome.

¹³ The total percentage adds to greater than 100% as respondents were able to select multiple options for this question. The percentage is based on the total number of respondents, rather than the total number of responses. Note 'n' refers to the total number of respondents for this question, whilst 'x' refers to the number of respondents who selected a particular response option.

4.1.5 The maturity of telehealth in NSW compared to other jurisdictions is mid-range

At a state-wide level, telehealth services in NSW are less mature than some other Australian states and territories (particularly Queensland and WA) and more mature than others (see Figure 14). Internationally, Canada is viewed to be one of the most mature users of telehealth in the world.

Recently, there has been a rapid increase in the uptake of telehealth services across Australia, with a 20fold increase in Medicare claims in the 30 months prior to the first quarter of 2014 (Blount, 2015). However, despite significant evidence about the benefits of using telehealth-enabled models of care, historically the uptake into routine operations in Australia has been slow, uneven, and fragmented (Jang-Jaccard, et al., 2014; Mauldon, 2007; Wade, et al., 2010).

Telehealth services commenced in most Australian states and territories in the mid to late 1990s, encouraged by the provision of Commonwealth Government project funding (Health and Community Services Committee, 2014). In some states and territories, telehealth is centrally coordinated, while in others it is managed by primary care providers, hospitals or rural 'alliances' (Bywood, et al., 2013). In most states and territories there is, at a minimum, 'large and well equipped videoconferencing networks' (Gray, et al., 2011).

Queensland and WA have relatively well established state-wide telehealth networks, with broad coverage across a wide range of specialities. Conversely, telehealth services in the NT, ACT, SA and Tasmania are less mature. Victoria is at a similar stage to NSW in terms of the maturity and coverage of its telehealth network. Even in the jurisdictions with less well developed telehealth services, some specific telehealth-enabled models of care are relatively mature and well integrated (e.g. telepsychiatry in SA and telestroke in Victoria). According to recent Medicare claims figures, telehealth usage in Queensland and NSW accounted for 60% of all telehealth usage in Australia (based on the number of Medicare claims processed between July 2011 and March 2014) (Blount, 2015).

Canada was consistently cited in the literature and reported by consultation participants as a leader in the use of telehealth. Telehealth continues to be an area of rapid expansion, both in terms of volume and type of services, in health care and health education in Canada. Telehealth networks are established across all its provinces and territories (Health and Community Services Committee, 2014).

The approximate maturity of telehealth services in NSW compared with other, primarily Australian, jurisdictions is illustrated in Figure 14 and described in Table 4. More detailed information about telehealth usage in each of the selected jurisdictions can be found in Appendix I (in the *Appendices* companion document). Appendix I also contains information about some Australia-wide telehealth services and telehealth services in three other selected international jurisdictions.



Figure 14: Approximate maturity of telehealth in NSW compared to other jurisdictions

Table 4: Summary of telehealth usage in selected jurisdictions

Queensland	 Queensland has been using telehealth for more than two decades and is often considered a leader in the field (Armfield, et al., 2014). Telehealth services are well-established, well-integrated state- wide and available across a wide range of clinical specialities (Health and Community Services Committee, 2014). Consultation participants reported telehealth has become a priority for the state. There has been considerable investment in infrastructure (particularly a videoconferencing network) to enable telehealth. Telehealth is mainly used by public hospitals, community health centres, Aboriginal Medical Services (AMS) and the RFDS (where 20% of all services are delivered through telehealth) (Gray, et al., 2011). Queensland Health manages over 2000 telehealth systems across Queensland, including 656 videoconferencing systems which are mainly used for clinical activity (Armfield, et al., 2014). Four specialties account for 84% of admitted patient telehealth events: intensive care, rehabilitation, geriatric and general medical and surgical (Health and Community Services Committee, 2014).
Western Australia	 Telehealth is broadly used across the state and encompasses a range of applications and specialities. Consultation participants reported telehealth services in WA have been underway in various forms for around 15 years, supported by injections of federal and state funding. Telehealth services in WA are managed through individual hospitals, although the WA Country Health Service plays a role in leading and promoting the use of telehealth across the state (Department of Health (WA), 2011; Gray, et al., 2011). WA has an extensive network of video-conferencing facilities. Telehealth is used across a range of specialities including wound care, radiology, chronic disease care, emergency care, outpatient care and psychiatry services (Department of Health (WA), 2011; Bahaadinbeigy, et al., 2010). It is also used for educational purposes. WA's telepsychiatry and teleradiology programs are particularly well-established (Gray, et al., 2011).
Victoria	 Telehealth in Victoria is at an earlier stage of maturity than some other states and territories in its provision of telehealth on a state-wide scale (McDonald, 2014a). Telehealth is currently managed through the five regional Rural Health Alliances (RHA) (Health and Community Services Committee, 2014). The most established is the Grampians RHA which consists of 40 sites across Western Victoria. Historically, telehealth has mainly been used to link rural and remote health care facilities with specialists in metropolitan areas (Health and Community Services Committee, 2014). The Telehealth Unit was established in the Victorian Department of Health in 2013 to lead the development of a strategy that will support the uptake of telehealth within health services and by consumers (Department of Health (Vic), 2013).
Tasmania	 Videoconferencing is the main telehealth technology used, including for remote patient monitoring, multi-disciplinary case reviews, telehealth consultations, interstate specialist appointments and extensive clinical education programs (Gray, et al., 2011). The Telehealth Tasmania Network commenced operations in 1998 and enables the support and delivery of health services across the state (Gray, et al., 2011).
South Australia	 Telehealth in SA is used across a relatively limited range of specialities. However, it was an early leader in the field of telepsychiatry. More recently, telehealth services have been extended to cardiology, cancer, rehabilitation, geriatric evaluation and palliative care services (Health and Community Services Committee, 2014). Telehealth is not centrally coordinated and is managed through individual hospitals (Bywood, et al., 2013).
Australian Capital Territory	 There is limited telehealth activity in the ACT. ACT Health clinicians provide complex clinical advice to clinicians in EDs in surrounding NSW towns using telehealth (Health and Community Services Committee, 2014).

Northern Territory	 Telehealth in the NT is still in its infancy and there is limited use across the state. Telehealth NT was established in 2012 and operates in three main areas: provision of specialist care, critical care and workforce support (particularly to support remote NT regions) (Gray, et al., 2011; Department of Health (NT), 2013).
	 Telehealth continues to be an area of rapid expansion, both in terms of volume and type of services, for health care and health education. Telehealth networks are established across all jurisdictions, but their operation varies. In Ontario, Manitoba, Newfoundland and Labrador there is one telehealth program for the province (Health and Community Services Committee, 2014).
Canada	 Canada is often considered a leader in the use of video technology. Canada has developed self- sustaining, well-integrated video-conferencing services (Praxia Information Intelligence and Gartner, 2011).
	• The most commonly reported services being delivered using telehealth in 2012 were mental health (psychiatry and psychology), cardiology, diabetes, genetics, oncology, chronic pain, neurology, and rehabilitation (COACH, 2013).

4.1.6 Telehealth services can yield benefits for both receivers and providers

Telehealth-enabled models of care were consistently reported by consultation participants and in the literature to provide a range of benefits to patients, their families and carers, health care workers and the health system (as summarised in Figure 15). While there was limited literature on the benefits of telehealth usage in NSW specifically, one recent report indicated clinicians and clients in all LHDs widely support the use of telehealth in maintaining the quality and safety in health service delivery, including improving continuity of care and building clinical networks (Health and Community Services Committee,

2014). Other recent studies describe the benefits of telehealth usage across Australia, and the benefits of telehealth services more broadly are well-understood and well-evidenced (Jang-Jaccard, et al., 2014).

Get He [my son] doesn't like leaving the house and going to the hospital. It [the videoconference] avoids us having to go to the hospital. It's less stressful for both of us.

- Parent quote (2014 Evaluation of the kaleidoscopy paediatric palliative care service's tele-pad project, Dr Sharon Ryan) 🤊 🕽

Patients and their families/carers	 reduced costs and inconvenience (e.g. from less travel) less face-to-face specialists visits improved access to services (faster access and access to services that may not otherwise be available at all) improved quality of services with greater integration and continuity of care reduced burden on carers more accurate and timely diagnosis care is more patient-centred with increased independence and self-management less social isolation (e.g. from reduced travel) larger networks of care as more carers/family/friends can attend consultations
Health care workers	 ✓ greater access to continuing education and professional development ✓ greater provision of enhanced local services ✓ more experiential learning ✓ enables better networking and collaboration ✓ greater support to and reduced professional isolation for rural clinicians ✓ increased range of specialist advice available ✓ reduced time spent travelling ✓ shorter consultation times
Health system	 ✓ increased self-sufficiency of health care professionals ✓ reduced expenses related to patient transport ✓ reduced inequities in access to health services ✓ increased self-sufficiency of smaller health care facilities (such as rural hospitals and residential aged care facilities) ✓ reduced demand on emergency departments and tertiary hospitals ✓ reduced burden on subsidised transport schemes

Figure 15: Reported benefits of telehealth-enabled models of care¹⁴

Survey respondents reported the most common benefits observed for patients due to telehealth usage were improved access to both primary care services (64%, 231 respondents) and specialty care services (64%, 230 respondents) (see Appendix G in the *Appendices* companion document).

The most common benefits reported by survey respondents in relation to health care workers were access to continuing education and professional development (66%, 238 respondents), networking and collaboration (62%, 224 respondents) and greater support for rural clinicians (60%, 215 respondents)

(see Appendix G in the Appendices companion document). Likewise, the most commonly reported benefit for non-clinical staff (indicated by free text survey responses) was increased opportunities to access education and training (e.g.

What benefits have you observed for health care workers due to telehealth use: Getting specialist advice to local health staff when and where they need it. Also direct advice to at-risk clients in their home, particularly when the situation limits the client's ability to travel [sic]

- Health care worker (online survey)

due to reduced time or cost burden).

¹⁴ Sources: Nous consultations with various NSW Health stakeholders, as well as the following literature: Moffatt & Eley, 2010; Tunstall Healthcare, 2013; Health and Community Services Committee, 2014; Bywood, et al., 2013; Agency for Clinical Innovation, 2014; Medical Technology Association of Australia, 2012; Gray, et al., 2011.
There is limited evidence in published literature on the cost-effectiveness of telehealth services. Studies on cost-effectiveness generally examined specific telehealth-enabled models of care or services and provide mixed conclusions on overall cost savings. In addition, costs incurred as a result of establishing and maintaining telehealth-enabled models of care are typically not in the areas where savings are experienced (indicated by consultation participants largely related to reduced patient travel). For example, in NSW, an LHD/SHN is likely to bear the costs of implementing and sustaining a telehealth service while savings made due to reduced patient need to utilise the Isolated Patients Travel and Accommodation Assistance Scheme (IPTAAS) are experienced by EnableNSW.

4.2 Successful models of telehealth

Key lines of enquiry	Key findings		
	Good practice telehealth models (section 4.2.1)		
	 There are a range of good practice telehealth models across NSW, nationally and internationally. Seven examples from NSW and a further eight examples from across Australia (from WA, Queensland, Victoria and SA) and overseas (from Canada, New Zealand, Norway and the United Kingdom) have been explored in detail. 		
	Critical success factors (section 4.2.2)		
	 A range of factors from across all components of Nous' organisation architecture framework are required for a telehealth-enabled model of care to be successful. These relate to: 		
Where telehealth has	• leadership		
been successfully	 governance arrangements 		
embedded in models of	 the underlying clinical need and model of care 		
care, what are the	 level of integration of telehealth into business as usual 		
have contributed to this	 focus on the patient and the local context 		
success?	 planning of the model and the medico-legal, privacy, ethical and other regulatory frameworks within which the model must operate 		
	 monitoring and evaluation 		
	• funding		
	 collaboration 		
	 level of available and sustainable resources with appropriate skillsets – clinical, administrative and technical 		
	• guidelines		
	 education and training 		
	 change management 		
	 support for telehealth, including presence of clinical champions 		
	 infrastructure and technology 		
	 data collection, transmission and storage. 		

Each of these key findings is discussed in further detail in sections 4.2.1 and 4.2.2.

4.2.1 There are a range of good practice telehealth models across NSW, nationally and internationally

In NSW, nationally and internationally, a range of good practice examples demonstrate how telehealthenabled models of care can improve equity, improve access to and quality of health services, and be sustainable. These examples offer important lessons that can be leveraged to further enhance the use of telehealth where appropriate across NSW more broadly. This section details a range of good practice telehealth-enabled models of care that have been identified by the review's Steering Group, consultation participants and in the literature. The following sections detail:

- seven selected good practice models in NSW
- eight examples of good practice models across national and international jurisdictions.

Good practice clinical telehealth-enabled models of care in NSW

The review involved a detailed examination of seven good practice examples of telehealth-enabled models of care across six LHDs and one SHN, each of which has been presented as a case study in Appendix A. Each case study explores enablers of the model's success, benefits of the model and lessons learned. The information is based on a distillation of information from consultations with a range of people involved in the model including clinicians, other health workers, administrators, telehealth managers and coordinators, information and communications technology staff and LHD Chief Executives as well as from relevant documentation. A summary of the case studies is provided in Figure 16.

Figure 16: Good practice examples of telehealth-enabled models of care in NSW

Far West

Model: Medical oncology outpatient service. An oncologist from Roval Adelaide Hospital runs a telehealth clinic to Broken Hill Specialist Clinic once a month. The clinician sees patients who are on chemotherapy and those who need to be reviewed urgently (both new and follow-up patients). Patients in Broken Hill are supported by a psychologist/ counsellor, palliative care staff and/or a cancer care coordinator. Established: 2009 (pilot phase commenced)

Technology: videoconferencing

Hunter New England

Model: Outpatient services. Teams across a range of specialities provide outpatient services to patients across HNELHD and some adjacent LHDs. Some specialists run dedicated 'telehealth clinics' whilst others run a mix of telehealth and face-to-face appointments. Specialities using telehealth include surgery, respiratory, cardiology, endocrinology, gynae-oncology, neurology, mental health, cancer services, genetic counselling, and others. Established: various depending on speciality Technology: videoconferencing (Scopia) and iPads

Model: Spinal Cord Injury Chronic Pain Clinic outpatient service. Specialist spinal cord injury pain management services are provided across the state by a multidisciplinary team comprising a pain management specialist, clinical psychologist and physiotherapist. Patients are individually funded through the NSW Lifetime Care and Support Authority or WorkCover NSW insurance providers. It involves a pre-assessment via telehealth, a face-to-face clinic appointment at Greenwich Hospital and multiple follow-up consultations via telehealth over a 12 month period. Established: 2014 Technology: videoconferencing (Vidyo)

Sydney

Model: Aged care services. Geriatricians at Concord Hospital (SLHD) provide specialist geriatric services to patients located in WNSWLHD, FWLHD, and MNCLHDs. There are around 10 telehealth clinics held per month. Established: 2003

Technology: videoconferencing (CISCO)

Sydney Children's Hospital Network

Model: Paediatric diabetes clinic. Paediatric

endocrinologists from The Children's Hospital at Westmead provide specialist consultation services to children and young people with diabetes in regional areas of NSW. Services are provided by a multidisciplinary team including physicians, diabetes educators, dieticians and social work professionals. Established: 2012 Technology: videoconferencing (Lync)

Nepean Blue Mountains

Model: Hospital in the Home acute care. Nurses use iPads to provide care to patients in their own homes that would otherwise be provided in hospital. The iPads are used to contact other health professionals via videoconference for advice, take pictures of wounds, and access patient records remotely. The service is mainly used for management of wounds, anticoagulation therapy and intravenous antibiotics within the NBM LHD. Established: 2014

Technology: iPads and a purpose built app

Murrumbidgee

Model: Mental Health Emergency Consultation Service. Specialist mental health assessment and support services are available to district and community emergency departments within the LHD via videoconferencing. The service is staffed 24 hours a day, 7 days a week. Established: 2007 Technology: videoconferencing

Good practice clinical telehealth-enabled models of care in other national and international jurisdictions

Eight examples of good practice telehealth-enabled models of care from within Australia (but outside NSW) and overseas were selected for detailed review based on the literature and models cited by consultation participants. These examples were selected as they were consistently identified in the literature and by consultation participants as successful telehealth-enabled models of care. A summary of these good practice models is provided in Figure 17 and more detail is provided in Appendix I (in the *Appendices* companion document).

Figure 17: Good practice examples of telehealth-enabled models of care nationally and internationally

Western Australia

Emergency Telehealth Service

- Uses videoconferencing to link emergency specialists to small hospital emergency departments
- Reported benefits include empowerment of local clinicians, and the provision of life saving care to rural and remote areas
- In 2015, 40 of 66 regional sites were connected

Queensland

Townsville Cancer Centre teleoncology service

- Uses videoconferencing to manage medical oncology patients in rural and remote QLD (from first consultation through to treatment and followup)
- Over 1000 consultations conducted with 200 patients since the service launched
- Key enablers included training staff about the technology, upskilling rural generalist clinicians, having a telehealth coordinator, increasing the number of staff at the provider end, and availability of CTs and pathology in Mt Isa



Ambulances are fitted with equipment to transmit ECG images to hospitals to be analysed by

- cardiologists who make a rapid diagnosis and management recommendations
- The service targets patients with suspected heart attack
- Available in over 100 ambulances
- Demonstrated better patient outcomes and improved collaboration between health professionals

United4Health (Scottish Centre for Telehealth and Telecare)

- Home-based monitoring devices are used to monitor patients living with diabetes, chronic obstructive pulmonary disorder, or heart failure in their homes.
- Enables early detection of worsening conditions and supports increased self-management, early treatment, and decreased hospitalisations
- Expected to provide care to 7,700 patients across Scotland in the three year trial period from 2013

South Australia

Rural and Remote Mental Health Service

- Uses videoconferencing to provide specialist mental health services to rural and remote parts of SA
- Patients can access initial assessments, discharge planning, and ongoing treatment
- Over 100 videoconferencing units are installed across 80 sites
- Around 1800-2000 consultations conducted (in 2009)
- Reportedly embedded into clinical practice

Victoria

Victorian Stroke Telemedicine Program

- Virtual system links rural doctors to Melbourne-based neurologists who provide treatment advice about patients with stroke symptoms
- Neurologists use real-time access to patient data, audio-visual communication, and brain imaging to facilitate remote consultations
- 42 patients treated in 2014 pilot phase

4.2.2 A range of factors are required to support successful telehealth models

A range of factors across the components of the organisation architecture framework are required to be in place for a telehealth-enabled model of care to be successful. Table 5 outlines these factors at the level of the individual model of care. These have been informed by critical success factors identified in the literature, as well as key success factors identified in NSW, other national and international telehealth-enabled models of care (discussed in section 4.2.1). The most commonly cited success factors are indicated in bold in Table 5 and discussed in more detail below.

Governance • Telehealth-enabled models of care are guided and supported by strong leadership • Telehealth-enabled models of care have clear governance arrangements that are embedded and understood. Telehealth-enabled models of care are: **Purpose/Strategy** • Driven by one or more specific clinical needs and therefore has a clearly defined purpose and is clinically relevant • Applied to an existing model of care where it is well defined or to a new model of care • Underpinned by a robust clinical care model • Integrated into business-as-usual. Patient and locally focused • Telehealth-enabled models of care are patient centred, focusing on the clinical care of patients rather than the technological aspects of the model • Local relevance (i.e. there is consideration of local issues, needs and existing resources) • Telehealth is accessible to the community and patients are supported to use telehealth Planning • Implementation of the model is based on robust planning, which involves key stakeholders, the organisational partners and the local community from the beginning • Medico-legal, privacy, ethical and other regulatory frameworks are assessed to determine Service and value whether they pose critical barriers to the delivery of telehealth services and relevant issues are delivery addressed Monitoring • Models are monitored and evaluated on an ongoing basis to support continuous improvement • Funding and resourcing • A sustainable funding model underpins the service • Funding arrangements do not act as disincentives to the use of telehealth • There is adequate planning and upfront discussion about resourcing required at the central LHD or SHN level and the model of care level to ensure the service is sustainable (e.g. fully exploring all associated costs and how these costs will be funded) • Models are flexible to allow them to adapt to changing clinical needs • Consideration is given to redesigning a model of care to integrate a telehealth solution • An iterative process is used to design a model of care.

Table 5: Critical success factors, at the model level, for effective telehealth-enabled models of care¹⁵

¹⁵ Sources: Nous case study consultations with selected LHDs and SHNs; Nous online survey; and the following literature - (Agency for Clinical Innovation, 2014b) (Australasian Telehealth Society, 2013) (Blount, 2015) (Bywood, et al., 2013) (Gray, et al., 2011) (Hailey & Crowe, 2003) (NSW Ministry of Health, 2013) (Praxia Information Intelligence and Gartner, 2011) (Queensland Health, 2008) (Taylor, 2013) (Watons, et al., 2001) (World Health Organization, 2010)

External alliances and partnerships	 There is consultation and collaboration with local government and non-government agencies There is strong cooperation between organisations involved in telehealth services There is a shared commitment to and understanding of the telehealth-enabled model of care by all involved parties. 		
Business processes	• Adequate clinician reimbursement is available for telehealth services		
¢°	 There are resources dedicated to ensuring effective coordination Standard guidelines and manuals that clarify business rules and procedures and are developed and implemented to ensure consistency and ongoing operation even with changes of personnel. 		
Workforce	• The model is supported by a sustainable workforce		
	 Staff receive adequate education and training in the new technology and model of care There is adequate administrative support 		
	 Ongoing technical support is readily available. 		
Culture	 Effective change management (including a communications plan) supports the introduction of telehealth Support for telehealth Stakeholders perceive a need for telehealth Staff view telehealth as improving current care arrangements Clinicians at both the provider and receiver ends of telehealth-enabled models, as well as other 		
Physical assets	 Stakeholders, buy-in to the model. There is adequate physical infrastructure in place to meet minimum requirements Technology is: reliable easy to use convenient and easily accessible 		
_	 Technology aligns with the clinical service needs 		
	• Technology is compatible across jurisdictions (including LHDs) to enable interoperability.		
Organisation structure	 There is central service management and coordination. 		
Roles and accountabilities	 Dedicated and appropriately skilled telehealth coordinators are in place (typically at the LHD and SHN level who can be called up to provide support for individual models) Clinical champions are located at each site. 		
Information management	 Appropriate data collection mechanisms that enable measurement of costs and clinical benefits are in place Data is able to be transmitted and stored securely. 		

The ACI Telehealth Guidelines contain information about the use of telehealth for clinical and nonclinical purposes, including clinical, implementation, financial and technical considerations. This information could be built on to more explicitly to outline the elements of best practice models of telehealth-enabled care and specify those factors that are essential to supporting a successful model.

Successful telehealth-enabled models of care are driven by a specific clinical need

A common element of successful telehealth-enabled models of care is that they were developed to

address a particular clinical need rather than arising out of the adoption of telehealth technology into an existing model of care 'just because' the technology was available. This ensured the models are both clinically relevant and have

Telehealth should not be used 'just because', but rather targeted to solve a specific clinical problem or issue. - Stakeholder consultation ??

models are both clinically relevant and have a clearly defined purpose (i.e. are fit-for-purpose).

The literature, supported by the views of consultation participants (particularly those from the case study sites), identified that successful telehealth-enabled models of care had involved the completion of a needs assessment and analysis early in the conceptual phase of the model. Once a clinical need was identified and the specifics of the need defined, stakeholders then assessed whether telehealth was the most appropriate way to meet the need. If so, a model of care was then designed that incorporated a technological solution suit to the specific purpose. Consultation participants cited the importance of clearly articulating from the outset how the use of telehealth contributes to the overall vision and purpose of the organisation or health system (i.e. to provide high-quality, patient-centred care).

The identification of a specific clinical need also encourages the early engagement and involvement of clinicians in the planning and design process. Consultation participants reported early clinician engagement often resulted in strong buy-in with higher rates of acceptance, uptake of and ongoing support for telehealth-enabled models of care.

All models of care examined as part of the development of the good practice case studies in NSW (presented in Appendix A) involved telehealth services that were developed based on a specific, identified clinical need. For example, in conjunction with the Lifetime Care and Support Authority, staff in NSLHD identified the need for pain management services provided using telehealth for patients with spinal cord injury and chronic pain (due to their reduced mobility and often complex needs). Once this clinical need was identified, the use of telehealth to address the clinical problem was explored and confirmed as an effective way of addressing the issue.

In SLHD, clinicians recognised the lack of geriatric services in rural and remote parts of Western NSW presented a clinical problem and identified the provision of specialist geriatric services via videoconferencing as an appropriate way of solving this problem.

Successful telehealth-enabled models of care take into account the local context

Consultation participants, supported by the literature, reported that successful telehealth-enabled models of care were designed based on a consideration of the issues faced by and needs of the local community as well as available resources (including staff and equipment). A sound understanding of the context into which telehealth services are delivered is essential to ensuring the services provided are

appropriate, safe, adequately supported, continue to be utilised and are sustainable. It also ensures suitable follow up care is available to the patients and supports the



Specialists who are providing the telehealth consultations must understand the local clinical capacity and skills and take these into account when consulting and making recommendations

- Chief Executive, Rural LHD (stakeholder consultation)

engagement of local clinicians with the model.

Robust planning involving all relevant stakeholders underpins successful telehealth-enabled models of care

Telehealth-enabled models of care that are underpinned by thorough planning and extensive consultation with all relevant stakeholders were more likely to be suited to clinical needs, relevant to the local context and to have higher integration into business as usual, according to consultation participants.¹⁶ This is supported by the literature which describes the need for robust planning, including articulating what the telehealth service is aiming to achieve, establishing the parameters, scope and timelines, and identifying any risks.

Consultation with relevant stakeholders, including clinicians at both the provider and receiver end, technical staff, administrative staff, organisational partners and the local community, throughout the design, planning and implementation phases of a telehealth-enabled model of care was cited as a key success factor by consultation participants from all case study locations. Early involvement in these processes creates a sense of ownership of the model, supporting buy-in to and uptake of the model.

Using the consultation process to educate key stakeholders about the existence of the service and its intended benefits was also cited in the literature as crucial to maximising usage.

Two way consultative processes [were used in designing the model]. Technical people consulting with clinical, technical people visited the patients at home with nurses. There was a lot of consultation which was very helpful. It was a multi-step process to roll-out. [sic]

- (Stakeholder consultation) 🏓

Adequate clinician reimbursement for participating in telehealth consultations is critical

Availability of adequate reimbursement for clinicians who participate in telehealth-enabled models of care (at the provider and receiver ends) is critical to support the uptake and sustained use of these models. This was consistently cited by consultation participants across the NSW health system as well as in the literature.

Addressing the financial disincentives that result from the existing MBS billing and ABF arrangements was consistently reported by consultation participants as a way to support adequate clinician reimbursement. A smaller number of consultation participants indicated financial incentives have been used to provide compensation to clinicians and could be further expanded (e.g. the Commonwealth Government's Telehealth Financial Incentives Program which ceased on 30 June 2014, the provision of

purpose-specific grants to establish models, and Queensland Health's provision of an admitted patient telehealth event payment to the providerend of admitted patient telehealth services).

 There was no incentive for specialists to provide [telehealth] services to rural or remote areas...
 Now, there are provider incentive payments. This is not sustainable... but it has worked to provide the incentive to get clinicians using telehealth.
 Telehealth manager(stakeholder consultation)

¹⁶ For example, NBMLHD cited the critical importance of its early consultation and partnership with the University of Sydney in developing its Outreach app for use in their *Hospital in the Home Program*. This planning and partnership enabled the LHD to access vital technical expertise they could not otherwise easily obtain.

Successful telehealth-enabled models of care were underpinned by adequate administrative support

Consultation participants and the literature reported telehealth-enabled models of care require additional administrative support to provide effective and efficient coordination at both ends of a telehealth consultation. Adequate administrative support, particularly in relation to preparatory work prior to telehealth consultations, was considered essential for the smooth operation of the consultations on the day.

Consultation participants provided examples of the additional administrative work created by the use of telehealth for the provision of consultations, including: identifying referrals suitable for telehealth consultations; scheduling telehealth facilities and equipment; booking clinicians; collating, faxing, and emailing preparatory paperwork such as patient records and investigation results; liaising with patients; and supporting the clinician on the day.

Adequate administrative support ensures smooth organisation and coordination, particularly on the day of telehealth consultations. This in turn supports increased clinician buy-in and acceptance of telehealth as it avoids creating additional work for the clinicians.

Successful telehealth services are supported by strong change management

Effective change management was identified by consultation participants as critical to enabling telehealth-enabled models of care to operate as business as usual. They reported that, to be effective, telehealth-enabled models of care require the support and engagement of key stakeholders throughout their lifecycle, from design through to implementation and evaluation. Strong change management helps to maximise stakeholder acceptance of and buy-in to new technologies and processes. This is clearly illustrated in Queensland where there has been wide and increasing uptake of telehealth-enabled models care, partly because of dedicated change management resources (Gray, et al., 2011).

The need for strong change management was clearly articulated in the literature, which also consistently stated the change management process should acknowledge the capacities and perceptions of people involved with the model and actively engage them in the process of change. Consultation participants reported that appropriate training (about the model of care and how to use the technology), and the provision of adequate information for both staff and patients as components of an effective change management approach supported increased uptake of telehealth.

Adequate physical infrastructure underpinned successful telehealth-enabled models of care

The literature and consultation participants consistently cited the importance of the provision of adequate physical infrastructure in successful models of telehealth-enabled care, particularly the provision of appropriate facilities in which to conduct telehealth consultations. Such facilities comprise consultation rooms or offices that are: soundproof to ensure privacy and minimal noise interference; equipped with the required telehealth technology; large enough to, where required, allow for patient examination and/or provide adequate room for family members and carers to participate; and are readily available for booking.

Reliable, user-friendly and convenient technology is critical to ensuring successful telehealthenabled models of care

Consultation participants (particularly those in case study locations) and the literature consistently reported that successful models are underpinned by telehealth technology that is reliable, and easy, quick and convenient to use. Earlier on, there was a focus on getting the foundational technology and infrastructure in place to enable telehealth to work.... This was critical as a good user experience with telehealth makes it more likely clinicians will use it again (while a poor experience means clinicians are much less likely to use it again)

- Telehealth manager (stakeholder consultation) $\overline{77}$

As discussed in detail under enablers in section 4.3.1, these characteristics support greater clinician buyin and acceptance of telehealth, thereby encouraging the uptake and sustainability of these services.

Dedicated and appropriately skilled telehealth coordination role/s provide essential clinical and technical support, and support for the implementation and ongoing use of telehealth

The resourcing of dedicated telehealth role/s in LHDs and SHNs was identified by the majority of consultation participants from across the health system as critically important to supporting the uptake and ongoing success of telehealth-enabled models of cares. This was supported by the literature in which the provision of a single point-of-contact to coordinate and drive the uptake of telehealth services was consistently cited as a characteristic of successful models of care.

While the role titles, functions and nature of the skill set of the dedicated roles currently in existence across the LHDs and SHNs differed slightly, there was consensus among consultation participants and the literature that the people in these roles must have the right basic skill mix (covering technical and clinical skills) and adequate decision-making authority. The telehealth coordination role/s should be the communication channel between the technical IT staff and the clinical staff.

The key functions of effective dedicated telehealth roles, whether a telehealth coordinator, telehealth manager or other role title, include:

- providing oversight of and driving the strategic direction for telehealth across the LHD and SHN
- identifying and addressing barriers to the uptake of telehealth
- encouraging the uptake and ongoing use of telehealth where it provides an appropriate solution to a clinical problem, including through an effective change management approach
- ensuring coordination and collaboration between the strategic, technical and clinical elements of telehealth within the LHD and SHN
- supporting staff who wish to explore the potential of new telehealth-enabled models of care
- supporting the design, planning and establishment of telehealth-enabled models of care (e.g. technology and billing requirements)
- supporting the day-to-day operations of telehealth-enabled models of care
- providing support to the users of the model, including clinicians, administrative staff and patients
- supporting the evaluation and continuous improvement of telehealth services
- collaborating with staff in similar roles in other LHDs and SHNs to share learnings and innovative ideas.

The role must be empowered to manage and sustain telehealth initiatives, be able to direct internal

resourcing, have both the appropriate clinical and technical skills and/or experience, have a commitment to and be a champion for telehealth, and have executive visibility to promote key milestones.

If there is somebody who is a 'go to' person, it can enable the use of telehealth, particularly if they are more than the 'technology person', but can provide change management, support to users [sic] - Telehealth manager (stakeholder consultation) Telehealth services in all seven good practice example case study sites in NSW are supported by a dedicated telehealth coordinator or manager. In the case of HNELHD, telehealth services are supported by an entire dedicated telehealth team comprising six people with a mix of technical and clinical backgrounds. HNELHD consultation participants consistently cited the existence of this team as one of the most critical factors that has supported the successful expansion of telehealth across the LHD. In addition, Queensland Health has recognised the value of this role by now funding 23 permanent telehealth coordinators to support local buy-in and drive telehealth uptake in all Hospital and Health Services¹⁷.

Clinical champions are essential to drive the uptake and implementation of telehealth-enabled models of care

The majority of consultation participants in NSW, Queensland, WA and Victoria emphasised the key role that strong clinical champions play in supporting telehealth-enabled models of care to be successful. Strong clinical champions take ownership, drive uptake and support the ongoing use of telehealth.

Consultation participants highlighted the role of clinical champions at both the provider and receiver ends of the telehealth in greatly improving the likelihood of the telehealth-enabled service being tried, adopted and used over the longer term. This was supported by the literature which cited effective clinical champions as critical in providing leadership, assisting with the integration of telehealth into existing clinical services and ensuring sustainability.

Successful telehealth-enabled models of care identified and supported clinical champions from the outset to ensure they had ownership of the model, were an integral part of the decision making process and felt empowered. This meant clinical champions were more likely to be passionate supporters of the model and to encourage other clinicians to adopt it.

For example, in recognition of this key role played by clinical champions, Queensland Health identified and targeted specialist doctors interested in using telehealth, and provided them with funding to enable them to establish, grow and research telehealth-enabled models of care. Many of these specialists continue to be strong champions for telehealth, have developed robust models, have contributed to the evidence base for using telehealth and retain strong relationships with Queensland Health.

Key lines of enquiry	Key findings
What are the key enablers and barriers to uptake and effective use of telehealth?	 Key enablers (section 4.3.1) A range of key factors across most elements of the organisation architecture framework (excluding roles and responsibilities) enable the uptake of telehealth in NSW. The most commonly cited enablers of telehealth uptake at an LHD/SHN level included:
What state-wide settings are required to optimise and sustain the use of telehealth in NSW?	 a strong clinical driver for the use of telehealth where the technology provides the technical solution to a specific clinical problem provision of adequate administrative support for smooth organisation of telehealth consultations

4.3 Enablers of and barriers to uptake of telehealth in NSW

¹⁷ The devolved structure of the health system in Queensland is similar to that in NSW - Queensland has a central department of health (QLD Health) with 16 Hospital and Health Services while NSW has a central department of health (NSW Ministry of Health) and 18 LHDs and SHNs.

Key lines of enquiry	Key findings	
	 strong change management to support uptake of telehealth 	
	 technology that is easy to use, convenient, quick to access, reliable, fit- for-purpose and cost-effective 	
	• an effective telehealth coordination role that incorporates both technical and clinical knowledge, and both acts as the single point of contact for all telehealth related questions and provides support.	
	Key barriers (section 1.1.1)	
	 A range of key factors across most elements of the organisation architecture framework (excluding organisation structure) hinder the uptake of telehealth in NSW. The most commonly cited barriers of telehealth uptake at an LHD/SHN level included: 	
	 the need for strong and clear central governance to provide strategic direction and guidance 	
	 financial disincentives created by the MBS discourage clinicians from using telehealth in situations where it is appropriate and would provide considerable benefits 	
	 uncertainty about the impact of ABF on funding for services provided using telehealth 	
	 the need for access to adequate and appropriate technology, including bandwidth, to support quality and reliable communication 	
	 the need for systems to support effective scheduling of telehealth consultations, including a global contact list. 	
	State-wide settings (section 4.3.3)	
	 A range of state-wide settings are required to optimise and sustain telehealth use across NSW. These are: 	
	 a central governance body for telehealth that has a strategic role 	
	 a clearly articulated vision and strategic direction for telehealth in NSW 	
	 an agreed definition of telehealth 	
	 an effective approach to change management 	
	 ABF arrangements that recognise telehealth activity at both the receiver and provider ends 	
	 funding and a strategic approach to support the establishment of new innovative telehealth-enabled models of care 	
	 state-wide provision of the basic technology infrastructure required to enable the use of telehealth 	
	 state-wide policy statements that clarify telehealth-related issues 	
	 the inclusion of KPIs in service agreements with all LHDs/SHNs 	
	 data capture mechanisms that enable collection and analysis of telehealth data across NSW 	
	• the provision of core telehealth training for relevant NSW Health staff.	

4.3.1 Key enablers to uptake of telehealth related primarily to purpose, business processes, culture, physical assets and organisational structure

A range of factors across most elements of the organisation architecture framework have enabled the uptake of telehealth services across NSW to date. These enabling factors refer to the uptake of telehealth services at an LHD/SHN level (as opposed to the critical success factors outlined in section 4.2.2, which relate to telehealth at the model of care level). These enabling factors are outlined in Table 6 and have been distilled from survey responses and stakeholder consultations, as well as the literature. The most common enablers cited by consultation participants and in the literature as being critical to the uptake of telehealth services in NSW related to purpose, business processes, culture, physical assets and organisation structure. They are indicated in bold in Table 6 and discussed in more detail below.

Governance	 Strong leadership, including support from senior management and LHD and SHN Chief Executives Clear governance arrangements and arrangements for strategy, policy, funding, infrastructure, and clinical responsibility are in place and understood Flexibility in governance at a service level Strategic approach to identifying innovative approaches to using telehealth and the uptake of new technologies.
Purpose/Strategy	 Clear strategic planning for telehealth that is based on clinical need and undertaken across the LHD/SHN to guide implementation and ensure consistency in telehealth usage across the LHD/SHN.
Service and value delivery	 Introduction of telehealth as a part of business-as-usual activities rather than as a separate pilot or special project Inclusion of clinical mandates to use telehealth at the level of the: LHD through the LHD service level agreement with the MOH clinician through the incorporation of telehealth-related performance indicators in clinician contracts (e.g. in one LHD, the inclusion of clauses in clinician contracts requiring them to spend at least a particular percentage of their time involved in telehealth consultations).
External alliances and partnerships	 Effective alliances and partnerships to support best practice models, including with Primary Health Networks (formerly Medicare Locals), GPs, providers of private specialist services, other local health providers, NGOs and organisations that can provide particular expertise (e.g. universities).
Business processes	 Effective planning to ensure telehealth-enabled models of care are supported by adequate administrative support Provision of adequate education of and support for users of telehealth An effective communication strategy to ensure staff know where to find information about existing telehealth services or how to develop new telehealth-enabled models of care.
Workforce	 Capability to rapidly resolve any telehealth related issues that arise.

Table 6: Enablers of uptake of telehealth in NSW at an LHD and SHN level

Culture	 Strong change management to support uptake of telehealth Early engagement of clinicians in designing a telehealth-enabled model of care to ensure buy-in and ownership of the model Community awareness of telehealth services and the benefits of these services.
Physical assets	 Technology that is: easy to use convenient quick to access reliable fit-for-purpose cost-effective.
Organisation structure	 An effective telehealth coordination role that incorporates both technical and clinical knowledge and both acts as the single point of contact for all telehealth related questions and provides support Technical, clinical, and strategic support roles for telehealth that each have clearly defined functions and skill sets, but work in close partnership with one another.
Roles and accountabilities	No significant role and responsibility enablers were identified.
Information management	 Provision of evidence to support the benefits of telehealth, particularly with respect to improved patient outcomes Scheduling of telehealth-specific clinics rather than including telehealth consultations amongst face-to-face consultations in a clinic.

Effective change management is a key enabler of the uptake of telehealth

Consultation participants cited the importance of change management being prioritised and supported at the LHD and SHN level to encourage the uptake of telehealth. They reported that for telehealth services to be accepted into business as usual, change management that originates at the LHD or SHN Chief Executive level and filters down is critical. The understanding of management at all levels of the importance of managing change when implementing telehealth services is essential to support and encourage usage by clinical and non-clinical staff across the health system.

A specific telehealth strategy at an LHD or SHN level was also reported by consultation participants to be useful in guiding change management processes. HNELHD has developed a stand-alone telehealth-specific strategy to guide implementation of clinical telehealth initiatives across the district. The strategy acknowledges inadequate change management support as a key adoption barrier to telehealth and outlines how HNELHD intends to address it (Hunter New England Area Health Service, 2010).

Consultation participants identified that some jurisdictions, including HNELHD and Queensland, are currently exploring the value of including telehealth related KPIs in contracts with individual clinicians to encourage their uptake of telehealth as one aspect of their change management approach. Part of this exploration includes identifying how best to encourage uptake of telehealth into models of care where clinically appropriate rather than simply to meet a KPI. Inclusion of such KPIs will also require adequate reporting capabilities to enable monitoring of performance against the KPIs.

Effective planning is necessary to ensure telehealth-enabled services are supported by adequate administrative support

LHDs/SHNs with successful telehealth-enabled models of care anticipated, recognised and adequately resourced (both in terms of funding and personnel) for the administrative requirements associated with the use of telehealth. Consultation participants frequently reported that telehealth consultations create a greater administrative burden than face-to-face consultations. Planning for this extra workload and providing adequate resources to undertake it (particularly in the establishment phase of a telehealth service) were identified by consultation participants and in the literature as essential to the success of telehealth services.

Consultation participants identified that planning for and the provision of adequate resources for the following administrative tasks was essential:

- identification of patients who may be appropriate to be seen via telehealth
- effective booking and scheduling of telehealth consultations (including booking facilities and technology, and liaising with the patients and clinicians at local sites) this requires an effective scheduling ICT system
- ensuring all required patient information, including medical records and investigation results, is available to the provider of the telehealth consultation prior to the consultation
- setting up the telehealth equipment (e.g. videoconferencing equipment) on the day of the telehealth consultation to save clinicians time and ensure the technology is working.

An effective telehealth coordination role is a critical enabler of telehealth uptake

An effective telehealth coordination role was raised as both an enabler of and critical factor for the success of telehealth-enabled models of care by consultation participants and in the literature. It is discussed in detail in section 4.2.2 in terms of its importance at a model of care level.

Consultation participants also cited the importance of an effective telehealth coordination role at an LHD or SHN level to maximise the uptake of telehealth.

In NSW and other national jurisdictions, telehealth coordination roles were typically located at an LHD or SHN level. They were reported by consultation participants to play a critical role in encouraging and supporting the uptake of telehealth across districts and networks, rather than just in specific specialities or models of care. Consultation participants emphasised the importance of a single point of contact for all telehealth related matters that could provide advice on how to design and implement services, how to encourage the use of telehealth services and how to ensure sustainability. Telehealth coordination roles were also identified as critical in ensuring adequate change management processes are in place at the LHD/SHN level to support acceptance and uptake of telehealth amongst clinicians, other health care workers and administrative staff.

Reliable, user-friendly technology that is fit-for-purpose supports clinician and patient buy-in

Technology that is reliable, quick, easy and convenient to use and suited to the intended purpose was consistently identified by consultation participants as a key enabler of successful telehealth services at an LHD/SHN level.

Reliable technology was reported to support clinician buy-in and encourage health care workers to both initially try and continue to use telehealth technology. Consultation participants at all case study sites agreed the provision of adequate technological infrastructure, including hardware, software and bandwidth, is critical in ensuring telehealth-enabled models of care can function reliably. This was further evidenced in national and international case studies of successful telehealth services which identified the need for adequate and reliable technological infrastructure to be in place.

Similarly, user-friendly technology was also reported as necessary to gain clinician buy-in and encourage the uptake and ongoing use of telehealth. Consultation participants and the literature identified the

need for technology to be simple (e.g. 'one button start') and flexible (e.g. mobile) so as to support clinicians to work efficiently and effectively rather than be faced with an increased time burden and greater workload pressures.

This way the clinician can walk in and do the evaluation of the patient, and [the technology] just works. It's about taking out the nuances and frustrations that allow the clinicians to say 'it's all to hard' and chose not to use it again [sic] - LHD Chief Executive (consultation)

Technology that is quick and easy to access is particularly important in the provision of time-critical care (e.g. telestroke services, critical care services delivered into remote EDs) to also ensure patient care is not compromised.

Given that telehealth technology relies on the internet to operate, the importance of the central provision of minimum technology infrastructure requirements (including adequate bandwidth) to support reliable, quality connections to enable minimal disruptions was strongly reinforced during consultations and in the literature. This was particularly noted in relation to patients and clinicians located in rural areas who use videoconferencing to participate in telehealth consultations. The standard for audio-visual connections must be high enough to support clinical consultations done via videoconferencing.

A common theme arising in the consultations with case study sites was the importance of ensuring the telehealth technology is designed to suit the specific clinical need to be addressed (e.g. the NBMLHD *Hospital in the Home* app was purpose-built). This requires the early and close involvement of the clinicians who will use the telehealth-enabled service in the design of the model of care and may necessitate an iterative approach to the design.

Telehealth technology must provide a financially viable option to resolving a clinical problem in order to potentially be sustainable. Consultation participants indicated the cost-effectiveness of technology may be improved by, where appropriate, supporting the use of the technology for multiple purposes rather than just for the original purpose (e.g. the implementation of videoconferencing systems to support one particular model of care may be suitable for use in multiple models of care and/or for non-clinical purposes).

Consultation participants also cited the importance of staff receiving adequate training in how to use the technology to ensure they are comfortable with its main functions and can do basic troubleshooting. A top theme from free text survey responses indicated 16% of respondents (36 respondents) felt training and education for staff on how to use new systems and technologies is a key enabler of the uptake of telehealth services.

4.3.2 Key barriers to uptake of telehealth related primarily to governance arrangements, service and value delivery, and physical assets

An array of factors was identified as hindering the uptake of telehealth across NSW. These barriers refer to the uptake of telehealth services at an LHD and SHN level (as opposed to the critical success factors outlined in section 4.2.2, which relate to telehealth at the model of care level). These factors are outlined in Table 7 according to the organisation architecture framework and were distilled from survey responses, stakeholder consultations and the literature. The most commonly cited barriers to uptake of telehealth in NSW related to governance, service and value delivery, physical assets and information management. These barriers are indicated in bold in Table 7 and discussed in more detail below.

Governance	• Need for strong and clear central governance to provide strategic direction and guidance	
Purpose/Strategy	 Need for a clear strategic direction to drive telehealth in NSW 	
Service and value delivery	 Financial disincentives created by the MBS, particularly in relation to: clinicians providing services to patients who live within metropolitan areas consultations provided by GPs and nurse practitioners clinicians providing consultation as part of a multi-disciplinary team clinicians consulting with each other about a patient when the patient is not present Patients and clinical services that are not suited to the use of telehealth technology (e.g. patient who are very deaf or paranoid, clinical specialties that require detailed examinations of patients) Uncertainty about the impact of ABF on funding for telehealth provided services – occasions of service that are related to telehealth need to be better identified and greater clarity needs to be provided about who receives funding through ABF for telehealth consultations (i.e. the provider or receiver of the consultation) Need for mechanisms to ensure appropriate handover of clinical information to local clinicians in instances of clinician to patient consultations (i.e. where no clinician is present at the patient end) to ensure appropriate follow up care is provided 	
External alliances and partnerships	 Models that rely on a partnership with a particular individual clinician rather than a partnership with health services risk the model being unsustainable if the individual clinician decides to no longer participate in the model 	
Business processes	 Telehealth is not embedded into the workflow of clinicians Non-standardised language around telehealth which causes confusion and complication Need for standardisation of processes across the LHDs and SHNs Perceived medico-legal, ethical, confidentiality and/or security issues (which, in reality, do not appear to be significant issues) Need for greater clarity about who owns the patient record resulting from a consultation undertaken using telehealth 	
Workforce	 Need for adequate clinical expertise locally at the receiving end of consultations to ensure patients can access appropriate follow up care locally 	
Culture	 Poor change management at the LHD and SHN level Cultural issues among health staff – some health staff are resistant to using telehealth as they view it as a complication and additional work (particularly those in metropolitan areas) rather than a technology enabled solution to clinical problems Community attitude to telehealth – health system managers perceived consumers are not aware of telehealth services available and/or view telehealth as a second rate service 	

Table 7: Barriers to the uptake of telehealth in NSW at an LHD and SHN level

Physical assets	 Need for access to adequate and appropriate technology, including adequate bandwidth, to support quality and reliable communication Need for standardisation of infrastructure across the LHDs and SHNs to enable interoperability of systems Full range of technology options available are not being leveraged Inadequate or inappropriate facilities in which to undertake telehealth consultations Need for models to be agile so they can incorporate new technologies as they evolve
Organisation structure	No significant organisation structure barriers have been identified to date
Roles and accountabilities	 Need for clarity about the roles and responsibilities of the central health agencies involved in telehealth
Information management	 Need for systems to support effective scheduling of telehealth consultations, including a global contact list Need for the use of an eMR consistently across the state – eMRs will facilitate the use of telehealth Need for sufficient data capture to enable an analysis of telehealth usage and its benefits, including the need for an identifier for telehealth consultations

The need for strong and clear central governance of telehealth services was raised almost universally by stakeholders

The lack of a strong central mechanism to drive telehealth uptake in NSW was cited both in the literature and by consultation participants as a key barrier to the use and expansion of telehealth services. This has resulted in limited overarching leadership of telehealth in NSW, no apparent unified approach to implementation, and limited accountability for progress in the uptake and expansion of telehealth services.

Consultation participants almost universally agreed that a single governance mechanism that utilises existing governance arrangements is needed to set direction for telehealth NSW, drive its uptake at a

strategic level and provide overarching guidance for state-wide implementation of telehealth services by LHDs and SHNs. At the same time, the vast majority of

There needs to be one body that is accountable for telehealth, driving its uptake across the state, ensuring its use fit with the relevant strategic plans and can be supported by the infrastructure... monitoring its use, sharing learnings and identifying successes [sic] - Stakeholder consultation

consultation participants also agreed that LHDs and SHNs should retain responsibility for implementing telehealth and have the flexibility to implement telehealth to suit local requirements.

The governance arrangements for telehealth at a state level need to align with other relevant existing governance arrangements, policies, strategies, and frameworks. Appendix K (in the *Appendices* companion document) provides an overview of the main documents relevant to the management and delivery of telehealth services in NSW, including state and national documents such as the *NSW State Health Plan: Towards 2021*, NSW Rural Health Plan, *A Blueprint for eHealth in NSW, National eHealth Strategy* and *Towards a National Strategy for Telehealth in Australia 2013-2018*.

Existing MBS billing arrangements are a major disincentive to the adoption of telehealth into models of care

While Medicare has provided rebates for telehealth consultations since 1 July 2013, consultation participants consistently reported the current MBS billing arrangements create a significant financial disincentive for clinicians to use telehealth in situations where it is appropriate and would provide considerable benefits (particularly to patients, their families and carers). In many circumstances, there is currently no other feasible way for clinicians to be reimbursed for telehealth consultations when they are unable to bill through Medicare.

Medicare rebates are available for telehealth consultations provided by specialists, consultant physicians and consultant psychiatrists to eligible patients (eligibility criteria are outlined in Figure 18) (Department of Health (Commonwealth), 2013). For the purposes of the MBS, telehealth relates specifically to video consultations between a patient (who may or may not have a health professional with them) and a specialist doctor in a different location in which the patient and specialist can see and hear each other (Department of Health (Commonwealth), n.d.). The schedule fee for a telehealth video consultation is based on two MBS items: the existing specialist item and a telehealth item which derives its schedule fee as an additional 50% on top of the schedule fee for the service provided face-to-face.

Figure 18: Current eligibility criteria for a telehealth consultation to be billed to Medicare (Department of Health (Commonwealth), 2013)

A patient must:

- not be an admitted patient
- not be a patient of an ED
- be located in a telehealth eligible area (i.e. reside in an area outside of RA1 Major Cities as per the ASGCRA classifications)*
- be located at least 15km by direct road from the specialist at the time of the consultation*
- be living in eligible residential aged care facilities or who are at an eligible AMS/Aboriginal Community Controlled Health Service
- be eligible for Medicare rebates.

*except for patients living in eligible residential aged care facilities or who are at an eligible AMS/Aboriginal Community Controlled Health Service Specific MBS billing issues identified by consultation participants relate to the:

- inability of clinicians to bill through Medicare for telehealth consultations conducted with
 patients who live within metropolitan (RA1 classified) areas. This is particularly problematic for
 patients who have difficulty accessing health services (e.g. people with a disability) or who live
 within a metropolitan area but for whom it would take substantial time to travel to and from a
 face-to-face appointment. Given almost 75% of the NSW population live in a metropolitan
 region, this is a significant barrier to the expansion of telehealth services in NSW (Australian
 Bureau of Statistics, 2013).
- inability of GPs to bill through Medicare for patient consultations conducted using telehealth
- inability of nurse practitioners to bill through Medicare for patient consultations conducted using telehealth
- inability of more than one clinician involved in a consultation as part of a multidisciplinary team to bill for telehealth consultations. Consultation participants reported these arrangements make it unsustainable for multidisciplinary teams to provide care via telehealth (i.e. they do not cover the cost of input by multidisciplinary teams).
- inability of clinicians who use telehealth to consult with each other about a patient when a patient is not present to bill for these consultations (e.g. consultations between a GP and a specialist or consultations between a specialist and a sub-specialist).

Survey results supported the views of consultation participants with almost 60% of survey respondents (204 respondents) agreeing or strongly agreeing funding issues (including Medicare reimbursements) were a significant barrier to the uptake of telehealth in their workplace (see Figure 19).

Figure 19: Extent to which respondents agreed that funding issues were a significant barrier to the uptake of telehealth in their workplace (n=419)



Consultation participants in Queensland, Victoria, and WA also identified current MBS arrangements as a significant barrier to the use and expansion of telehealth services in their respective states.

There is uncertainty about the impact of ABF on funding for services provided using telehealth

Consultation participants consistently reported a lack of clarity about existing ABF arrangements in relation to non-admitted telehealth counting rules. While the current ABF arrangements only recognise and fund the service provider end of a telehealth occasion of service, many consultation participants indicated they are unclear if telehealth occasions of service are recognised at the service provider and/or receiver end¹⁸. The ACI Telehealth Guidelines contain some information about ABF and how it relates to telehealth. There is scope to expand on and update this information further to clarify understanding of this complex area.

Some consultation participants also reported the limitation of only funding the service provider end of a telehealth occasion of service has created financial disincentives that discourage some clinicians from participating at the receiving end of telehealth consultations.

The ABF Taskforce within MOH has consulted extensively with clinical groups on ABF arrangements related to non-admitted telehealth funding rules. NSW MOH agreed both the provider and receiver end of a telehealth consultation should be funded to remove any perceived financial disincentives to using telehealth-enabled care. IHPA has found there is significant support from stakeholders, including NSW MOH, to fund telehealth at both ends of the consultation (Independent Hospital Pricing Authority, 2014). IHPA has agreed in 2015/16 to introduce payment for both ends of the telehealth consultation. The ABF Taskforce reported this model will be adopted in NSW. From 1 July 2015, NSW Health will fund non-admitted telehealth activity at both ends of a telehealth consultation. MOH indicated it expects this will reduce some of the uncertainty around ABF funding currently reported by consultation participants.

In an Australian first, Queensland has modified its ABF arrangements to fund eligible outpatient telehealth services at both the receiver (patient end) and the provider end, and to include an admitted patient telehealth event payment to the provider-end Hospital and Health Service that is providing eligible admitted patient telehealth services (Department of Health (Qld), 2013). In contrast to the national ABF counting rules, Queensland allows a telehealth occasion of service to be reported once by the provider and once by the recipient (rather than only allowing a service event to be counted once).¹⁹

Technological factors, such as inadequate bandwidth and unsuitable technology, hinder telehealth services

The majority of consultation participants identified inadequate bandwidth and technology that is unreliable, inflexible, not user-friendly and not suited to the clinical situation as barriers to the uptake

and integration of telehealth into models of care. These have previously been discussed from the perspective of a critical success factor in section 4.2.2 and an enabler in section 4.3.1.

Better connections/more reliable connections are the single largest barrier [to the uptake of telehealth services] - over the last 2 years, probably 50% of the time it was possible to get high quality, consistent connections [sic] - Doctor, rural LHD (online survey)

¹⁸ NSW NAP data collection rules state that telehealth occasion of service is counted on both ends of a telehealth consultation regardless of funding arrangements.

¹⁹ Queensland Health (2013), *Health Funding Principles and Guidelines 2013-2014*, [Online], available at

https://publications.qld.gov.au/storage/f/2014-06-06T04%3A24%3A00.515Z/health-fund-pples-n-guidelines-13-14.pdf, [Accessed on 22 January 2015]

The views of consultation participants were supported by results from the survey. Over 60% of survey respondents (235 respondents) agreed or strongly agreed technological requirements (e.g. bandwidth, user-friendly equipment or infrastructure) were a significant barrier to the uptake of telehealth in their workplace (see Figure 20). In addition, the top theme from free text survey responses was cited by 33% of survey respondents (58 respondents) and related to inappropriate or inadequate technology and information technology infrastructure issues (e.g. technology that does not suit requirements or is complicated to use, inadequate bandwidth and poor connections) as a key barrier to the uptake of telehealth in their workplace.

Figure 20: Extent to which survey respondents agreed technological requirements were a significant barrier to the uptake of telehealth in their workplace (n=419)



Inadequate systems are in place to support effective telehealth scheduling

Consultation participants consistently reported the absence of an effective, fit-for-purpose scheduling

system supported by a comprehensive contact list is a significant barrier to the use of telehealth services.

Scheduling is the foundation of a telehealth service. If you can't make the booking, how do you deliver telehealth? - Telehealth support manager (stakeholder consultation)

Difficulties with booking facilities (including

consultation rooms and rooms equipped with videoconferencing equipment), and scheduling consultations between clinicians and patients were reported to result in inefficiencies and a greater administrative burden than associated with organising face-to-face clinics. The lack of an LHD/SHN or a state-wide standardised contact list was also identified by consultation participants as a significant barrier for the provision of telehealth services within and across LHDs and SHNs.

HNELHD has recently overcome this barrier by implementing a fully integrated and standardised telehealth scheduling and booking system across the LHD. An existing product was used but underwent 12 months of enhancements to ensure it was fit-for-purpose for users and could integrate with existing HNELHD systems. The system links over 112 sites, 1,000 rooms, and supports 10,000 telehealth bookings per month. WA has also recently purchased a state-wide scheduling system.

4.3.3 A range of state-wide settings are required to optimise and sustain telehealth use

A range of state-wide settings are required to optimise and sustain the use of telehealth across the state. These have been informed by discussions with consultation participants, responses from survey participants and the broader literature, and draw from the identified enablers of and barriers to uptake of telehealth. The main state-wide settings are outlined in Table 8.

Table 8: State-wide settings for telehealth in NSW

State-wide settings

A central governance body for telehealth that has a strategic role.

This body should utilise existing governance arrangements. Two options suggested by consultation participants include:

- using the existing eHealth Council, noting their terms of reference would need to be extended to cover clinical service delivery related to telehealth
- a subgroup of the eHealth Council, including relevant sector representatives from outside the Council, with a specific terms of reference related to telehealth that includes clinical service delivery focus.

The membership of this eHealth Council subgroup may be similar to that of the Queensland Telehealth Governance Committee which comprises representatives from the public health system, primary practice, non-government organisations, peak bodies and educational institutions.²⁰

The relationship of this new central body with other existing arrangements (including the Rural eHealth Governance Group and Telehealth Managers Forum) will need to be clarified. Similarly, the role of this central governance body and the other relevant health central agencies will need to be clarified.

The operation of the central body should be consistent with the devolved model of health in NSW, allowing LHDs the flexibility to implement telehealth in a way that is appropriate to the local context.

A clearly articulated vision and strategic direction for telehealth in NSW.

The use of telehealth-enabled models of care across the state should be guided by a clear vision and strategic direction, against which success can be measured. The vision comprises a longer term goal. Given the current level of maturity of telehealth in NSW, there should continue to be a focus on telehealth as an enabling technology in the short to medium term.

The vision should consider how telehealth operates within the public sector as well as with service providers in the private and non-government sectors. The importance of considering this early was highlighted by consultation participants in jurisdictions with more mature delivery of telehealth than NSW (including Queensland and WA).

A suggested vision is as follows: Telehealth enables access to integrated, high quality, patientcentred and safe clinical care through remote delivery between a health professional and patient, or between health professionals.

²⁰ Representatives are from general practice (a rural GP chairs the Committee), Queensland Health (including Executive Directors, Senior Directors and Directors of relevant branches), Health and Hospital Services (a Chief Executive and a staff specialist), the state branch of the Australian Medical Association, the Australian College of Rural and Remote Medicine, the University of Queensland, the Rural Flying Doctor Service, CheckUp, and Mt Isa Centre for Rural and Remote Health.

State-wide settings

An agreed definition of telehealth.

An agreed definition used across the state will ensure a common understanding of the scope of telehealth.

An effective approach to change management.

Effective change management will help to reduce clinician resistance to adopting telehealth technologies and support the embedding of telehealth into business-as-usual.

This may include the use of financial incentives. For example, QLD Health recognised the development of clinical champions would be critical to the introduction and uptake of telehealth and, from early on, identified specialist doctors interested in using telehealth and provided them with financial incentives and other support to enable them to establish, grow and research telehealth models of care. Years later, these specialists now tend to be in senior roles (e.g. department heads) and have typically developed robust models of telehealth champions and have contributed to the telehealth evidence base, have become strong telehealth champions and have developed strong relationships with QLD Health. Most of these clinicians still receive some funding from QLD Health but less than initially.

ABF arrangements that recognise telehealth activity at both the receiver and provider ends.

Modifications to NSW's ABF arrangements that count telehealth occasions of service at both the receiver and provider ends of a consultation would overcome some of the financial disincentives that currently discourage some clinicians from participating in telehealth. The ABF Taskforce within MOH reported they will be adopting a funding model that provides payment for both the provider and receiver end for non-admitted telehealth activity, given the Independent Hospital Pricing Authority (IHPA) has agreed to introduce this payment model in 2015/16. As discussed in section 1.1.1, Queensland has modified its ABF arrangements to address this issue and IHPA pricing rules will change in NEP15.

Funding and a strategic approach to support the establishment of new innovative telehealthenabled models of care.

Innovative telehealth-enabled models of care may not be able to be implemented without funding support. Victoria has established an innovation fund which is intended to support the development of new telehealth projects as well as the expansion of selected existing project and evaluation of existing telehealth projects. Queensland also provides one-off incentive funding for projects.

A strategic approach to identifying and disseminating information about models of care that are innovative, successful and sustainable will support the uptake of innovation more broadly across the state. For example, an element of such an approach may be that ACI is planning to commence a community of practice for clinicians across NSW.

State-wide provision of the basic technology infrastructure required to enable the use of telehealth.

The provision of the basic technology hardware and software, particularly that which provides adequate bandwidth, across the state is required to enable the use of telehealth, facilitate interoperability of systems and support effective scheduling.

State-wide settings

State-wide policy statements that clarify telehealth-related issues.

Particular issues highlighted for clarity relate to medico-legal, ethical, confidentiality and security concerns.

The inclusion of KPIs in service agreements with all LHDs/SHNs.

Measurement of performance against such KPIs would actively encourage the uptake of telehealth in LHDs/SHNs. KPIs should encourage the use of telehealth only where clinically appropriate.

Queensland has included telehealth KPIs in service agreements with some Health and Hospital Services. For example, the service agreement between Central West Health and Hospital Service and Queensland Health includes the following KPI – "a target of a 10% increase in the number of non-admitted patient telehealth service events reported above the 2013/14 baseline "²¹.

Data capture mechanisms that enable collection and analysis of telehealth data across NSW.

This requires the state-wide use of an identifier for telehealth-enabled occasions of service and is important for service planning and continuous improvement.

From a patient perspective, there is currently little evidence (other than anecdotal evidence) about what the telehealth experience looks like. As the key recipients of clinical telehealth services, it is important to determine if telehealth is enabling their needs to be met and where there are areas for improvement. As such, mechanisms to capture data about patient experience are required.

The provision of core telehealth training for relevant NSW Health staff.

The provision of core telehealth training across the state will help to increase staff awareness, understanding and uptake of best clinical practice telehealth-enabled models of care.

5 Recommendations

The review identified a single overarching strategic priority for telehealth in NSW, identified in Figure 21, and 22 recommendations to support the embedding and enhancing of telehealth across the state.

Figure 21: Overarching strategic priority for telehealth in NSW

LHDs/SHNs are responsible for driving local uptake of telehealth-enabled models of care that are embedded into business as usual and all NSW Health agencies with a role in telehealth are responsible for enabling the LHDs/SHNs to do this.

²¹ Queensland Health (2014), Central West Hospital and Health Service Service Agreement 2013/2014 – 2015-2016 December 2014 Revision, [Online], available at <u>www.health.qld.gov.au/system-governance/health-system/managing/default.asp</u>, [Accessed 22 January 2015]

The 22 recommendations are presented in a high level implementation plan (see Table 9) according to the components of the organisation architecture framework. This plan outlines the timeframe within which each should be implemented and which organisation is responsible for implementation. The timeframe is described by one of the two phases outlined in Figure 22.





These recommendations should be read in the context of the following:

• These recommendations have not been costed and are for consideration by NSW Health. Accepted recommendations will need to be implemented within existing resources.

These recommendations will *contribute* to achieving the desired state of telehealth usage across NSW. They do not represent an exhaustive list and there are other actions key health organisations and agencies will need to take to reach the desired state.

Component of organisation architecture	Immediate actions (to be implemented prior to 30 June 2015)	Short term actions (progressive implementation from the 2015-2016 financial year)
	Prepare	Action
Governance	 A. MOH to coordinate with key stakeholders to consider a central body to act as a peak governance body for telehealth. It should utilise existing governance arrangements, have responsibility for telehealth governance at a strategic level and could have the following functions: overseeing implementation of the recommendations from this strategic review of telehealth setting direction for telehealth in NSW monitoring telehealth developments at the national level, particularly IHPA determinations encouraging the uptake of telehealth through development of an implementation plan and a measurement framework to be 	
	overseen by this group (with future inclusion of KPIs in service agreements for all LHDs) monitoring delivery of telehealth 	

Table 9: High level implementation plan

Component of organisation architecture	Immediate actions (to be implemented prior to 30 June 2015) Prepare	Short term actions (progressive implementation from the 2015-2016 financial year) Action
	 across the state to ensure it is occurring in a manner consistent with the articulated direction ensuring an effective change management approach at the state level to support embedding of telehealth into business-as-usual (including through the use of financial incentives) driving local innovation and prioritisation of telehealth-enabled models of care, including exploring funding mechanisms to support this providing guidance about key activities that should be standardised across the state (e.g. secure information storage, data collection) overseeing the development a core training package about best clinical practice in relation to telehealth, to be developed and delivered by HETI. The operation of the central body would be consistent with the devolved model of health in NSW, allowing LHDs the flexibility to implement telehealth in a way that is appropriate to the local context. 	
Purpose/ Strategy	B. NSW Health to adopt an agreed definition of telehealth and to consider adopting the following definition: telehealth is the delivery of health care at a distance using information and communications technology ²² .	C. Peak governance group ²³ to articulate a vision for telehealth in NSW and measures of success. The vision should include how telehealth operates within the public sector as well as with key external health stakeholders including General Practitioners (GPs), private specialist practices, Residential Aged Care Facilities and non-government organisations (NGOs).
Service and value delivery	D. ACI and MOH ABF Taskforce to continue to provide clarification about the ABF and how it applies to telehealth, with ACI to include this clarification in the final version of the ACI Telehealth Guidelines.	 <i>MOH</i> to consider making representations to the Commonwealth Minister for Health to amend the Medicare Benefits Schedule to remove the financial disincentives created by the MBS, particularly to: extend eligibility for telehealth billing to patients who live within metropolitan (RA1 classified)²⁴ areas and who have difficulty accessing health care services (e.g. people with a disability)

²² Wade, V. (2014), *How to make telehealth work: defining telehealth processes and procedures*, [Online], available at <u>http://www.e-unicare.com.au/wp-content/uploads/2013/06/unicare_ebook.pdf</u>, [Accessed 5 January 2015)

²³ See recommendation 'A' under *Governance*.

 ²⁴ This excludes patients who live in eligible residential aged care facilities or who are at an eligible Aboriginal Medical Service/Aboriginal Community Controlled Health Service as these patients are already eligible for telehealth billing.

Component of organisation architecture	Immediate actions (to be implemented prior to 30 June 2015)	Short term actions (progressive implementation from the 2015-2016 financial year)
	Prepare	Action
		 enable GPs to bill for patient consultations conducted using telehealth
		 enable nurse practitioners to bill for patient consultations conducted using telehealth.
		 enable clinicians providing consultation as part of a multi-disciplinary team to bill for telehealth consultations
		 enable allied health professionals to bill for patient consultations using telehealth
		 enable billing by clinicians consulting with each other about a patient when the patient is not present (e.g. consultations between a GP and a specialist, consultations between a specialist and a sub-specialist).
		 <i>MOH</i> to continue to work with IHPA to explore ABF funding of telehealth activities for Emergency Departments and admitted patients.
	E ACI to incorporate the best practice use	H. MOH to clarify to NSW Health system stakeholders that from 1 July 2015 NSW Health will fund non- admitted telehealth activity at both the provider and receiver end.
	<i>F. ACI</i> to incorporate the best practice use of telehealth in models of care and critical success factors identified in this review in the revised ACI Telehealth Guidelines.	I. eHealth and ACI to explore how best to capture and communicate innovation in telehealth-enabled models of care. Example mechanisms include informal information exchange through the Telehealth Managers Forum and information exchange through the ACI's Innovation Exchange portal.
		J. LHDs/SHNs to require telehealth-enabled models of care to be evaluated at a minimum within five years of implementation and then at regular intervals to support continuous improvement in line with evaluation best practice.
External alliances and partnerships		K. LHDs/SHNs to identify and build effective alliances and partnerships to support best practice telehealth- enabled models of care. These alliances and partnerships should include Primary Health Networks, GPs, providers of private specialist services, Residential Aged Care Facilities, other local health providers who may receive input via telehealth, NGOs that deliver services, and organisations that can provide particular expertise (e.g. universities and/or software developers).

Component of organisation architecture	Immediate actions (to be implemented prior to 30 June 2015)	Short term actions (progressive implementation from the 2015-2016 financial year)
	Prepare	Action
Business processes		L. MOH to develop a policy statement to address perceived medico-legal, ethical, confidentiality and/or security issues (including ownership and transfer of patient records between hospitals and external care providers, and ownership of digital photography records).
		<i>M. LHDs/SHNs</i> to consider the value of inclusion of KPIs in contracts with individual clinicians.
Workforce		<i>N. HETI</i> to provide core training for relevant NSW Health staff about best clinical practice in relation to telehealth (e.g. medico-legal, ethical, confidentiality, security issues). Development of the training package should be overseen by the peak governance group ²⁵ .
Culture		O. LHDs/SHNs to design and implement an effective change management strategy when establishing new telehealth-enabled models of care.
Physical assets	P. eHealth to continue to focus on establishing the basic infrastructure to enable telehealth to operate state-wide. This includes ensuring all locations have access to adequate bandwidth and infrastructure is standardised to the extent that it enables interoperability of systems across LHDs/SHNs.	
		<i>Q. eHealth</i> to implement mechanisms to identify and support the uptake of new technologies to provide appropriate telehealth solutions for clinical problems, particularly personal devices such as mobile phones and tablet computers.
		<i>R. Health Infrastructure (NSW)</i> to consider telehealth in planning and design as part of the Australasian Health Facility Guidelines (AusHFG) to ensure the necessary technology is in place or can easily be added to new facilities, and appropriate facilities are available for the provision of services via telehealth.
Organisation structure		 S. LHDs/SHNs to prioritise a dedicated role/s (e.g. telehealth coordinator role) with the following capabilities and responsibilities to drive the uptake of telehealth within their jurisdiction: o providing oversight of telehealth within the

²⁵ See recommendation A under *Governance*.

Component of organisation architecture	Immediate actions (to be implemented prior to 30 June 2015)	Short term actions (progressive implementation from the 2015-2016 financial year)	
	Prepare	Action	
		 LHD/SHN driving the strategic direction for telehealth within the LHD/SHN facilitating, supporting and promoting best practice uptake of telehealth with the LHD/SHN through clinician engagement, change management and risk minimisation providing support to LHD/SHN staff who wish to the term of term of	
		 investigate/establish a new telehealth-enabled model of care supporting the evaluation and continuous improvement of telehealth services developing and maintaining knowledge of telehealth technologies in a clinical context to support the provision of safe, reliable, patient focused care ensuring collaboration between the strategic, technical and clinical elements of telehealth within the LHD/SHN collaborating with staff in other LHDs/SHNs with a similar role to share learnings and innovative ideas. 	
Roles and accountabilities		T. Peak governance group ²⁶ to clarify the roles and responsibilities of the MOH, eHealth, ACI, HealthShare NSW, HETI and LHDs/SHNs in relation to telehealth and ensure these are clearly communicated.	
Information management		 U. eHealth to implement technology solutions to enable effective scheduling for telehealth consultations. This may involve finalising a global contact list, implementing a state-wide scheduling system and/or providing guidance on standardisations that will enable the different existing scheduling systems to talk to each other. V. MOH and eHealth to investigate how best to capture sufficient data to enable an analysis of telehealth usage across NSW and its benefits, including the need for an identifier for telehealth consultations. W. Bureau of Health Information to consider collecting information on patient Surveys 	

²⁶ See recommendation A under *Governance*.

Appendix A NSW LHD and SHN case studies

As part of the strategic review of telehealth in NSW, Nous conducted extensive consultations at seven case study sites in NSW. The aim of the case study consultations was to explore identified good practice models of telehealth in NSW, including elements of success, benefits and other outcomes.

The seven case study sites were agreed with the Project Steering Group. These sites are listed below and a case study for each is presented in the subsequent sections of this appendix:

- Far West LHD
- Hunter New England LHD
- Northern Sydney LHD
- Sydney LHD
- Sydney Children's Hospital Network
- Nepean Blue Mountains LHD
- Murrumbidgee LHD.

Draft case studies were provided back to the relevant LHD/SHN for review and finalised based on the feedback received.

A.1 Medical oncology services – Far West LHD

Specialty	Medical oncology
Service provider	Royal Adelaide Hospital - oncologist
Service receiver	Cancer Services Broken Hill (FWLHD) – multidisciplinary medical oncology team
Target group	Patients with cancer who receive chemotherapy or who require urgent review
Technology	Video-conferencing
Commencement	2009

What does the telehealth-enabled model of care comprise?

An oncologist at the Royal Adelaide Hospital delivers medical oncology services to Broken Hill in the FWLHD through video-conferencing. The oncologist provides care to patients who receive chemotherapy or need urgent review through monthly telehealth clinics. The oncologist generally sees between eight and ten patients per clinic (including both new and follow-up appointments). The telehealth service is complimented by occasional face-to-face appointments undertaken when the oncologist travels to Broken Hill.

The service also involves a multidisciplinary medical oncology team located in Broken Hill. This team includes a psychologist/counsellor, palliative care staff and a cancer care coordinator. Once a telehealth consultation has been completed, the patient immediately sees a member of the multidisciplinary team locally who provides any additional support or explanation (e.g. about new treatment protocols).

The medical oncology telehealth service began with a pilot program in 2009-10 and is now supported by a dedicated telehealth coordinator.

What enablers support success of the model?

Key enablers of the telehealth-enabled medical oncology model related to the areas of purpose/strategy, business processes, workforce, culture and organisation structure, as outlined in Figure 23.

Purpose / Strategy	Business processes	Workforce	Culture	Organisation
 Telehealth features in the LHD's strategic plan FWLHD obtains its IT services from WNSWLHD and will benefit from a telehealth plan currently being developed by WNSWLHD 	 Smooth and efficient organisation prior to the clinic (to maximise benefit obtained from the consultation and reduce time wastage) Automated Medicare billing process Effective scheduling 	 Staff working on or with the telehealth model are driven and committed to its success Adequate clinical capacity and skills at the local site in Broken Hill Telehealth champions 	 Motivated clinical leadership Staff are committed to the success of the model and the provision of the best outcomes for patients on the day 	• A telehealth manager (funded by WNSWLHD) happens to be located at the local site in Broken Hill and is able to provide support to the service

Figure 23: Enablers of the telehealth-enabled medical oncology model

What are the benefits of the model?

A range of benefits associated with the use of the model were identified (as outlined in Figure 24) and primarily relate to patients and their families/carers.

Figure 24: Benefits associated with the telehealth-enabled medical oncology service

Patients and their families/carers	 ✓ significantly reduced patient travel ✓ reduced wait time for an appointment with an oncologist ✓ enables easier assessment of patients to determine if they require evacuation ✓ additional support for patients as more family members can be involved in the appointments 	
Health care workers	✓ reduced travel by specialists	
Health system	✓ reduced government expenditure on travel assistance for isolated patients	

What lessons have been learnt?

The implementation and operation of the telehealth-enabled medical oncology model has given rise to a number of key learnings, as outlined in Figure 25.

Service and value delivery	Business processes	The workforce
 Funding for telehealth must cover the extra administrative time required to set-up and prepare for each telehealth clinic Current MBS billing eligibility criteria can create a financial disincentive to use telehealth (e.g. telehealth consultations can only be billed for patients who live in eligible areas) There needs to be greater clarity about the impacts of ABF on telehealth, particularly in relation to how telehealth is counted The inability of the oncologist to physically examine a patient may result in important information about a patient's condition being missed 	 Telehealth clinics generate additional preparatory work for which sufficient time must be allowed Overcoming scheduling difficulties reduces delays for patients Accurate and adequate note-taking during telehealth consultations by clinical staff in Broken Hill ensures important short term actions are captured and implemented as it can take up to a week for the oncologist's report of the consultation to be provided to the local care team Provision of all necessary patient information by the clinical staff in Broken Hill to the oncologist prior to the consultation enables the oncologist to be fully informed 	 The model relies on specific individual oncologists (i.e. those who are willing to be involved in telehealth), increasing the risk of model failure if the individuals are no longer willing or able to be involved Model success relies on the presence of appropriate and adequate clinical capacity and skills at the local site in Broken Hill
t Culture	Physical assets	0 Information management
 Overcoming clinician resistance to using telehealth enables the model to operate – resistance may be due to a lack of understanding about how to use the technology and how to be correctly reimbursed for providing telehealth services, and a perceived increase in workload generated by telehealth Effective change management is critical to ensuring people are willing to use telehealth 	 Videoconferencing systems must be cost-effective to be adopted Interoperability issues (between NSW and SA) must be overcome to enable the model to work – e.g. SA Health oncologists are unable to access Broken Hill's eMRs, requiring staff in Broken Hill to collate and fax all necessary patient information to the oncologist in SA Bandwidth must be adequate to support videoconferencing Adequate facilities that are readily accessible by staff and patients are required to support the effective use of videoconferencing (e.g. rooms that are quiet and large enough for consultations and have waiting areas) Reliability of videoconferencing equipment is crucial 	 Security issues related to people external to the LHD being able to access internal LHD systems must be addressed Perceived security concerns (related to usage of the internet for videoconferencing and transmission of patient information) must be addressed

Figure 25: Lessons learnt

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A.2 Outpatient services – Hunter New England LHD

Specialty	Outpatient services across a range of specialties in ambulatory care including (but not limited to) surgery, respiratory, cardiology, endocrinology (including diabetes), gynae-oncology, neurology, mental health, cancer services, genetic counselling, orthopaedics, pain medicine and paediatric services (including paediatric palliative care)
Service provider	Outpatient services throughout HNELHD
Service receiver	Patients across HNE and some adjacent LHDs (including but not limited to Mid North Coast, Northern NSW and Central Coast LHDs)
Target group	Patients requiring review in an outpatient setting
Technology	 Hospital to hospital videoconferencing via Polycom/Tandberg systems Hospital to home/GP practice/AMS/Residential Aged Care Facility via Scopia Some models also use iPads
Commencement	Ongoing roll out across all specialities and specialists, with home telehealth starting in 2012

What does the telehealth-enabled model of care comprise?

Teams across a range of specialties provide outpatient services primarily through videoconferencing and also iPads to patients across the HNELHD and some adjacent LHDs. Some specialities are further advanced in their use of telehealth than others; case study participants attributed this to the presence of strong clinical telehealth champions in specialties that are further advanced. Some specialists run dedicated 'telehealth only' clinics, while other specialists run outpatient clinics that involve a mix of telehealth and face-to-face appointments.

The outpatient telehealth service comprises four models depending on the clinical requirements of the consultation, as outlined in Table 10.

Table 10: Telehealth-enabled models of care and the services that utilise each model within HNELHD

Telehealth model	Services that utilise this approach
Patients are supported at a far site facility (e.g. nursing and/or allied health)	Gynae-oncology, genetics, pain medicine, respiratory, perioperative care, surgery, cancer services, orthopaedics
Patients are unsupported at a far site LHD facility (HNE or other LHD facility)	Cardiology, diabetes, neurology, rehabilitation
Patients are supported at a primary care location (including a GP practice, AMS or residential aged care facility)	Cardiology, diabetes, neurology, surgery, general medicine
Patients are unsupported at home	Paediatric services, cardiology, diabetes, respiratory, endocrinology, neurology, surgery, paediatric palliative care, cancer services, mental health

A team of six staff with technical, clinical and scheduling expertise comprise the HNELHD telehealth unit within the Information Technology and Telecommunications Department and provide support to clinicians, external providers and patients. The two clinical staff support clinicians in the utilisation and change processes required for telehealth adoption. The telehealth unit also manages Australia's first fully integrated scheduling system that supports scheduling and booking activities. This system (iScheduler) was implemented in late 2014 and links 112 sites, over 1,000 rooms, and facilitates 10,000 bookings per month.

What enablers support success of the model?

Key enablers of the telehealth-enabled outpatient services related to the areas of governance, purpose/strategy, service and value delivery, business processes, workforce, culture, physical assets, organisation structure and information management as outlined Figure 26.

Governance	Purpose/Strategy	Service and value delivery
 Support from the Chief Executive, Medicare Locals and Aboriginal Medical Services 	 A telehealth strategy that provides a clear strategic direction An identified need for telehealth services in the community Desire to implement telehealth as a standard mode of communication 	 Services that are clinically suited to using telehealth Provision of services via telehealth that use existing referral networks
Business processes	Workforce	÷ Culture
 Smooth and effective administrative support, planning and coordination (e.g. booking telehealth clinics in the morning to reduce delays created by late-running face-to-face morning clinics) Effective scheduling Implementing telehealth services within existing clinical teams Implementation of telehealth service was initiated and driven by clinicians Logical ordering of steps to implement telehealth (e.g. making sure the technology works reliably, then identifying clinical champions, and then upskilling support staff) 	• Staff with technical capability available for rapid issue resolution for both clinicians and patients	 Willingness of GPs to participate in telehealth Strong clinical will and clinical champions to drive uptake of telehealth Clinical teams that are willing to be innovative
Physical assets	Organisation structure	Information management
 Reliable, simple technology that is easy to use – Scopia easily links all NSW Health videoconferencing systems with corporate computers and securely with personal devices Adequate and appropriate equipment 	• A dedicated and adequately resourced telehealth team to drive uptake and integration of telehealth. The team has both technical and clinical knowledge and experience.	• Data collection and monitoring processes are in place to enable the demonstration of benefits of telehealth (e.g. data is collected about the number of kilometres saved due to reduced travel)

Figure 26: Enablers of the telehealth-enabled outpatient care model
What are the benefits of the model?

A range of benefits associated with the use of the model were identified²⁷ (as outlined in Figure 27) and primarily relate to patients and their families/carers, and health care workers.

Figure 27: Benefits associated with the telehealth-enabled outpatient services

Patients and their families/carers	 increased equity and access to care improved clinical care better informed about procedures/conditions reduced travel care received closer to home reduced social isolation reduced cost
Health care workers	 ✓ increased ability to deliver time-critical care ✓ reduced appointment durations ✓ reduced travel for clinicians ✓ improved collaboration and linkages between specialists and GPs ✓ capacity building and support for local clinicians ✓ able to provide better clinical care
Health system	 ✓ potential to see more patients (due to reduced appointment times) ✓ reduced demand on patient transport services ✓ cost savings (from reduced need for patient transport services)

What lessons have been learnt?

The implementation and operation of the telehealth-enabled outpatient care model across a range of specialties has given rise to a number of key learnings²⁸, as outlined in Figure 28.

²⁷ Figure 1 includes benefits identified by case study consultation participants, as well as benefits described in the *Evaluation of the Kaleidoscope paediatric palliative care services tele-pad project – summary of key findings and recommendations* (Dr Sharon Ryan 2014) and the HNELHD Telehealth patient information brochure (HNELHD n.d.)

 ²⁸ Lessons learnt have been drawn from case study consultations and the following two documents: *Evaluation of the Kaleidoscope paediatric palliative care services tele-pad project – summary of key findings and recommendations* (Dr Sharon Ryan 2014) and the *Executive Leadership Team Meeting Briefing* (Ashley Young 2014).

Governance	Service and value delivery	Business processes
• There needs to be support for the use of telehealth from the executive, senior managers and senior clinicians	 Current MBS billing eligibility criteria has created a financial disincentive to use telehealth (e.g. telehealth consultations can only be billed for patients who live in eligible areas) There needs to be greater clarity about MBS billing eligibility for nurse practitioners who provide telehealth services There needs to be greater clarity about how ABF will affect/influence telehealth Telehealth should be used alongside current services and referral pathways Some patients and conditions are not suited to the use of telehealth technology Specialists providing care via telehealth may not be aware of the local context or situation which has implications for the care the patient is able to receive locally 	 Telehealth needs to be integrated into business as usual Overcoming scheduling difficulties reduces delays for patients and makes the booking process much easier for health care teams Telehealth clinics initially generate additional preparatory work for which sufficient time must be allowed. Teams that have embedded telehealth into their practice do not have this issue. One LHD does not support HNE outpatients as they do not have rooms suitable for patient consultations and GPs are not funded through Medicare to support these patients
Workforce	Culture	Physical assets
 Each specialty that uses telehealth needs dedicated telehealth resources Few neurology health care teams are able to provide services via telehealth as clinical skill translation into telehealth is particularly difficult in neurology and there are no training programs for teleneurology 	 Overcoming clinician (particularly doctor) resistance to using telehealth enables the model to operate – resistance may be due to a lack of understanding about how to use the technology and how to be correctly reimbursed for providing telehealth services, and a perceived increase in workload generated by telehealth. One way to help overcome resistance is to provide clinicians with data that demonstrates the benefits to patients of using telehealth (e.g. costs incurred due to travel, days away from home) Effective change management is critical to ensuring people are willing to use telehealth Some patient groups (particularly elderly patients, Aboriginal patients, and culturally and linguistically diverse patients) may be initially resistant to using telehealth 	 Bandwidth must be adequate to support telehealth, particularly in rural areas Adequate facilities are required to support the effective use of telehealth (e.g. rooms that allow specialists to conduct consultations in private) Adequate equipment is required to ensure effective use of telehealth Scopia enables any computer with a webcam and speakers, as well as mobile devices, to connect securely to HNE clinicians A layer of complexity is created when there are a range of different types of software that are required to enable telehealth consultations to be undertaken (e.g. different plugins)

Figure 28: Lessons learnt

A.3 Spinal cord injury chronic pain clinic outpatient service – Northern Sydney LHD

Specialty	Spinal cord injury pain management
Service provider	Greenwich Hospital Spinal Cord Injury Chronic Pain Clinic
Service receiver	Patients across NSW, and their case managers and GPs when appropriate
Target group	Patients with chronic pain due to spinal cord injury, and their families and carers
Technology	Video-conferencing
Commencement	2014

What does the telehealth-enabled model of care comprise?

The Spinal Cord Injury (SCI) Chronic Pain Clinic team, based at Greenwich Hospital in NSLHD, delivers specialist SCI pain management services to patients across NSW using video-conferencing (Vidyo). Comprehensive care is provided by a multidisciplinary team consisting of a medical specialist, a physiotherapist and a clinical psychologist. Currently, participants in the pain program are individually funded either through WorkCover NSW insurance providers or the NSW Lifetime Care and Support Authority.

Patients are referred to the clinic by their case manager, GP or spinal specialist. The clinical team (i.e. the medical specialist, physiotherapist and clinical psychologist) conduct a pre-assessment session via telehealth with the patient and their case manager to determine whether they are clinically appropriate and ready to receive pain management services through this model of care. Patients then attend a face-to-face appointment at Greenwich Hospital during which they receive review, assessment and treatment planning from the multidisciplinary team. The multidisciplinary team then provides intensive follow-up over a 12 month period (at 1, 2, 3, 6, and 12 months) via telehealth to review pain management strategies and the patient's progress.

The SCI Chronic Pain Clinic began with a pilot program in early 2014, as part of a Lifetime Care and Support Authority funded Chronic Pain and SCI Project. The telehealth service has been incorporated into this model of care in order to facilitate access to specialty pain services for individuals with SCI where logistical issues such as mobility, general health, place of residence, transport or personal care may otherwise inhibit access.

Seven patients have been managed using this model of care since its launch, including six patients from around metropolitan Sydney and one patient from rural NSW. As part of the service, a range of supporting resource material has been developed including the SCI Pain Book, the SCI Pain Workbook, the ACI Pain Management Network website and an SCI resource package for all NSW Pain Clinics.

What enablers support success of the model?

Key enablers of the telehealth-enabled SCI Chronic Pain Clinic related to the areas of governance, purpose/strategy, service and value delivery, external alliances and partnerships, business processes, culture and physical assets, as outlined in Figure 29.

Governance	Durpose / Strategy	Service and value delivery		
• Senior management commitment to the model	 The telehealth service is meeting a specific clinical need and provides a suitable solution to the need Collaborative and iterative design of the model to ensure it is fit-for-purpose and to support clinician ownership of the model from the outset 	 Robust planning underpins the development of the model Availability of specialist resources to support the development and implementation of the model (including an ACI telehealth manager, an ACI project officer and ACI Clinical Network managers) Case managers participate with the patient where appropriate to facilitate education and provide support 		
External alliances and partnerships	Culture	Physical assets		
 Support from NSW Lifetime Care & Support Authority through grant funding for the position of the project officer role Support from Greenwich Hospital management and clinical services to pilot the model 	 Clinical champion/s to drive uptake Strong change management approach Staff willingness to try something new/innovative Committed and passionate clinical team A collaborative and cooperative approach to the model by all parties The Chronic Pain Clinic staff had access to the technology (videoconferencing was being used for other purposes in the hospital) and were willing to learn how to use it 	 The technology is flexible and mobile (e.g. patients can use a video-link from their iPhone to participate in the consultation) The technology is simple and user-friendly The technology is both secure and cheap to use, costing the end user less than a long distance phone call The technology provides high quality video and audio data transmission with no obvious delays/latency 		

Figure 29: Enablers of the telehealth-enabled SCI Chronic Pain Clinic model

What are the benefits of the model?

A range of benefits associated with the use of the model were identified (as outlined in Figure 30) and primarily relate to patients and their families/carers.

Patients and their families/carers	 improved access to timely, high quality, specialist services greater convenience reduced travel cost savings (e.g. from reduced travel and accommodation expenses) reduced wait time for appointments enables patients to have greater control as the consultation can occur via videoconference to a location of the patients choice (e.g. home, workplace) greater empowerment for patients who feel their circumstances and experiences are validated by the provision of the majority of their care by a remote specialist team into their local setting greater satisfaction as patients feel their issues are thoroughly explored through the multidisciplinary approach
Health care workers	 ✓ higher quality care through the involvement of the local team (the patient's case manager and GP) in the pre-assessment and follow-up as appropriate ✓ local GPs have access to increased support for complex patients
Health system	 supporting resource material was developed that can be used more broadly (e.g. SCI Pain Book, SCI Pain Workbook, SCI resource package) elements of the model can be leveraged to facilitate the use of telehealth to provide care to other suitable patient groups (e.g. patients with chronic pain)

Figure 30: Benefits associated with the telehealth-enabled SCI Chronic Pain Clinic

What lessons have been learnt?

The implementation and operation of the telehealth-enabled SCI Chronic Pain Clinic model has given rise to a number of key learnings, as outlined in Figure 31.

Figure 31: Lessons learnt

Purpose / Strategy	Service and value delivery			
 Strategic support of telehealth by the LHD is critical to the success of telehealth initiatives Individual clinicians and clinical teams, supported by an enabled telehealth facility within the LHD, are in a better position to develop and implement innovative models of services delivery 	 A structured screening process should take place to ensure patients are suitable for the telehealth model of care as not all patients are clinically appropriate to be seen via telehealth Adequate funding needs to be established to support multidisciplinary programs delivered by telehealth. There is currently limited scope to expand the service to many patients who could benefit as they are not eligible for funding (under the NSW Lifetime Care and Support Authority scheme) and the service could not be adequately funded under current MBS billing arrangements. Patients' need to be adequately and extensively triaged and supported by a local health professional to reduce the potential risk that clinicians remote to the patient may miss signs as they are not physically present with the patient 			
Roles and responsibilities	Business processes			
 Clarity around roles and expectations of staff members involved in managing and delivering the model is important (e.g. a checklist detailing who is responsible for what and when provided greater clarity) 	• There is an increased (and often hidden) additional time burden associated with telehealth consultations. It is important to anticipate and invest adequate time to plan, schedule and carry out telehealth consultations			
Culture	Physical assets			
 Patients can be more likely to cancel appointments last minute when booked for telehealth consultations compared with face-to-face consultations (as they have not invested in overcoming significant logistical issues to attend the face-to-face consultation). Strategies (e.g. reminder mechanisms) to reduce the risk of last minute patient end appointment cancellations or non- attendance at appointments need to be explored Some patients decline to participate in telehealth consultations as they are not comfortable with it. Patients (and staff) need to be thoroughly oriented to a telehealth model of care to optimise confidence with equipment and encourage its use 	 Technical issues (e.g. due to firewalls) can prevent providers and receivers from accessing a video-conference. It is important to arrange for timely technical support for troubleshooting, particularly in the early stages of establishing a telehealth service The use of technology user logbooks is helpful to record any technical complications to improve efficiency of communication with technical support staff when the need arises It is important to establish a schedule for routine maintenance of technology and equipment to ensure efficient service delivery 			

A.4 Aged care services – Sydney LHD

Specialty	Geriatrics
Service provider	Department of Geriatric Medicine at Concord Repatriation General Hospital (Sydney LHD)
Service receiver	Elderly patients and GPs in regional and remote sites across NSW
Target group	Elderly patients in regional and remote sites across NSW
Technology	Videoconferencing (Cisco)
Commencement	2003 (in Broken Hill and Grafton) and later in other sites

What does the telehealth-enabled model of care comprise?

Geriatricians from the Concord Repatriation General Hospital deliver aged care services to elderly patients and GPs as part of joint services in a number of regional and remote sites across three LHDs via videoconferencing. These sites include Parkes, Dubbo and other towns in WNSWLHD, Broken Hill and Dareton in FWLHD, and Grafton in Mid North Coast LHD. Formal service agreements are in place between SLHD and WNSWLHD and FWLHDs.

The services provided primarily comprise cognitive assessments, advice about appropriate management of the consequences of cognitive assessments, medication reviews and comprehensive geriatric assessment of frail older people with multiple chronic conditions provided to elderly patients/GPs who would otherwise not have easy access to specialist geriatric care. Suitable patients are identified by Aged Care Assessment Team (ACAT) staff or community nurses at the remote sites. The patients are discussed with their local GP at which time they may be identified as requiring geriatrician input and being appropriate for a telehealth consultation.

The service is currently near capacity with around ten telehealth clinics held per month across all sites. The telehealth consultations are complemented by face-to-face consultations provided by some geriatricians in Parkes and Dubbo twice a year. These visits also involve upskilling of the local staff (e.g. in doing neurological examinations) to enable them to further assist the geriatricians during telehealth consultations. This is in addition to several education sessions provided by the geriatricians to local staff via telehealth each year.

The service is intended to be expanded into more AMS' in WNSWLHD over the next year and, later, into residential aged care facilities in rural and remote areas.

What enablers support success of the model?

Key enablers of the telehealth-enabled aged care model related to the areas of governance, purpose/strategy, service and value delivery, business processes, culture and physical assets, as outlined in Figure 32.

Governance	Durpose / Strategy	Service and value delivery		
• Support from senior management at the provider and receiver ends – i.e. the LHD Chief Executive and the senior management at remote sites	 The telehealth service is meeting a specific clinical need in the community 	 The remote sites are staffed by skilled and enthusiastic local clinicians who do all the preparatory and follow up work Staff at the remote sites provide clinical support to the patients 		
		• Funding is self-sustaining (FW LHD and WNSW LHD bill Medicare for the consultations and Concord Hospital invoices these LHDs for the clinicians' time – the Medicare rebates more than cover the cost of the clinicians' time)		
Business processes	÷ Culture	Physical assets		
 Formalised agreements for the provision of telehealth-enabled aged care service model between: participating LHDs (i.e. Sydney LHD with each of Far West and Western 	 Telehealth champions at the remote sites Flexibility of geriatricians at the tertiary site Joint ownerchin of the service by 	 Telehealth technology is able to be used for other purposes which makes it more cost effective Appropriate facilities for conducting telehealth consultations at remote 		
NSW LHDs) in the form of service level agreements	Concord Hospital and the remote sites	sites		
 Sydney LHD and the geriatricians who provide the service in the form of contracts 	• A collaborative and cooperative approach to the model by all parties			
• Clinicians at remote sites do adequate preparatory work prior to the telehealth clinics, support patients during consultations, assist with assessments, and coordinate implementation of management plans and follow up (with GPs) to ensure the service runs smoothly				

What are the benefits of the model?

A range of benefits associated with the use of the model were identified (as outlined in Figure 33).

Patients and their families/carers	 improved access to services – patients are able to access services they would not otherwise be able to access easily improved planning and decision making capability for families the majority of patients they were satisfied with the service*
Health care workers	 ✓ reduced burden on local clinicians (particularly in small towns where it can be difficult for local clinicians, primarily GPs, who often see their patients outside of the doctor-patient relationship to deliver 'bad news' decisions to patients – e.g. the geriatrician can tell a patient they can no longer drive rather than the local GP) ✓ upskilling of local clinicians in issues related to geriatric medicine ✓ validation of the skills of the local clinicians (who often do not realise how skilled they are) ✓ the majority of clinicians at the remote sites were satisfied with the service* ✓ geriatricians found the service to be efficient with only minor and infrequent technical issues*
Health system	 ✓ overall, the service is sustainable, responsive, cost-neutral and underpinned by efficient processes and tools[#] ✓ partially addresses inequities in the provision of health care services to rural locations

Figure 33: Benefits associated with the telehealth-enabled aged care service

* According to the findings of service evaluations conducted in 2012 and 2014. # According to the findings of an evaluation conducted in 2015. Additionally, sustainability relies on the ongoing funding of the aged care clinicians at the remote sites.

What lessons have been learnt?

The implementation and operation of the telehealth-enabled aged care model has given rise to a number of key learnings, as outlined in Figure 34.

Service and value delivery	External elliances and partnerships		Business processes		Workforce	
• While accepted by and effective for the majority of patients, telehealth is not suited to some conditions or patients (e.g. patients who are deaf or paranoid)	 Some central government agencies have unrealistic expectations of patients which create challenges for delivering optimal patient care (e.g. Roads and Maritime Service requesting that a patient have a face-to- face geriatrician review to assess driving capacity when there was no geriatrician available within several hundred kilometres – the agency refused the option of a review by a GP, and geriatrician by telehealth) It is challenging for rural GPs (who are often particularly busy) to actively participate in the model of care 		 Telehealth clinics generate additional preparatory work for which sufficient time and resources must be allowed (this is particularly a challenge for small Aged Care Assessment Teams) 		 There is limited capacity through the telehealth clinics to provide follow- up of patients who may need it (e.g. patients with dementia who need ongoing assessments) The model relies on the dedication and commitment of a small number of key people such that personnel changes may result in the service becoming unsustainable 	
Culture • Some patient (particularly A patients) tend resistant to us telehealth	groups boriginal I to be sing	Physica Infrastructure remote sites n adequate to su telehealth	al assets at the nust be upport	 Clinicians at r sometimes re unsecure con mechanisms consultations - this is perce geriatricians t the risk of a p security brea less effective assessment, a therefore dec undertake tel consultations technologies There needs about who is for dissemina specialist's le (typically to t following the 	emote sites equest to use munication for (e.g. Skype) ived by the to increase orivacy or ch and be a medium for and they cline to ehealth using these to be clarity responsible ting the tter he GP) consultation	

Figure 34: Lessons learnt

A.5 Paediatric diabetes clinic – Sydney Children's Hospital Network

Specialty	Endocrinology – diabetes care
Service provider	Sydney Children's Hospital Network's The Children's Hospital at Westmead (CHW) – paediatric endocrinologists
Service receiver	Paediatricians and diabetes teams in regional areas of NSW
Target group	Children and young people with diabetes, and their families/carers
Technology	Videoconferencing (Lync)
Commencement	2012

What does the telehealth-enabled model of care comprise?

Paediatric endocrinologists from CHW provide specialist consultation services to children and young people with diabetes in regional areas of NSW via videoconferencing. Regional areas involved in the service include Orange, Bathurst, Dubbo, Port Macquarie, Nowra and Kempsey.

The paediatric endocrinologists provide diabetes assessment, diagnosis and management services to children and young people, and their families/carers, their local paediatrician and their local diabetes team. A local paediatrician is required to be present at every consultation.

Prior to the launch of the telehealth model, paediatric endocrinologists from The Children's Hospital at Westmead travelled to regional and remote locations to deliver specialist care.

What enablers support success of the model?

Key enablers of the telehealth-enabled paediatric diabetes model related to the areas of governance, purpose/strategy, service and value delivery, business processes, workforce, culture and physical assets, as outlined in Figure 35.

Governance	Purpose / Strategy	Service and value delivery	Business processes
 Support from the Chief Executive and senior management Clear direction from management 	 Telehealth is part of the SCHN strategic plan and every supporting strategic document Telehealth is part of the clinical services plan for paediatric diabetes care 	 Diabetes care is clinically suitable for telehealth The technology is cost effective 	 Smooth and effective administrative support and organisation at both the tertiary and remote sites Processes to ensure the technology and all consultation participants are set up correctly prior to the consultation Clinician driven design and development of the model Availability of central technical support
• Staff were alr with the tech had already b Lync for othe	Force ready familiar nology (they been using r purposes) Culture • Buy-in from patients fee the same lev via telehealt face • Buy-in from	re Physic patients - I they can get vel of service th as face-to- clinicians	cal assets reliable and hology

Figure 35: Enablers of the telehealth-enabled paediatric diabetes model

What are the benefits of the model?

A range of benefits associated with the use of the model were identified across patients and their families/carers, health care workers and the health system (as outlined in Figure 36).

Patients and their families/carers	 ✓ improved clinical care ✓ more convenient ✓ increased access to specialist services
Health care workers	 capacity building of clinicians at the remote sites, particularly paediatricians who are required to participate in all consultations productivity and efficiency gains for the clinicians at the provider end – the telehealth model saved 62% of the paediatric endocrinologists' time that was previously spent delivering the same services face-to-face* reduced travel for specialists better agreement on treatment plans by members of the care team and the patient/family
Health system	 more reliable health care services (specialists are less likely to be delayed due to bad weather, late planes etc.) potential for more patients to be seen (either via telehealth or at SCHN) due to reduced travel burden on specialists – the telehealth model enabled 13% more patients to be seen* cost savings – the telehealth model cost 78% less to run than the face-to-face * model

Figure 36: Benefits of the telehealth-enabled paediatric diabetes model

* According to the findings of an early evaluation of the SCHN telehealth-enabled paediatric diabetes model undertaken in 2012.

What lessons have been learnt?

The implementation and operation of the telehealth-enabled paediatric diabetes model has given rise to a number of key learnings, as outlined in Figure 37.

Service and value delivery	External alliances and partnerships	Business processes
 Effective appointment scheduling and reminding patients of their appointments by staff at the remote sites is necessary to ensure the greatest benefit it derived from the telehealth clinics because they are run at maximum capacity – currently, these clinics are not operating at full capacity If the model was expanded to meet existing demand, it is likely the current requirement for the local paediatrician to be present during all patient consultations would need to cease due to an unsustainable increase in the local paediatricians workload. This would create a risk that patients may receive poorer quality care due to not receiving an adequate physical examination during the consultation. 	• The use of different models to deliver paediatric diabetes outreach services across LHDs (e.g. HNE LHD's model heavily utilises face-to-face consultations while SCHN's model exclusively utilises telehealth in place of face-to-face consultations) can create resistance to using telehealth in staff at remote sites who prefer face-to-face consultations	 Telehealth clinics generate additional preparatory work at the remote sites which can lead to staff resistance to using the telehealth model Provision of all necessary patient information (particularly data downloaded from insulin pumps) to the paediatric endocrinologists prior to consultations enables quality care and ensures an efficient use of time for the clinicians, patients and their families/carer Local paediatricians experience greater pressures on their workloads due to the telehealth clinic model as they are required to be present during all telehealth consultations (but were not required to attend the face-to-face consultations previously undertaken by the visiting paediatric endocrinologists)
*** Workforce	📫 Culture	Physical assets
 Effective and efficient telehealth clinic operation requires locally available technical support at the remote sites Availability of staff at remote sites who are appropriately trained to undertake clinical tasks required for consultations (e.g. downloading data from insulin pumps) is necessary for the smooth operation of the clinics 	 Overcoming resistance of diabetes educators and paediatricians at remote sites to using telehealth enables the model to operate – resistance may be due to a perception the telehealth model is a withdrawal of services compared to the previously undertaken face-to- face consultations and a perception telehealth increases the workload of staff at remote sites 	 Effective operation of the model relies on: appropriate technology reliable technology adequate bandwith at the remote sites an adequate contingency plan to ensure consultations can go ahead even when the technology fails (e.g. via telephone rather than videoconference) Interoperability issues between LHDs/SHNs must be overcome to enable the model to be utilised to greatest benefit

Figure 37: Lessons learnt

A.6 *Hospital in the Home Program* – Nepean Blue Mountains LHD

Specialty	Post-discharge outreach care through the Hospital in the Home Program
Service provider	Nepean Hospital Outreach Clinic specialist doctors and nurses
Service receiver	Nepean Hospital Outreach Clinic nurses
Target group	Patients who have recently been discharged from hospital to their own homes
Technology	iPads and a purpose-built Outreach app
Commencement	2014

What does the telehealth-enabled model of care comprise?

The Nepean Hospital operates the *Hospital in the Home Program* in which nurses visit recently discharged patients in their own homes to provide post-discharge care, primarily comprising management of wounds, anticoagulation therapy and intravenous antibiotic. Nurses typically visit five to ten patients per day.

If a patient's condition has changed, the visiting nurse may be unsure about the appropriate treatment. The nurse can use one of nine iPads and a simple, purpose-built Outreach app to seek advice from clinicians (doctors and other nurses) associated with the Nepean Hospital Outreach Clinic. The Outreach app has the ability to record patient notes, take photos (of wounds) and to videoconference. Any photos are stored and made accessible to staff at the Outreach Clinic (e.g. so they can clearly see how a wound may have progressed over time). The service is supported by a telehealth manager based at Nepean Hospital.

The Outreach app was developed in partnership with Sydney University through the Nepean Telehealth Technology Centre. This partnership enabled NBMLHD to harness external technical expertise and facilitated a highly consultative, iterative app development process. The app was purpose-built to meet the clinical needs of the outreach clinicians.

Those involved in developing the model are in the process of creating a telehealth handbook. Specific guidelines that provide advice for clinicians who use the Outreach app and a troubleshooting manual to enable nurses to fix minor issues themselves have both been developed.

What enablers support success of the model?

Key enablers of the telehealth-enabled *Hospital in the Home Program* related to the areas of governance, service and value delivery, external alliances and partnerships, business processes, culture and physical assets, as outlined in Figure 38.

Figure 38: Enablers of the telehealth-enabled	Hospital in the	e Home Program
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Governance	Service and value delivery	External alliances and partnerships
• A tailored, multi-tiered governance structure (which comprises a Telehealth Steering Committee that oversees all telehealth services; a working party that meets monthly to discuss service-specific operational issues; and a formal relationship between the telehealth and technical managers)	 Iterative design of the model to ensure a fit-for-purpose model A highly consultative approach to develop the service and technology (e.g. technical staff consulted clinical staff and technical staff accompanied clinical staff on home visits) Clinicians had the opportunity to raise issues with or contribute good ideas to the design of the service 	 External partnerships to harness specific expertise - a formal partnership with Sydney University provided necessary technical expertise Close links with IT support services which enables technical issues to be solved rapidly A strong working relationship between clinical, technical and telehealth staff
Business processes	÷ Culture	Physical assets
 Provision of early and adequate training for users of the iPads and app Continuous process improvement Process mapping conducted by the telehealth team 	 Early engagement of and buy-in from clinicians from the development phase Little resistance from patients Clinical champions who drive uptake 	 A purpose-built app that suits the clinicians' work practices (the whole app was developed based on the requirements specified by the users/clinicians) Simplicity of the system which makes it is very easy to use

What are the benefits of the model?

A range of benefits associated with the use of the model were identified for patients and their families/carers, health care workers and the health system more broadly (as outlined in Figure 39).

Figure 39: Benefits associated with the use of telehealth in the Hospital in the Home Program

Patients and their families/carers	 ✓ reduced travel ✓ reassurance for patients (e.g. seeing their progress in pictures) ✓ improved quality of care ✓ improved access to care (faster access and access to services that may not otherwise be available at all) ✓ reduced length of stay in hospital
Health care workers	 ✓ photos enable better clinical decision making ✓ reassurance for Outreach Clinic clinicians (knowing an Outreach nurse can provide updated wound progress images within a few days) ✓ increased convenience for Outreach nurses (i.e. they can travel with an iPad rather than a large number of paper-based records)
Health system	 ✓ possibility to re-use the custom built technology solution for other telehealth services ✓ reduced burden on the ambulance service ✓ reduced length of stay in hospital ✓ reduced readmission rates

What lessons have been learnt?

The implementation and operation of the telehealth-enabled *Hospital in the Home* model has given rise to a number of key learnings, as outlined in Figure 40.

Figure 40: Lessons learnt

Service and value delivery	Business processes
 Current MBS billing eligibility criteria can create a financial disincentive to use telehealth (e.g. telehealth consultations can only be billed for patients who live in eligible areas) 	• The process to explore all potential privacy and confidentiality issues during the model development phase was very time-consuming
💏 Workforce	Physical assets
• The model relies on a small number of key people such that personnel changes may result in a significant loss of knowledge, experience and support capability	• Interoperability issues exist - the Outreach Clinic telehealth systems and software are incompatible with the systems of Nepean Hospital and some other health care facilities
	• Internet connections must be adequate to support use of the technology
	• A database that comprises a back-end component of the app was very time-consuming to develop

A.7 Mental Health Emergency Consultation Service -Murrumbidgee LHD

Specialty	Mental health emergency care
Service provider	Wagga Wagga and Albury Base Hospitals
Service receiver	District and community emergency departments in MLHD
Target group	Patients with mental health issues who require urgent assessment
Technology	Video-conferencing
Commencement	2007

What does the telehealth-enabled model of care comprise?

Specialist mental health assessment and support services are available to district and community emergency departments through Mental Health Emergency Care Service (MHECS) via videoconferencing from Albury and Wagga Wagga. MHECS is staffed 24 hours a day, seven days a week by experienced mental health clinicians and on-call psychiatrists.

When a patient with a mental health problem presents to an emergency department, the MHECS clinicians use video-conferencing technology to provide an initial consultation with initial interim management plan followed by a comprehensive assessment once the patient has been deemed fit for interview.

Wagga Wagga MHECS services are available 24 hours a day, seven days a week, whilst Albury MHECS services operate between 8:00am and 10:00pm. After-hours, hospitals in the Albury catchment area have access to Wagga Wagga MHECS.

Telehealth services are supported by a dedicated telehealth manager for MLHD, as well as a dedicated videoconferencing support manager (during business hours).

What enablers support success of the model?

Key enablers of the telehealth-enabled MHECS model related to the areas of governance, purpose and strategy, service and value delivery, business processes, and physical assets, as outlined Figure 41.

Governance	Purpose / Strategy	Service and value deliverv	Business processes	Physical assets
 Support from the Chief Executive Strong governance arrangements 	 Clear direction and purpose from the project outset The telehealth model is meeting a specific clinical need in the community 	 Understanding of the local context ensures appropriate expectations and support The model is responsive, adaptable, and flexible The telehealth model provides valuable support to clinicians at the local sites 	 Clear policy and procedural guidelines Provision on ongoing technical and clinical support Effective coordination between the sites involved Extensive planning and design process, including consultation with local sites 	 Technology is reliable and of good quality Minimal training is required to use the technology

Figure 41: Enablers of telehealth-enabled MHECS

What are the benefits of the model?

A range of benefits associated with the use of the model were identified and are outlined in Figure 42.

Figure 42: Benefits associated with the telehealth-enabled MHECS model

Patients and their families/carers	 ✓ timely access to high-quality, specialist care (24/7) ✓ access to specialists services that were not previously available ✓ family members and carers can more easily be involved in consultations ✓ enables emergency assessment and management of mental health issues closer to home, reducing the need for travel ✓ reduced waiting times
Health care workers	 ✓ reduced travel to local sites ✓ potential to see more patients (due to reduced travel) ✓ improved relationships and networking between staff at smaller health care facilities and larger hospitals ✓ educational benefit for local health workers
Health system	 cost savings due to reduced transfers and admissions to larger hospitals increased coverage of specialist mental health services with the capacity to
	 provide emergency mental health assessments and consultations to large numbers of emergency departments (not possible with face-to-face services due to a shortage of mental health workers and long distances) reduced burden on local services (e.g. ambulance and police) due to reduced transfers

What lessons have been learnt?

The implementation and operation of the telehealth-enabled MHECS model has given rise to a number of key learnings, as outlined in Figure 43.

External and	ernal alliances partnerships	B usi	ness processes
• GPs need to be aware of the correct process for accessing MHECS services (i.e. through the emergency department, not through the community mental health		Staff at loca aware of th to follow if technical iss videoconfer equipment Clinicians at	I sites need to be e correct process there are sues with the rencing
team)		need to sen managemen local sites ir following th consultation the rapid p appropriate sites	ad patient nt plans to the mmediately ne patient ns to allow for rovision of e care at the local
	Physica	l assets	
 Clinicians may take time to become comfortable managing patients via videoconferencing (it can be difficult to detect important subtle body language or visual cues) There needs to be an adequate change 		 Telehealth technology needs to be reliable Bandwidth needs to be adequate to support high quality video-conferencing There need to be adequate facilities to support the use of video-conferencing (e.g. a dedicated room) 	
process to resistance to th can be			
	Constant of the correct accessing M (i.e. through emergency not through community team) take time to ortable ents via cing (it can be ect important nguage or be an nge process to resistance to the can be enter the constant of the	 External alliances and partnerships GPs need to be aware of the correct process for accessing MHECS services (i.e. through the emergency department, not through the community mental health team) take time to ortable ents via cing (it can be ect important nguage or be an nge process to resistance to th can be important to the text of text of text of the text of tex of text of text of text of text	 External alliances and partnerships GPs need to be aware of the correct process for accessing MHECS services (i.e. through the emergency department, not through the community mental health team) Clinicians at need to services in community mental health team) Clinicians at need to services in consultation the rapid p appropriate sites Telehealth technology needs to be reliable Bandwidth needs to be adequate to support high quality video-conferencing There need to be adequate facilities to support the use of video-conferencing (e.g. a dedicated room)

(e.g. Aboriginal patients)

Figure 43: Lessons learnt

Appendix B References

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Strategic review of telehealth in NSW: Appendices

Companion document to the *Strategic review of telehealth in NSW: Final report*

NSW Ministry of Health

8 April 2015



Bold ideas | Engaging people | Influential, enduring solutions

This *Appendices* document accompanies the *Final Report* on the *Strategic review of telehealth in NSW*. An outline of the contents of the two documents is provided below.



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Strategic review of telehealth in NSW: Appendices

Companion document to the Strategic review of telehealth in NSW: Final report

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Glossary

Term	Description
ACI	Agency for Clinical Innovation
ACT	Australian Capital Territory
ACCRM	The Australian College of Rural and Remote Medicine
AHS	Area Health Service
AMS	Aboriginal Medical Service
CEO	Chief Executive Officer
CHW	Children's Hospital Westmead
СОН	Centre for Online Health (University of Queensland)
DOTS	Directly observed treatment, short-course
ECG	Electrocardiogram
ETS	Emergency Telehealth Service
FWLHD	Far West Local Health District
GP	General Practitioner
HIRC	Health Innovation and Reform Council
HNELHD	Hunter New England Local Health District
ICT	Information and Communication Technology
IT	Information Technology
LHD	Local Health District
MHECS	Mental Health Emergency Consultation Service
MHEC-RAP	Mental Health Emergency Care–Rural Access Project
MLHD	Murrumbidgee Local Health District
МОН	Ministry of Health
MSOAP	Medical Specialists Outreach Assistance Program
NBMLHD	Nepean Blue Mountains Local Health District
NETS	Newborn and Paediatric Emergency Transport
NSLHD	Northern Sydney Local Health District
NST	Norwegian Centre for Telemedicine
NSW	New South Wales
NT	Northern Territory
OTN	Ontario Telemedicine Network

Term	Description
RANZCP	The Royal Australian and New Zealand College of Psychiatrists
RDN	Rural Doctors Network
RHA	Rural Health Alliances
RPAH	Royal Prince Alfred Hospital
SCES	State-wide Complex Epilepsy Network
SCHN	Sydney Children's Hospital Network
SHN	Specialty Health Network
SLHD	Sydney Local Health District
SNSWLHD	Southern New South Wales Local Health District
ТВ	Tuberculosis
тсс	Townsville Cancer Centre
THU	Telehealth Unit
UK	United Kingdom
VST	Victorian Stroke Telemedicine
WA	Western Australia
WNSWLHD	Western New South Wales Local Health District

About this document

This document contains more detailed information to support the key findings and recommendations presented in the *Strategic review of telehealth in NSW: Final report*. It contains:

- a detailed methodology, including data limitations (Appendix A)
- the data collection plan and stakeholder engagement plan that guided the data collection process (Appendices B and C respectively)
- the scoping paper that was presented to and approved by the Steering Group (Appendix D)
- a list of the documents provided by the NSW Ministry of Health (MOH) that contributed to the document review process (Appendix E)
- a summary of demographic information of survey respondents (Appendix F)
- selected additional survey data analyses (Appendix G)
- a comprehensive list of telehealth services in NSW (Appendix H)
- a summary of telehealth usage nationally and in selected international jurisdictions (Appendix I)
- more detailed information on good practice examples of clinical telehealth models nationally and internationally (Appendix J)
- a list of existing policies, strategies and frameworks relevant to telehealth in NSW (Appendix K)
- full references for the sources cited throughout the *Appendices* document (Appendix L).

Insights and recommendations from the data presented in this companion *Appendices* document are presented in the main report.

Appendix A Methodology

This appendix outlines the detailed methodology Nous followed to undertake the strategic review of telehealth in NSW. It also outlines a small number of data limitations that should be taken into account when reviewing the *Final Report*.

1.1 The review was conducted in three stages

The review was conducted in three stages over the six months from October 2014 to March 2015, as shown in Figure 1 and described below.



Figure 1: Stages of the review of telehealth in NSW

Stage 1: Plan the review and conduct desktop analysis

Nous commenced the project by developing key documents to guide the review activities. These comprised a comprehensive:

- project plan
- data collection plan (see Appendix B) which provides a detailed overview of the key questions the review was to answer and our proposed approach to gathering data
- stakeholder engagement plan (see Appendix C) which outlines the guiding principles used when engaging the stakeholders and the purpose, timing and nature of engagement with all key stakeholders consulted during the review
- scoping paper (see Appendix D) which primarily outlines the approach to survey dissemination, and the selection of participants for the consultations and locations for the case studies.

The three plans were endorsed by the MOH and the scoping paper was endorsed by the Project Steering Group.

Nous then undertook desktop research and analysis to:

- inform the development of the data collection tools (comprising a survey and consultation guides)
- provide a deeper understanding of the broad spectrum of telehealth initiatives in operation across the state
- identify key learnings from other Australian states and territories and overseas.

The desktop research was informed by the key lines of enquiry (summarised in Figure 2) and included a review of documents provided by the MOH (see Appendix E) as well as broader literature.





Stage 2: Conduct data collection

Stage 2 consisted of further data collection through an online survey, case study consultations with selected LHDs and an SHN, and consultations with other key stakeholders, followed by an initial analysis of the gathered data to generate key findings. Figure 3 provides an overview of the purpose of and participants in the survey and consultations. Appendix F provides a summary of the demographic information of the survey respondents.



Figure 3: Summary of data collection activities

Stage 3: Prepare report and recommendations

During this final stage, Nous completed the remaining data collection and analysis activities to develop the *Final report* and this companion *Appendices* document.

Nous synthesised the information obtained from the initial desktop review, online survey, and case study and other key stakeholder consultations to distil key findings (detailed in section 4 of the *Final Report*). The key findings outline the current state of telehealth in NSW, characteristics of successful telehealth-enabled models of care, and enablers of and barriers to the uptake of telehealth.

Based on the key findings, Nous developed a suite of recommendations (detailed in section 5 of the *Final Report*) aimed at enabling increased uptake of telehealth in NSW and providing guidance on future strategic direction and oversight. These recommendations are presented as part of a practical and actionable implementation plan that sets out the timeframes over which the recommendations should be implemented.

Drafts of each of the *Final report* and *Appendices* companion document were developed and tested with the Project Steering Group. Both documents were finalised based on the feedback received and submitted to the MOH for endorsement.
1.2 There are some limitations with the data

A small number of limitations to the data should be taken into account when considering the review findings presented in this report:

- Of the 18 LHDs and SHNs in NSW, more than 70% of the survey responses were from four LHDs (Western Sydney LHD (WSLHD), Northern NSW (NNSWLHD), HNELHD and Mid North Coast LHD (MNCLHD)) while one LHD (Far West LHD (FWLHD)) had no responses. This disproportionate spread of responses should be taken into account when considering the survey data. Appendix G (in the *Appendices* companion document) details the number of survey responses per LHD.
- Of the 38 ACI Clinical Networks, almost half of the survey responses were from five Networks (Aged Health, Rehabilitation, Rural Health, Blood and Marrow Transplant, and Pain Management) while 12 Networks had no responses. This is in part likely to be because the survey distribution was particularly targeted to 11 Networks, of which the top five responding Networks were included¹. This disproportionate spread should be taken into account when considering the survey data. Appendix G (in the *Appendices* companion document) details the number of survey responses by ACI Clinical Network.
- Consumers, carers and their families were not directly engaged with during the review. The
 online survey was distributed to ACI Clinical Network consumers and carers, but no responses
 were received from these groups. Information about consumer, carer and family experiences of
 telehealth-enabled models of care obtained through reviews conducted by LHDs and SHNs was
 sought during consultations, however very little of this type of information was available. Some
 information about consumers, carer and family experiences was provided second-hand by other
 consultation and survey participants (e.g. clinicians).

¹ The targeted ACI Clinical Networks were: Aged Health, Blood and Marrow Transplant Network, Burn Injury, Cardiology, Institute of Trauma Injury Management, Pain Management Network, Palliative Care, Rehabilitation, Rural Health, State Spinal Cord Injury Service and Stroke.

Appendix B Data collection plan

This appendix outlines the key lines of enquiry and associated research questions that guided Nous' data collection processes.

Key line of enquiry	Research questions	Desktop analysis	Survey	Case study interviews	Other stakeholder interviews
What is the profile of telehealth usage across the New South Wales (NSW) health system?	What is the range of applications across the NSW health sector (clinical and non-clinical)?				
	What is the coverage and level of uptake of telehealth-enabled models of care across LHDs and SHNs?				
	What differences exist in the level of maturity of use of telehealth in NSW?				
	To what extent and in which settings has telehealth been systematically integrated into models of care in NSW?				
	What have been the observed benefits from the use of telehealth in NSW?What evidence is there that telehealth has contributed to improved access, equity and quality of health services for people in NSW?				
	How does the profile of telehealth usage in NSW compare to other jurisdictions (nationally and internationally?)				
Where telehealth has been successfully embedded in models of care, what are the contextual factors that have contributed to this success?	What are key examples of good practice models in telehealth (in NSW and other Australian and international jurisdictions)?				
	 What are the characteristics of these models which contribute to success, specifically: Strategy: What are the strategic settings and organisational priorities which enable the model? 				

Key line of enquiry	Research questions	Desktop analysis	Survey	Case study interviews	Other stakeholder interviews
	 Governance: What are the governance arrangements which ensure appropriate oversight of the model? 				
	 Service delivery: How is telehealth integrated into the service delivery model? 				
	 Partnerships: What partnerships and alliances support the model? 				
	 Processes: What processes are needed to operationalise the model? 				
	 Workforce and culture: What capabilities and skills are required to deliver the model? What culture and behaviours support effective application of the model? 				
	 Organisation structure: What structure, roles and accountabilities support the model? What mechanisms facilitate coordinated and collaborative application of the model? 				
	 Physical assets and information management: What infrastructure, systems and technology are required to deliver the model? 				
	What have been the main benefits resulting from investment in and use of telehealth-enabled models of care?				
	• For patients				
	 For doctors, nurses and allied health staff 				
	 For health managers and administrators 				
	 For government 				
	To what extent has telehealth capability contributed to other clinical care outcomes, for example, clinical innovation?				

Key line of enquiry	Research questions	Desktop analysis	Survey	Case study interviews	Other stakeholder interviews
How has the successful embedding of telehealth in models of care contributed to non-clinical	How does telehealth capability support other elements of the health system? (e.g. training and education, management)				
elements of the health system?	What have been the main benefits of telehealth beyond clinical care outcomes?				
What are the key enablers and barriers to uptake and	What are the key factors influencing uptake of telehealth in NSW? (organisational, technological, capability, resourcing, geographical)				
effective use of telehealth?	What have been the key barriers and enablers to effective integration of telehealth into health service delivery in NSW? How do these vary by type of use and area of the health system?				
	How could key barriers to uptake and use of telehealth be addressed?				
	How could key enablers to uptake and use of telehealth be enhanced or leveraged?				
What state-wide settings are required to optimise and sustain the use of	What strategic framework is required to set priorities, actions, incentives and measures to drive telehealth uptake and application across the NSW Health system?				
telehealth in NSW?	What overarching infrastructure, clinical and performance issues will need to be addressed in a state-wide strategic framework for telehealth? (e.g. funding, referral pathways, equipment and systems, data and reporting, workforce)				
	How can telehealth be appropriately and successfully managed to prevent or overcome cross-border related issues?				

Key line of enquiry	Research questions	Desktop analysis	Survey	Case study interviews	Other stakeholder interviews
	How does this strategic framework align with existing telehealth initiatives and broader strategies and policy in NSW (e.g. eHealth Strategic Plan 2014- 2018, the Rural eHealth Program, The NSW State Health Plan, The Integrated Care Strategy 2014-2017)?				
	What governance framework will be required to support delivery of a telehealth strategy?				
	What are the respective roles and responsibilities of key NSW Health agencies to support the strategy?				
	What are the key risks for the use of telehealth-enabled models of care? How can these be mitigated?				

Appendix C Stakeholder engagement plan

This appendix provides an overview of the different engagement activities included in the review of telehealth in NSW.

Nous undertook a range of consultation activities as part of the review, including an online survey, case study consultations and individual interviews/small group discussions. The design of each consultation activity was tailored to the specific needs and circumstances of the stakeholder, and the purpose and desired outcome of the consultation activity. Nous:

- conducted between two and eight hours of focus groups/interviews for each of the seven case studies
- conducted 13 focus groups/interviews (typically of one hour's duration) with other key stakeholders
- utilised existing Ministry of Health (MOH) mechanisms and forums where possible
- conducted face-to-face interviews in metro areas where this suited stakeholders
- conducted interviews in other semi-rural, rural or remote areas by teleconference.

Consultation activities were underpinned by a series of core principles. These principles reflect best practice stakeholder consultation and were embedded in all components of the project consultation activities (including design, delivery, analysis and reporting). These core principles are:

Appropriateness – each consultation activity will have a clear aim, with consideration given to how outputs contribute to review findings. We will ensure the format and structure of activities are relevant and effective.

Integrity – we will ensure there is openness and honesty about the scope and purpose of each consultation activity. Consultations will balance the interests of all stakeholders fairly.

Equity – there will be an opportunity for all identified stakeholders to express their views by providing forward notice of engagement activities. The project will address barriers to engagement by considering cost and operational constraints.

Inclusion – the consultation process will provide an opportunity for a diverse range of opinions and perspectives to be freely expressed and heard.

Dignity – we will design, conduct and report consultation activities in a manner that respects the rights, privacy, dignity and entitlements of different stakeholder groups.

Informed – we will ensure both the NSW MOH Project Team are informed about the different consultation activities to ensure any ethical risks are considered prior to commencement.

Empowerment – the consultation process will be designed to ensure all stakeholders are informed about the outcomes from each engagement activity.

Coordinated – we will adopt a coordinated approach to the planning and delivery of consultation activities to ensure messages are consistent and not duplicated.

Communication – we will ensure stakeholder consultation activities deliver appropriate and targeted insights relevant to the review. We will also communicate with the NSW MOH Project Team about the different consultation activities so ethical risks are considered.

Table 1 overleaf details the purpose, timing and nature of engagement with all key stakeholders consulted during the review.

				Nat	ure of engagem	ent	Data request		
Stakeholders	Reason for engagement	Timing of engagement	Project operational meeting	Online survey	Case study consultations	Focus groups / Interviews	Data request		
Project governance									
 Project team Katherine McKernan, Project Sponsor – Associate Director, Strategic Policy Unit, Health System Planning and Investment Branch, NSW MOH Alina McDonald, Project Manager - Principal Policy Officer, Strategic Policy Unit, Health System Planning and Investment Branch, NSW MOH Freya Crawshaw – Policy Officer, Strategic Policy Unit, Health System Planning and Investment Branch, NSW MOH 	 Day-to-day operation of the project, regular fortnightly project progress updates, risk management, test findings and deliverables, endorse deliverables Assist with data request for existing telehealth documentation Assist with identifying and engaging stakeholders for consultations and online survey 	 Progress reporting during the weeks commencing 6/11/14, 28/11/14, 12/12/14, 19/1/15 and 3/3/15 On an as-needs basis for day-to-day operations 	✓						
Project Steering Group	 Identification of known successful models of telehealth Identification of existing documentation and data available to inform the review Consultation and advice on scoping paper, including sampling approach and proposed consultation approach for case studies and the online survey Provide feedback on the draft survey and focus group/interview questions Provide feedback on the draft final report 	 Three meetings over the life of the project, in the weeks commencing 3/11/14, 19/1/15 and 3/3/15 	V						

				Nat	ure of engagem	ient	
Stakeholders	Reason for engagement	Timing of engagement	Project operational meeting	Online survey	Case study consultations	Focus groups / Interviews	Data request
Other key stakeholders in NSW Health							
Elizabeth Develin, Director, Health System Planning and Investment Branch, NSW MOH	 Identify the elements of an effective implementation plan Identify the components of effective telehealth governance arrangements 	• 3/12/14				\checkmark	
 Other relevant NSW MOH branches with a policy or systems role regarding telehealth: Luke Worth, System Purchasing and Performance Division, NSW MOH Susan Burke, A/Associate Director, Integrated Care 	 Explore telehealth related KPIs that could be incorporated into LHD and SHN service agreements 	• 9/12/14				✓	
 eHealth NSW Mike Walsh, Chief Executive Officer (CEO) and Chief Clinical Information Officer John Lambert Chief Clinical Information Officer Craig Burke, Program Manager, Rural eHealth 	 Collect qualitative and quantitative information on the coverage, level of uptake and extent of integration of telehealth in the NSW health system, including barriers and enablers to its use Identify examples of good practice in telehealth and characteristics of successful models Explore how patient care could be enhanced through the use of telehealth Discuss state-wide settings required to optimise and sustain the use of telehealth (including strategic frameworks, infrastructure, and governance arrangements) Identify possible opportunities to align telehealth with other eHealth initiatives in NSW 	• 4/12/14				V	V

		Nature of engagement Timing of engagement Project operational meeting Online survey Case study consultations Focus groups / Interviews Data req					
Stakeholders	Reason for engagement	Timing of engagement	Project operational meeting	Online survey	Case study consultations	Focus groups / Interviews	Data request
 Agency for Clinical Innovation (ACI) Raj Verma, Director, Clinical Program Design and Implementation Jenny Preece, Rural Health Network Manager James Dunne, Program Manager, Clinical Redesign Project Implementation Julia Martinovich (Telehealth Implementation Project Officer) ACI Network Managers from the Stroke, Pain Management and Spinal Cord Injury Networks 	 Collect qualitative and quantitative information on the extent of integration of telehealth in the NSW health system, including barriers and enablers to its use Identification of examples of good practice in telehealth and characteristics of successful models Explore how patient care could be enhanced through the use of telehealth Discuss state-wide settings required to optimise and sustain the use of telehealth (including strategic frameworks, infrastructure, and governance arrangements) 	• 5/12/14				✓	
Other NSW Health Pillar Agencies: • NSW Kids and Families • Cancer Institute NSW	 Collect qualitative and quantitative information on the coverage, level of uptake and extent of integration of telehealth in the NSW health system, including barriers and enablers to its use Identification of examples of good practice in telehealth and characteristics of successful models Explore how patient care could be enhanced through the use of telehealth Discuss state-wide settings required to optimise and sustain the use of telehealth (including strategic frameworks, infrastructure, and governance arrangements) 	• 13/1/15				•	

		Nature of engagement			ient		
Stakeholders	Reason for engagement	Timing of engagement	Project operational meeting	Online survey	Case study consultations	Focus groups / Interviews	Data request
Other relevant NSW Health organisations identified by the Project Team or Steering Group: • Royal Flying Doctor Service		• 13/1/15				V	
Local Health District (LHD) and Specialty Hea	ith Network (SHN) stakeholders						
 Clinicians and other health workers in LHDs and SHNs who use telehealth (nominated by the LHD and SHN) Note: case study sites will comprise the following LHDs and SHNs: Hunter New England LHD (HNELHD), Murrumbidgee LHD (MLHD), Nepean Blue Mountains LHD (NBMLHD), Northern Sydney LHD (NSLHD), Sydney LHD (SLHD), Far West LHD (FWLHD) and Sydney Children's Hospital Network (SCHN) 	 Collect qualitative and quantitative information on the coverage, level of uptake and extent of integration of telehealth in the health system, including barriers and enablers to its use Determine the effect on quality of care that is delivered through the use of telehealth Identify and explore examples of good practice models in telehealth Identify specific benefits to clinicians and health workers Explore how patient care could be enhanced through the use of telehealth 	 Survey: two week period from 27/11/14 to 12/12/14 Interviews: 1/12/14 to 6/2/15 		V	V		

				Nat	ure of engagem	ient	
Stakeholders	Reason for engagement	Timing of engagement	Project operational meeting	Online survey	Case study consultations	Focus groups / Interviews	Data request
 Health managers and administrators, operational and technical staff in LHDs and SHNs who use or work with telehealth, Medicare Local representatives and nongovernmental organisations (NGOs) Note: case study sites will comprise the following LHDs and SHNs: HNELHD, MLHD, NBMLHD, NSLHD, SLHD, FWLHD and SCHN 	 Collect qualitative and quantitative information on the coverage, level of uptake and extent of integration of telehealth in the health system, including barriers and enablers to its use Identify and explore examples of good practice models in telehealth Identify non-clinical benefits of telehealth Identify any other specific benefits to health managers and administrators, operational and technical staff Explore how patient care could be enhanced through the use of telehealth 	 Survey: two week period from 27/11/14 to 12/12/14 Interviews: 1/12/14 to 6/2/15 		✓	✓		
LHD and SHN Telehealth Managers and Coordinators	 Explore identified good practice models of telehealth, including elements of success, benefits and other outcomes (particularly any non-clinical outcomes) Discuss state-wide settings required to optimise and sustain the use of telehealth (including strategic frameworks, infrastructure, and governance arrangements) Discuss non-clinical benefits of telehealth Explore how patient care could be enhanced through the use of telehealth 	 25/11/14 through the pre-existing State-wide Telehealth Managers Forum 				V	

				Nat	ure of engagem	nent Focus groups / Interviews Data reques				
Stakeholders	Reason for engagement	Timing of engagement	Project operational meeting	Online survey	Case study consultations	Focus groups / Interviews	Data request			
LHD and SHN Information and Communication Technology (ICT) and Systems Managers	 Explore identified good practice models of telehealth, including elements of success, benefits and other outcomes (particularly any non-clinical outcomes) Discuss state-wide settings required to optimise and sustain the use of telehealth (including strategic frameworks, infrastructure, and governance arrangements) Discuss non-clinical benefits of telehealth Explore how patient care could be enhanced through the use of telehealth 	• 17/12/14 through the pre-existing ICT and Systems Executive Committee meeting				V				
Rural LHD Chief Executives	 Explore identified good practice models of telehealth, including elements of success, benefits and other outcomes (particularly any non-clinical outcomes) Discuss state-wide settings required to optimise and sustain the use of telehealth (including strategic frameworks, infrastructure, and governance arrangements) Discuss non-clinical benefits of telehealth Explore how patient care could be enhanced through the use of telehealth 	 11/12/14 through the pre-existing Rural Chief Executive forum 				•				

				Nat	ure of engagem	ent	ups ws Data request			
Stakeholders	Reason for engagement	Timing of engagement	Project operational meeting	Online survey	Case study consultations	Focus groups / Interviews	Data request			
Metropolitan LHD and SHN Chief Executives (of case study LHDs and SHNs only)	 Explore identified good practice models of telehealth, including elements of success, benefits and other outcomes (particularly any non-clinical outcomes) Discuss state-wide settings required to optimise and sustain the use of telehealth (including strategic frameworks, infrastructure, and governance arrangements) Discuss non-clinical benefits of telehealth Explore how patient care could be enhanced through the use of telehealth 	• Interviews: 1/12/14 to 6/2/15				V				
Patients										
Patients who have received care enabled by telehealth technologies	 Obtain information about patient satisfaction and their experience with telehealth services via case study LHDs and SHNs and the ACI Consumer Representative Group 						V			
Other Australian jurisdictions identified as g	ood practice telehealth jurisdictions			1						
Western Australia (WA)	• Explore how telehealth is being used in	• 13/1/15				\checkmark				
Queensland (QLD)	and what challenges have been experienced (and how these have been	• 22/1/15				\checkmark				
Victoria	 Discuss the state's state-wide governance framework for telehealth 	• 23/12/14				\checkmark				

Appendix D Scoping paper

The contents of this appendix have been drawn from the *Strategic review of telehealth in NSW: Scoping paper* dated 19 November 2014. Note that some elements of the review ultimately differed from the original approach outlined in this scoping paper as the approach was evolved to meet changing review requirements (e.g. Northern Sydney LHD replaced South Western Sydney LHD as a case study site, the final list of stakeholders consulted).

D.1 Background and purpose

D.1.1 Background

Telehealth services across NSW have developed iteratively since the NSW Telehealth Program commenced in the mid-1990s. This has resulted in differences in the maturity of telehealth-enabled models of care across LHDs and SHNs. In NSW Health settings, there is a broad spectrum of maturity, uptake and integration of telehealth services into standard practice.

NSW Health is interested in gaining a better understanding of the current state of telehealth across the NSW health system and how telehealth can be embedded into core business. This will help to identify how telehealth infrastructure and models of care can be optimised to achieve the organisational goals of the health system (that is, high quality and patient-centred care).

D.1.2 Purpose of the review

The NSW MOH commissioned Nous Group (Nous) to undertake a review of telehealth that will provide an assessment of the current state of telehealth in NSW and recommendations for future strategic direction and oversight. Whilst telehealth is being used for both clinical and non-clinical uses across NSW, this review will focus on issues relating to the clinical application of telehealth.

More specifically, the review will provide:

- a description of the coverage, level of uptake and extent of integration of telehealth, as well as enablers and barriers to uptake
- an environmental scan for models of good practice in telehealth, including in NSW, nationally and internationally
- a description of successful models of telehealth in NSW, particularly the characteristics required to maximise the benefit of telehealth in achieving organisational goals
- identification of state-wide system levers, drivers, incentives and strategic frameworks needed to embed successful models of telehealth in a wide range of settings
- identification of the infrastructure, clinical and performance issues that require consideration in the current policy context
- identification of opportunities to align ongoing telehealth work with other key initiatives (such as the eHealth Strategic Plan 2014-2018)
- recommendations for future oversight of funding, implementation and strategic direction for telehealth in NSW, presented in a high level implementation plan.

D.1.3 Purpose of the scoping paper

This scoping paper is the first deliverable of the review. It comprises:

- an outline of the sampling strategy for the online survey and all consultations
- a description of the proposed LHDs and SHN selected for the case studies
- proposed participants for other stakeholder consultations
- a description of the approach for capturing best practice examples of telehealth-enabled models of care.

D.2 Sampling strategy for online survey and consultations

Nous will utilise a sampling approach for the online survey and the consultations that ensures we are able to draw meaningful and representative insights from the data. This sampling approach has been developed in consultation with the Project Steering Group.

D.2.1 The online survey will be disseminated to key contacts in each LHD for further distribution

Purpose and content of online survey

The aim of the online survey is to gain a deeper understanding of the broad spectrum of telehealth models in operation in NSW.

The survey questions will be informed by the agreed data collection and stakeholder engagement plans. The survey will comprise mainly close-ended questions (including rating scales such as a Likert scale, ranking scales and multiple choice) and minimal free text questions.

The survey will also collect basic demographic data from respondents, including the LHD and SHN, ACI clinical network (if applicable) and type of health care facility respondents predominantly work in and their current role. This demographic information will be important to attribute thematic results to particular groups of respondents. All responses will be de-identified and not attributable to individuals in any deliverables.

A draft set of survey questions will be distributed to the Project Steering Group for comment prior to being finalised.

The content of the survey will focus on the following within the NSW health system:

- coverage of telehealth-enabled models of care
- level of uptake and extent of integration of telehealth
- barriers and enablers to telehealth usage, including how barriers could be addressed and enablers leveraged
- benefits and limitations of telehealth models
- good practice examples of telehealth in NSW.

To maximise the response rate, we will ensure the survey takes no longer than 10-15 minutes to complete. The insights gained from analysis of the survey responses will be used to inform the overall findings and recommendations that will be detailed in the final report.

Approach to dissemination of the online survey

Our experience with similar projects has shown that employing a 'waterfall' approach is an effective mechanism for reaching a large number of relevant participants across all LHDs and SHNs (illustrated in Figure 4. The survey will be distributed to clinicians, managers, consumers and carers who are a part of ACI Clinical Networks. We propose to distribute the online survey to key contacts (identified by the LHD and SHN Chief Executives) in each of the LHDs and SHNs. These key contacts will be best placed to identify appropriate staff to further disseminate the survey to. We anticipate the survey will first be forwarded to clinical stream leads, who will in turn distribute the survey to relevant doctors, nurses, allied health practitioners, other health workers, telehealth coordinators or managers and administrative staff.

ACI will also distribute the online survey to a range of Clinical Networks, including those that are early adopters of telehealth and those that are considering telehealth as a delivery strategy. The survey will be distributed to clinicians, managers, consumers and carers who are a part of ACI Clinical Networks.



Figure 4: Approach to distribution of online survey

By employing this approach to survey distribution, the survey should reach:

- facilities and users whose experience with telehealth varies, from those that are early adopters of telehealth to those that are still considering telehealth as a delivery strategy
- a range of health care facility types (e.g. rural and metro, large tertiary facilities and primary care facilities)
- a range of treatment types (e.g. diagnosis, treatment, acute and chronic care)
- a range of clinical specialties (e.g. primary and specialist care)

- a range of telemedicine or telehealth uses (e.g. clinical including store-and-forward, remote monitoring, real-time services; non-clinical)
- a range of telehealth technologies (e.g. videoconference, apps).

D.2.2 We used key criteria to select appropriate case studies

Purpose and content of case study consultations

The aim of the case study consultations is to explore identified good practice models of telehealth, including elements of success, benefits and other outcomes.

The case study consultation questions will be informed by the agreed data collection and stakeholder engagement plans. They will also be guided by Nous' well-tested organisational architecture pyramid framework provided in Figure 5. This framework will ensure our consultations distil the specific components of both the NSW Health system and local health facilities that are enabling or hindering the success of telehealth models of care (e.g. from how services are being delivered to operational factors such as workforce and culture).





Approach to selecting appropriate case studies

Nous selected a diverse and representative sample of LHDs and SHNs for the case study sites. Sites were selected based on:

- location (rural, outer metro and inner metro LHDs)
- areas of good practice and areas where telehealth is currently less well utilised or integrated.

Seven proposed sites were agreed with the Project Steering Group. These sites are listed below and illustrated (in orange) in Figure 6.

- Hunter New England LHD
- Murrumbidgee LHD
- Nepean Blue Mountains LHD
- South Western Sydney LHD
- Sydney LHD
- Western NSW LHD
- Sydney Children's Hospital Network.





We have developed a set of criteria we will use to select a specific telehealth model within each of these LHDs and SHN. We will aim to select models that demonstrate variety across each of the following criteria:

- health care setting (type of facility)
- type of medicine
- nature of care provided (e.g. diagnosis, referral, treatment)
- type of telehealth uses with a focus on clinical uses (e.g. clinical including store-and-forward, remote monitoring, real-time services)
- level of integration into local service delivery (e.g. presence of data collection activities and KPIs).

The case study consultations will be undertaken with a structured sample of clinicians, other health workers, administrators, telehealth managers and coordinators, Medicare Local representatives and relevant NGOs. Where available, we will draw on any information held by the LHDs or SHN about patient experience and outcome with or experience of the telehealth models.

D.2.3 We have identified a range of other key stakeholders to consult

We will consult with a range of other key stakeholders to further understand the characteristics of successful models of telehealth, barriers and enablers to uptake, state-wide settings to optimise its use and possible opportunities to align with other eHealth initiatives. These stakeholders have been agreed with the Project Steering Group.

The other key stakeholders we plan to consult with are detailed in Table 2.

Stakeholder organisation/group	Proposed stakeholder for consultation
Health System Planning and Investment Branch, NSW MOH	Elizabeth Develin, Director
Other NSW MOH branches with a policy or systems role regarding telehealth	 System Purchasing and Performance Division, NSW MOH Systems Relationships and Frameworks Branch Workforce Planning and Development Activity Based Funding Taskforce Integrated Care Government Relations
eHealth NSW	 Mike Walsh, CEO and Chief Clinical Information Officer John Lambert, Chief Clinical Information Officer Craig Burke, Program Manager, Rural eHealth
ACI	 Raj Verma, Director, Clinical Program Design and Implementation Jenny Preece, Rural Health Network Manager James Dunne, Program Manager, Clinical Redesign Project Implementation Julia Martinovich, Rural Health Manager Group of Clinical Network Managers

Table 2: Other stakeholder consultation participants

Stakeholder organisation/group	Proposed stakeholder for consultation
NSW Health Pillar Agencies	 Cancer Institute NSW NSW Kids and Families Clinical Excellence Commission
Royal Flying Doctor Service	твс
NSW Ambulance	твс
LHD Chief Executives	Rural LHD Chief ExecutivesMetropolitan LHD Chief Executives
LHD telehealth managers and coordinators	To be consulted through the State-wide Telehealth Managers Forum
LHD Chief Information Officers	To be consulted through the ICT Systems and Executive Committee Meeting

D.3 Approach to capturing good practice examples in consultations

Nous is skilled in conducting focused and effective stakeholder consultations. We will employ a number of techniques to ensure our consultations successfully capture characteristics of good practice models of telehealth, which include:

- designing targeted questions which we will use for all consultations to ensure a consistent approach to drawing out information about the examples of good practice telehealth models
- using our existing knowledge of characteristics of good practice models of care to prompt interviewees to think about examples of good practice in their jurisdictions
- capturing the insights from each consultation in a consistent structure to ensure that we can efficiently identify key themes and messages related to good practice models.

Appendix E Documents provided by the NSW Ministry of Health

The following documents were provided by the NSW Ministry of Health and were reviewed as part of the data collection process:

- Agency for Clinical Innovation, 2014. *Telehealth resources (Telehealth Resource Package)*. [Online] Available at: <u>http://www.aci.health.nsw.gov.au/resources/telehealth</u> [Accessed 20 October 2014]
- Curran, K. & Kennedy, C., 2008. Strategic review of telehealth in NSW Health, s.l.: Queensland Health
- Deloitte, 2013. *National eHealth strategy refresh and business case development,* s.l.: Deloitte Touche Tohmatsu
- Department of Health, 2013. Supporting the implementation of telehealth in Victoria: the Victorian Government's response to the recommendations of the Health Innovation and Reform Council, Melbourne: Department of Health
- Health and Community Services Committee, 2014. *Report No. 55: Inquiry into telehealth services in Queensland,* s.l.: Parliamentary Committees
- Hunter New England Area Health Service, 2010. *HNE Health Telehealth Clinical Strategy 2010-2014*, s.l.: NSW Health
- Kennedy, C., 2005. Review of NSW Telehealth Initiative, s.l.: Queensland Health
- NSW Ministry of Health, 2013. A Blueprint for eHealth in NSW, Chatswood: HealthShare NSW
- NSW Ministry of Health, 2014. *Corporate Plan: eHealth NSW 2014-2017*, Sydney: NSW Ministry of Health
- NSW Ministry of Health, 2014. *NSW State Health Plan: Towards 2021,* Sydney: NSW Ministry of Health
- NSW Ministry of Health, n.d. *Telehealth in NSW: Planning for the future* (Agenda item, eHealth Executive Council), s.l.: NSW Ministry of Health.
- Reedy, W. & Young, A., 2014. *Rural LHDs eHealth Vision, Strategy and Plan,* s.l.: Healthshare NSW

Appendix F Summary of demographic information of survey respondents

This appendix contains key demographic details of those who responded to the online survey that was conducted to better understand the coverage and level of uptake of telehealth in NSW, and the barriers and enablers to its use. The survey was administered over a two week period from 27 November to 12 December 2014.

Response numbers vary by question as questions were not mandatory, meaning that respondents could opt to skip questions. With respect to a number of graphs in this appendix, 'n' refers to the total number of respondents to a question and 'x' refers to the number of respondents who selected a particular response option.







Figure 8: Survey respondents by current role in the NSW Health system (n=486)

Note: The 'Other' category includes a range of other positions such as midwives, pathologists, research positions, information technology (IT) managers and support workers and nurse educators.



Figure 9: Proportion of survey respondents who indicated they work for a LHD or SHN (n=482)

Yes ■ No



Figure 10: Survey respondents who indicated they are part of an ACI clinical network (n=486)

Figure 11: Type of health care facilities survey respondents indicated they work in (n=483)
■ Majority public ■ Majority private ■ Equally both public and private ■ Not applicable





Figure 12: Location of health care facility survey respondents indicated they work in (n=483)

Figure 13: Type of health care facility survey respondents indicated they predominantly worked (n=482)



Type of health care facility

Appendix G Selected additional survey data

This appendix contains some selected additional survey analyses, which is informed by the online survey that was conducted as part of Nous' data collection process. Response numbers vary by question as questions were not mandatory, meaning that respondents could opt to skip questions. With respect to a number of graphs in this appendix, 'n' refers to the total number of respondents to a question and 'x' refers to the number of respondents who selected a particular response option.

Figure 14: Survey respondents who agreed or strongly agreed telehealth services are used for a broad range of purposes in their workplace (n=144)



Note: some LHDs appear to have a relatively high percentage of respondents who agree or disagree telehealth services are used for a broad range of purposes in their workplace, however it should be noted that the total number of respondents for some LHDs is relatively small (as shown in Figure 15).





Figure 16: Type of health specialty for which survey respondents indicated they support, manage or coordinate telehealth services (n=86)

Type of health specialty

Note: The 'Other' category includes drug and alcohol, endocrine, infectious diseases, respiratory and rheumatology services. Additionally, the total number of responses to this question was relatively low compared to the total number of survey respondents, and the pattern of responses may have been influenced by the distribution of the survey to a limited number of specifically selected ACI Clinical Networks (reflected in Figure 17).



Figure 17: Survey responses by ACI Clinical Network(n=78)



Figure 18: Type of non-clinical services for which survey respondents indicated they use, support, coordinate or manage telehealth (n=270)

Note: the 'Other' category of non-clinical uses primarily included interviewing for recruitment purposes.



Figure 19: Benefits for patients due to the use of telehealth identified by survey respondents (n=359)

Figure 20: Benefits for health care workers due to the use of telehealth identified by survey respondents (n=359)



Benefit

Appendix H Telehealth services in NSW

This appendix describes a number of telehealth-enabled services that are in operation across NSW and is not intended to be an exhaustive catalogue of services. It has been informed by the literature and consultations with stakeholders.

Clinical specialty	Example telehealth services within NSW
Aged care	 Concord Hospital provides geriatric services to a number of sites in WNSWLHD and FWLHD (see Appendix A in the <i>Final Report</i> for more detail). The NSW Rural Doctors Network (RDN) links geriatric psychiatry specialists with patients and health professionals in outreach locations for telehealth consultations via videoconference (NSW Rural Doctors Network, 2014).
Burns care	 The NSW Severe Burn Injury Service had a telehealth network that comprised 160 health facilities including public hospitals, community health centres, Aboriginal Medical Services (AMS), Correctional Health Centres and the Mental Health Tribunal. The NSW Burn Injury Telehealth Medicine for Rural and Remote Services Program was established and funded through the NSW Telehealth Initiative Program (the date of establishment is unknown). The Burn Unit at Concord Hospital managed the project. No information was (readily) available on when the service commenced, whether it is still in operation or the number of patients it provided care to. In 2011, ACI reported that email consultation services were set up at three acute Burn Units to support the early assessment, management and ongoing post-acute care of burn injured patients (NSW Statewide Burn Injury Service Multidisciplinary Clinical Team, 2011).
Chronic disease	 A program managed by Integrated Living and New England Medicare Local, Staying Strong, is focused on chronic disease management for persons identifying as Aboriginal and Torres Strait Islander aged 50 years or over. It uses telehealth monitoring that is performed at home or via community telehealth hubs. Benefits of the program include reduced emergency hospitalisations, more accurate and timely diagnosis, increased independence and self-management and reduced need for general practitioner (GP) home visits (Tunstall Healthcare, 2013).
Critical care / emergency care	 The Connecting Critical Care project in the MLHD aims to enhance local critical care services using audio-visual technology. An initial trial of six telehealth cameras in rural hospital emergency departments is currently underway, while the LHD develops, implements and evaluates a locally tailored telehealth solution. Telehealth-enabled sites include Orange, Dubbo, Bathurst, Mudgee, Tamworth, Moree, Aeromedical and Medical Retrieval services, Royal Prince Alfred Hospital (RPAH) and Royal North Shore Hospitals (Murrumbidgee Local Health District, 2013; Queensland Health, 2008). The Virtual Critical Care Unit is an example of tele-critical care that used in emergency departments. The units were developed by CSIRO in collaboration with NSW Health and staff at Katoomba Hospital. They facilitate real time interaction between a resuscitation team and a remote specialist via a broadband connection (Gray, et al., 2011). MLHD has launched a project to enhance local critical care services using audio-visual telehealth technology (Murrumbidgee Local Health District, 2013).

Clinical specialty	Example telehealth services within NSW
Diabetes	 The Royal Prince Alfred Hospital (RPAH) provides assessment and advice for diabetes foot ulcers. A store-and-forward telemedicine service is provided when there are critical signs of infection, wound stagnation or a second opinion is required. The service is well-developed and has standardised protocols (Queensland Health, 2008; Devine, 2009). The YOuR Diabetes Project runs a telehealth clinic designed to provide specialist support for young adults with Type 1 Diabetes living in rural areas. It is run through a partnership between the University of Newcastle, HNELHD, and the Australian Diabetes Council (New England Medicare Local, n.d.). Telemedicine Australia is working to enhance care for patients with diabetes by linking general practitioners with an endocrinologist in Sydney. The local of general practitioners participating in this program is not known. The project has achieved more than an 80 per cent success rate in terms of getting diabetic patients glucose levels under control (Health and Ageing Australia, 2014).
Educational activities	 Educational activities using telehealth have included: training on smoking cessation advice, preventing falls in older people and refugee health training to enhance service delivery (Queensland Health, 2008; Hackett, et al., 2010). In 2010, 70% of clinical telehealth in HNELHD was focused on staff education, training and workforce support (e.g. case reviews) (Hunter New England Area Health Service, 2010). The Allied Health Telehealth Program began in 2003 in the then Greater Eastern and Southern Child Health Network. Since then, it has provided paediatric education and support to over 6,000 allied health staff to enhance paediatric care. The program provides education activities and workshops via videoconference to various sites across NSW (NSW Government, 2014). 'Bug Breakfast' was a series of video-conference enabled seminars on communicable diseases provided to approximately ten remote sites across NSW in 1999. It is recognised as a highly successful activity (Queensland Health, 2008).
Epilepsy	 The State-wide Complex Epilepsy Network (SCES) uses videoconferencing technology to link clinicians from a number of hospitals to discuss and review treatment and outcomes for patients with complex epilepsy (Minister for Health, 2012). SCES networks across the SCHN (Randwick and Children's Hospital Westmead (CHW)), the RPAH, Prince of Wales Hospital and Westmead Hospital. During 2010-11, a collaboration with Australia's Academic and research Network and investment from NSW Health enhances clinical meetings across the sites using high quality video electroencephalography data in real time (NSW Health, 2011).
Genetic counselling	• Counselling has been provided using telehealth between Tamworth and Newcastle in the HNELHD. Telehealth has been used to provide appointments, rather than waiting for a counselling service to visit Tamworth. The service also reached Broken Hill and Dubbo in the (former) Greater Western Area Health Service (AHS), as well as the (former) North Coast AHS (Hunter New England Area Health Service, 2010; Queensland Health, 2008).
Gynaecology	 Hunter New England Centre for Gynaecological Cancer provides a service for women with or suspected of having a gynaecological malignancy. The Centre uses videoconferencing for women in Tamworth and Coffs Harbour to save them from travelling for new patient consultations. Feedback from the first 30 patients who used the service was positive and benefits included reduced anxiety, distress, financial burden and travel (Cancer Institute NSW, 2014).

Clinical specialty	Example telehealth services within NSW
Mental health	 The Mental Health Emergency Consultation Service (MHECS) operates out of Wagga Wagga and Albury Hospitals in MLHD and provides emergency specialist mental health services to patients across the LHD (see Appendix A in the <i>Final Report</i> for more detail).
	 The Mental Health Emergency Care–Rural Access Project (MHEC-RAP) encompasses a network of videoconferencing facilities based in emergency departments. A central team of nurses and psychiatrists provide 24 hour consultation to rural hospital emergency departments across Western NSW LHD (WNSWLHD). The service is well established. It has achieved acceptable levels of service activity and continues to be as used as intended. There were 55,959 calls to the MHEC-RAP, of which 17% initiated ongoing service (Australian Resource Centre for Healthcare Innovations, 2014; Saurman, et al., 2011; Saurman, et al., 2014).
	 Southern NSW LHD (SNSWLHD) is using telehealth consultations provided by its Medical Health Emergency Support Centres to support an integrated model of mental health care for acute and primary health care services. In 2011, it comprised 57 telehealth units (Gray, et al., 2011). One action of the SNSWLHD Strategic Plan 2013-16 is to expand the service to provide 24/7 support to non- specialist hospitals (Southern NSW Local Health District, 2013).
	• As part of the NSW RDN Medical Specialists Outreach Assistance Program (MSOAP) Telehealth Trial psychiatrists were linked with patients and health professionals in rural and remote locations. The service used largely existing LHD infrastructure and videoconferencing. As of 2014, 50 patient telehealth consultations have been conducted (across all the specialities in the trial) (NSW Rural Doctors Network, 2014).
	 In 2003, rural NSW child health specialists were linked to the CHW as part of a telepsychiatry outreach service. More than 27 sites were linked across the state (Starling, et al., 2003). More recent data on this program was not publicly available.
Oncology	 Medical oncology services are provided across FWLHD by a specialist at Royal Adelaide Hospital (see Appendix A in the <i>Final Report</i> for more detail).
	 As part of the NSW RDN MSOAP Telehealth Trial specialists (in medical and radiation oncology) were linked with patients and health professionals in rural and remote locations. The service used largely existing LHD infrastructure and videoconferencing. As of 2014, 50 patient telehealth consultations have been conducted across all the specialities in the trial (NSW Rural Doctors Network, 2014).
Ophthalmology	• A specialist ophthalmology service has been provided from the Prince of Wales Hospital to outback NSW (Minister for Health, 2012). The results of eye scans done in rural and remote NSW can be immediately reviewed and explained to patients while in a videoconference session with clinicians at Prince of Wales Hospital.
Outpatient services	 The Hospital in the Home Program operates out of Nepean Blue Mountains Hospital and provides post-discharge care to patients across the NBMLHD (see Appendix A in the Final Report for more detail). John Hunter Hospital in Newcastle provides a range of outpatient services using telehealth (see
	Appendix A in the <i>Final Report</i> for more detail).

Clinical specialty	Example telehealth services within NSW
Paediatrics	 The SCHN provides paediatric diabetes services across NSW using telehealth (see Appendix A in the Final Report for more detail).
	 In 2011, the Child and Adolescent Psychological Telemedicine Outreach Service was providing telepsychiatry to children and young people across NSW (NSW Ministry of Health, 2011). It is not known whether this service is still active.
	 As part of the NSW RDN MSOAP Telehealth Trial developmental paediatrics specialists were linked with patients and health professionals in rural and remote locations. The service used largely existing LHD infrastructure and videoconferencing. As of 2014, 50 patient telehealth consultations have been conducted (across all the specialities in the trial) (NSW Rural Doctors Network, 2014).
	 Newborn and Paediatric Emergency Transport (NETS) service provides emergency care to seriously ill children. The initiative is in partnership with Variety – The Children's Charity. It involves a videoconferencing system installed at the NETS headquarters at Westmead being used to allow NETS clinicians to assess a child in another hospital and provide support for local clinicians. NETS clinicians have reported that the addition of vision to their previously well-established telephone support service has assisted them in making better informed decisions about patient care (Minister for Health, 2012).
Pain Management	 Greenwich Hospital provides pain management for patients with spinal cord injury across NSW (see Appendix A in the <i>Final Report</i> for more detail).
	 The Illawarra Pain Management Service has provided a telehealth pain management service that supports the transfer of skills to rural area clinicians (Queensland Health, 2008).
Palliative care	• Two home telehealth technologies (the Intel Health Guide and the Apple iPad) were trialled by four clinical services in the HNELHD for paediatric palliative care, stroke and brain injury rehabilitation. The telehealth devices were loaned to 102 patients for on average three months. Forty-two clinicians were involved in the trial. The use of telehealth technology was positively received by clinicians, management and patients (Katalinic, et al., 2013).
	 As part of the NSW RDN MSOAP Telehealth Trial palliative care specialists were linked with patients and health professionals in rural and remote locations. The service used largely existing LHD infrastructure and videoconferencing. As of 2014, 50 patient telehealth consultations have been conducted (across all the specialities in the trial) (NSW Rural Doctors Network, 2014).
Renal	• A state-wide renal telehealth project has provided support from the RPAH to staff in rural areas for case conferences and education activities (Queensland Health, 2008).
Surgical procedures	 Tamworth Hospital has used videoconferencing to determine the feasibility and accuracy of an assessment of abnormal cervical cytology (Queensland Health, 2008).

Appendix I Telehealth usage nationally and internationally

This appendix provides a description of overall telehealth usage in jurisdictions in Australia other than NSW and selected international jurisdictions (Canada, New Zealand, Norway, and the United Kingdom).

I.1 Australian jurisdictions (excluding NSW)

Queensland



QLD has been using telehealth for more than two decades and is often considered a leader in the field (Armfield, et al., 2014). Telehealth services are well-established, well-integrated state-wide and available across a wide range of clinical specialities (Health and

Community Services Committee, 2014). Stakeholders in Queensland stated telehealth has become a priority for the state and there has been considerable investment in infrastructure (particularly a videoconferencing network) to enable telehealth (Health and Community Services Committee, 2014). Stakeholders reported \$30.9 million over four years has been committed to improving and expanding telehealth usage in Queensland (commencing in 2013-14).

Telehealth services are centrally coordinated through Queensland Health and the Centre for Online Health (COH) at the University of Queensland (Armfield, et al., 2014; Gray, et al., 2011; DSTC for Centre of Military and Veteran's Health, 2005). Telehealth is mainly used in public hospitals, community health centres, Aboriginal medical services and the offices of the Royal Flying Doctor Service (where 20% of all services are delivered through telehealth) (Gray, et al., 2011). Stakeholders reported that more recently there has been a push around how to use telehealth to address links between GPs and specialists to support continuity of care. They also stated there has been a focus on both non-admitted and admitted services, with telehealth uptake more successful in relation to non-admitted episodes of care (a 30-40% increase per year over the past couple of years).

Stakeholders reported Queensland Health manages over 2000 telehealth systems across QLD, including 656 videoconferencing systems which are mainly used for clinical activity (Armfield, et al., 2014).

Four types of clinics account for 84 per cent of admitted patient telehealth events: intensive care, rehabilitation, geriatric and general medical/surgical (Health and Community Services Committee, 2014). Some specific examples of telehealth services in Queensland include:

- a multidisciplinary paediatric service linking Brisbane with 82 regional sites
- emergency care linking Townsville and Brisbane
- ear, nose and throat outpatient sessions to remote areas
- tele-radiology and remote intensive care unit monitoring for Mt Isa from Townsville
- telegeriatrics from Caloundra to Maryborough.

Telehealth services are also available for anaesthetics, burns, cardiac, cardiology, dermatology, diabetes, endocrinology, gastroenterology, general medicine, genetics, haematology, hepatology, midwifery, nephrology, neurology, nutrition, obstetrics, occupational therapy, oncology, orthopaedic surgery, paediatric medicine, primary care, psychiatry, respiratory, rheumatology, speech pathology and others. (Gray, et al., 2011; Health and Community Services Committee, 2014; Sabesan, et al., 2012).
Recently there have been reports that some services (videoconferencing) are being severely underutilised (Armfield, et al., 2014).

A parliamentary inquiry into telehealth services in Queensland was published in 2014. The review identified specific barriers and enablers to uptake of telehealth in QLD, as well as the governance arrangements and state-wide settings that have enabled the expansion of telehealth services.

Examples of selected telehealth services

- Townsville Cancer Centre: further detail can be found in section 4.2.1.2 in the *Final Report* and in Appendix J.
- The COH at the University of Queensland and Royal Children's Hospital, Brisbane have developed a centralised paediatric referral centre that is available to 82 regional sites throughout Queensland and Northern NSW. The multidisciplinary service commenced in 2000 and provides expert collaboration in diabetes, endocrinology, burns, cardiology, dermatology, oncology, orthopaedics, gastroenterology, neurology and paediatric surgery. Between 2000 and 2010, over 11,000 tele consultations were undertaken. Approximately 90% of all tele paediatric referrals result in a consultation via videoconferencing.
- Telehealth trial sites for diagnosing hearing problems in newborns have been set up at Hervey Bay and Mackay (Queensland Health, 2013).
- The paediatric burns centre in Brisbane conducted care of paediatric patients across Queensland using teleconferencing facilities (DSTC for Centre of Military and Veteran's Health, 2005).



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Western Australia

Telehealth is broadly used across the state and encompasses a range of applications and specialities. Telehealth services in WA have been underway in various forms for around 15 years, supported by injections of federal and state funding. The funding was generally focused on technology and infrastructure development. More recently, the

WA Department of Health identified that investment was needed in more than just infrastructure, and invested in human resources for the first time (two years ago).

Telehealth services in WA are managed through individual hospitals, although the WA Country Health Service plays a role in leading and promoting the use of telehealth across the state (Gray, et al., 2011; Department of Health (WA), 2011). The use of telehealth is relatively widespread across health care facilities, generally from metropolitan areas to rural sites (Department of Health (WA), 2011). There is an extensive network of video-conferencing facilities. Telehealth is used for across a range of specialities including wound care, radiology, chronic disease care, emergency care, outpatient care, and psychiatry services (Department of Health (WA), 2011; Bahaadinbeigy, et al., 2010). It is also used for educational purposes.

WA's telepsychiatry and teleradiology programs are particularly well-established (Gray, et al., 2011). A 2010 survey of 102 health care facilities in WA found that around 73% were using telehealth, and it was more commonly used in public hospitals (85%) than private (24%) (Bahaadinbeigy, et al., 2010).

WA stakeholders identified the Ontario Telemedicine Network (OTN) as a best practice example of how to manage and facilitate state-wide telehealth services. Implementation of a similar non-governmental model was planned for WA, but was delayed and the subject to review. The review recommended still moving to the model (pending other preparatory work).

Examples of selected telehealth services

- Emergency telehealth Service: further detail can be found in section 4.2.1.2 in the *Final Report* and in Appendix J.
- The Aboriginal remote telehealth program used telehealth for remote monitoring of Indigenous patients with chronic diseases in remote parts of WA. Benefits included reduced hospital use and easier access to ongoing health care monitoring (Medical Technology Association of Australia, 2012).



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Victoria

Telehealth in Victoria is at an earlier stage than some other states in its provision of telehealth on a state-wide scale (McDonald, 2014a). Telehealth is currently managed through the five regional 'Rural Health Alliances' (RHA) (Health and Community Services

Committee, 2014). The most established is the Grampians RHA, which consists of 40 sites across Western Victoria.

Historically, telehealth has mainly been used to link rural and remote health care facilities with specialists in metropolitan areas, including a Virtual Trauma and Critical Care Unit that links local doctors to specialists in Melbourne (Health and Community Services Committee, 2014). There have also been many telehealth pilots across Victoria, funded through a range of State and Commonwealth mechanisms. Based on Medicare Australia telehealth data, the total number of specialist telehealth consultations in Victoria is growing (from around 10,000 consultations in the first quarter of 2013 to over 20,000 consultations in the third quarter of 2014) (Department of Health (Vic), 2014a).

In 2013, the Health Innovation and Reform Council (HIRC) assessed the status of telehealth adoption in Victoria (Department of Health (Vic), 2013). The HIRC also considered what Victoria needed to do to support health services that were considering telehealth service models. The HIRC found there was significant potential to improve the rate of telehealth adoption across the system; the current telehealth environment being described as variable, complex, fragmented and lacking connectivity (Department of Health (Vic), 2015).

Based on the HIRC's recommendations, the Telehealth Unit (THU) was established in the Department of Health. The role of the THU is to lead the development of a strategy that will support the uptake of telehealth services within health services and by consumers (Department of Health (Vic), 2013). A Telehealth Advisory Committee meets quarterly to provide advice and support to the THU to enable it to progress its work.

In May 2013, the Minister for Health funded four telehealth projects to improve access and promote uptake. These included building telehealth capacity in Aboriginal Health Services, bringing specialist care to rural and regional areas, and improving access to culturally appropriate services for people from refugee backgrounds (Department of Health (Vic), 2014b).

Examples of selected telehealth services

- The Victorian Stroke Telemedicine (VST) program: further detail can be found in section 4.2.1.2 in the *Final Report* and in Appendix J.
- The Grampians Rural Health Alliance Victoria started in 2005 and comprises of 40 sites, including: 12 hospital-based health services, four bush nursing centres and several community health centres. It provides technology, applications and communications solutions to connect regional health services (Gray, et al., 2011).
- The Loddon Mallee Health Alliance has focused on a Virtual Trauma and Critical care Unit which links local doctors to specialists in Melbourne (Health and Community Services Committee, 2014).
- Tunstall healthcare is working with Melbourne's Western Health Department of Nephrology to use telehealth to support patients during in-home dialysis. The Home Therapies Utilising Tele-Health Guidance and Monitoring Project uses an Integrated Care Platform and in-home dialysis equipment to allow patients to conduct their own dialysis. Patients presenting to hospital have reduced by almost 50 per cent and those choosing in-home dialysis has increased by 33 per cent (Health and Ageing Australia, 2014).

South Australia

Telehealth in South Australia (SA) is used across a relatively limited range of specialities; however it was an early leader in the field of telepsychiatry. Since 1995, mental health services have been provided from Adelaide to regional and remote sites

using telehealth facilities. The network now involves some 80 sites (DSTC for Centre of Military and Veteran's Health, 2005). Telehealth is not centrally coordinated and is managed through individual hospitals (Bywood, et al., 2013). The main telehealth technology used is videoconferencing (for both clinical and educational activities). More recently, telehealth services have been extended to cardiology, cancer, rehabilitation, geriatric evaluation and palliative care services (Health and Community Services Committee, 2014).

Examples of selected telehealth services

- Rural and Remote Mental Health Service: further detail can be found in section 4.2.1 in the *Final Report* and in Appendix J.
- The Integrated Cardiovascular Clinical Network was set up to support rural health services in responding to acute patient presentations. The service involves a number of components including: a roster of on-call cardiologists; point of care testing machines in rural hospitals to conduct blood tests when a patient presents with chest pains; a network of ECG machines which transmit their results to the cardiologists; a system to deliver thrombolytic drugs to rural hospitals; guidelines; and the ability to conduct video consultations between the patient, rural practitioner and the cardiologist (Wade, 2014).



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Tasmania

Telehealth in Tasmania consists predominantly of videoconferencing for a broad range of applications. The Telehealth Tasmania Network commenced operations in 1998 and enables the support and delivery of health services across the state. Telehealth services

include remote patient monitoring, multi-disciplinary case reviews, telehealth consultations, interstate specialist appointments and extensive clinical education programs. All clinical disciplines use the telehealth network (Gray, et al., 2011).

Examples of selected telehealth services

Nil

Northern Territory

Telehealth in the Northern Territory (NT) is still in its infancy and there is limited use across the state. Telehealth NT was established in 2012 and is focused on providing health care and eLearning to remote NT regions (Department of Health (NT), 2013). It

operates in three main areas: provision of specialist care, critical care and workforce support (particularly to support remote NT regions) (Department of Health (NT), 2013; Gray, et al., 2011). Telstra is also partnering with the NT Government to build a National Telehealth Connection Service. This will initially provide telemedicine services to people in remote communities. It will involve coordinating clinical-grade video conferencing and scheduling services with metropolitan specialists initially for Aboriginal health and people living in remote communities (McDonald, 2014b).

Examples of selected telehealth services

- The Health eTowns project improved health and education outcomes for Indigenous populations in 20 towns, 41 remote communities and five hospitals across the NT (and six sites in WA). The project delivered specialist care to remote communities; facilitated the use of video, audio and data-sharing facilities for remote monitoring and treatment; and provided online education for health care workers (Health InfoNet, 2014).
- The NT telehealth network works with the AMS Alliance NT and health services to enable video consultations to NT hospitals. It is available for critical care, burns, pre-admission clinics, rheumatology, renal, oncology and respiratory (Health and Community Services Committee, 2014).
- Telstra is partnering with the NT Government to build a National Telehealth Connection Service. This will initially provide telemedicine services to people in remote communities. It will involve coordinating clinical-grade video conferencing and scheduling services with metropolitan specialists initially for Aboriginal health and people living in remote communities. The service builds on existing infrastructure and is currently operating in community health centres in Tennant Creek and Santa Teresa, an Arrernte indigenous community near Alice Springs (McDonald, 2014b).



Australian Capital Territory

There is some telehealth activity in the Australian Capital Territory (ACT). ACT Health clinicians provide complex clinical advice to clinicians in emergency departments in surrounding NSW towns using telehealth (Health and Community Services Committee,

2014).

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Examples of selected telehealth services

• ACT Health funds telehealth consultations for patients from Canberra Hospital to cancer geneticist at Prince of Wales Hospital in Sydney (Health and Community Services Committee, 2014).

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Australia-wide services

A number of telehealth services are offered to patients and consumers across Australia, predominately using video-conferencing technology. These services are managed and delivered by a range of organisations including Telstra, the National Blood Authority, the

Royal District Nursing Service and Healthdirect Australia (Healthdirect Australia, 2014; National Blood Authority, 2014; Royal District Nursing Service, 2013; Telstra, 2014; Telstra, 2014). The services offered include: linking patients to general practitioners for consultations via videoconferencing; chronic condition management via a mobile app; 'virtual visits' to patients at home using video links; and video call technology to link consumers with counsellors for support with pregnancy, childbirth and early parenthood issues.

Examples of selected telehealth services

- *ReadyCare* is a new service that connects people to GPs over the phone for consultations (delivered in partnership with Europe's leading telemedicine company MedGate). It is available to 4.2 million people and has hosted 3.4 million consultations. It provides over 4300 consultations daily and operates 24 hours. It is based on clear, evidence based clinical guidelines. Doctors undertake intensive training and supervised teleconsultations and must pass a communication and protocol exam prior to offering consultations (Telstra, 2014).
- *MyHealthPoint* is a chronic condition management platform that gives carers access to patient health information through a web portal or mobile app. The cloud-stored patient records can be updated from a number of sources including health devices (BP monitors, etc) and wellness devices through Bluetooth or wi-fi networks. They can also be updated manually. *MyHealthPoint* also provides reminders and alerts to prompt medication consumption, notification of failure to complete a test or registration of an out-of-range reading. Reported benefits include improved diagnosis and treatment, increased responsiveness, improved self-management, and reduced doctor and hospital visits (Telstra, 2014).
- *MyABDR* is a secure app for smartphones and a computer website that changes the way people with bleeding disorders, such as haemophilia, monitor and treat their condition. It enables patients and their carers to record bleeds in their home in real time. The details are listed on their clinical record and accessible to clinicians in real time. Benefits of *MyABDR* include: increased convenience for patients (quick and easy to record information about treatments and bleeds, update contact info, etc) and more efficient record keeping (haemophilia centres don't need to re-enter or upload online patient diaries into their systems) (National Blood Authority, 2014).

I.2 Selected international jurisdictions



Canada

Telehealth continues to be an area of rapid expansion both in volume and type of services provided for health care and health education. Telemedicine networks are established across all jurisdictions, but their operation varies. In Ontario, Manitoba, Newfoundland and Labrador there is one telehealth program for the province. In British

Colombia, New Brunswick and Nova Scotia the telehealth programs are based on regions or health authorities. On Prince Edward Island, telehealth programs are run through hospitals (Health and Community Services Committee, 2014).

Canada is often considered a leader in the use of video technology. Canada has developed selfsustaining, well-integrated video-conferencing services, unlike Australia where telehealth programs are often still grant funded and not self-sustaining (Praxia Information Intelligence and Gartner, 2011). The number of clinical sessions increased from around 185,000 in 2010 to 290,000 in 2012 and has grown by around 195% since 2006. Telehealth is used across 79 distinct clinical specialities. The most commonly reported services being delivered in 2012 were mental health (psychiatry and psychology), cardiology, diabetes, genetics, oncology, chronic pain, neurology, and rehabilitation (COACH, 2013). Telehealth is managed by different entities in each province and territories (DSTC for Centre of Military and Veteran's Health, 2005; Praxia Information Intelligence and Gartner, 2011).

The OTN was consistently referenced by participants in Nous' consultations as a good practice example of a telehealth service. More details about this service are provided in Appendix J.

A telehealth program in British Colombia (2011) was providing two types of clinical services: an emergency department trauma service providing clinical support from a tertiary hospital to peripheral sites, and a maternal and paediatric palliative care service. The palliative care service consisted of a range of services being provided to 13 hospital sites and community centres by a tertiary hospital.

Beyond personal cost savings for patients, it is estimated that telehealth solutions across Canada resulted in savings of \$55 million per year (due to cost avoidance) (Praxia Information Intelligence and Gartner, 2011).



United Kingdom

The majority of telehealth services in the United Kingdom (UK) are small scale, pilot projects. Telehealth services include teleradiology, teleneurosurgery and telepsychiatry, as well as the transmission of echocardiographic images, electronic referrals and

videoconferencing between primary and secondary providers (Gray, et al., 2011). The UK is finding it a challenge to transition these into mainstream service delivery, mainly due to poor communication and confusion over the role, purpose and direction of telehealth programs) (Gray, et al., 2011).

The National Institute for Health Care Excellence has recently been tasked with helping the National Health Service adopt new technologies, by working directly with industry to identify benefits and addressing specific barriers to uptake (Medical Technology Association of Australia, 2012).

United4Health, managed by the Scottish Centre for Telehealth and Telecare, provides a good practice example of how telehealth can be used to provide home-based monitoring care to patients. It is described in more detail in Appendix J.

New Zealand

New Zealand has multiple individual telehealth services that handle approximately two million contacts each year (the Ministry of Health in New Zealand counts telehealth as telephone and web-based services). Commercial providers, universities and non-government

organisations deliver current telehealth services in New Zealand. Services (predominantly telephone advice lines) are available for general health advice and triage, child health advice, mental health services, immunisation advisory, and Hepatitis C education and support services.

In 2011, the Government announced it would roll out a comprehensive telephone advice service. The aim of the service is to consolidate the fragmented telehealth environment, improve accessibility of care, and reduce the burden on after-hours primary care services and hospital emergency departments. The comprehensive service would provide access to nurses, GPs, and pharmacists, and potentially with ambulance service paramedics (Minister for Health Tony Ryall, 2013).

The TeleDOT Foundation Project provides a good practice example of chronic disease management using telehealth (for Tuberculosis patients). More detail on this serve is provided in Appendix J.



Norway

Telehealth is well established in Norway and has been in use since the 1980s. It covers a wide range of applications including: tele radiology, telepathology, tele dermatology, tele-remote endoscopy, remote gastroscopy, tele-echocardiography, remote transmission of electrocardiogram (ECG), telepsychiatry, tele-ophthalmology, teledialysis, tele-emergency

medicine, teleoncology, tele care, telegeriatrics, teledentistry, maritime telemedicine, electronic referrals and discharge letters, electronic delivery of laboratory results and distance education. In 1996, Norway was the first country to implement an official telemedicine fee schedule allowing reimbursement for telehealth providers (Gray, et al., 2011).

The Norwegian Centre for Telemedicine (NST) at the University Hospital of North Norway is one of the largest centres in the world for telemedicine and had established telemedicine services within most suitable areas in Norway. In 2002, NST was appointed as the World Health Organization collaboration centre for telemedicine (Hartvigsen, 2013).

The Norway TeleECG Initiative provides a good practice example of telehealth-enabled critical care. More detail is provided in Appendix J.

Appendix J Good practice examples of clinical telehealth models nationally and internationally

This appendix provides detailed information on selected good practice examples of clinical telehealth models in Australian jurisdictions (excluding NSW) and internationally (including Canada, New Zealand, Norway, and the United Kingdom).

	Emergency Telehealth Service (ETS)
	• The WA Country Health Service introduced ETS as an innovative pilot program in 2012.
	 The service uses high definition videoconferencing to link a team of emergency specialists (generally based in Perth, but also across WA and even NSW) to small hospital emergency departments across WA (State of Western Australia, 2014).
Western Australia	• The WA Department of Health regards this emergency telehealth service as highly successful and has seen outstanding results. Observed benefits include empowerment of local clinicians to deliver timely, quality emergency and often life-saving care to patients who would otherwise have to travel significant distances to receive medical care. In 2014, ETS received a Premier's Award for Excellence in Public Sector Management in the ' <i>Improving Government</i> ' category (State of Western Australia, 2014).
	 In January 2015, the WA Department of Health reported that around 40 of the 66 regional sites were connected.
	Townsville Cancer Centre (TCC) teleoncology service
	 Townsville Cancer Centre (TCC) teleoncology service TCC is a comprehensive cancer centre that uses videoconferencing to manage medical oncology patients from rural and remote areas in Queensland (specifically, Townville and Mt Isa Health Service Districts).
Queensland	 Townsville Cancer Centre (TCC) teleoncology service TCC is a comprehensive cancer centre that uses videoconferencing to manage medical oncology patients from rural and remote areas in Queensland (specifically, Townville and Mt Isa Health Service Districts). Patients are managed exclusively via videoconferencing from the first consultation to treatment and follow-up. Patients are accompanied by a chemotherapy competent nurse, senior medical officers and allied health workers during the video consultations. Over 100 consultations have been conducted with 200 patients (including 30 Indigenous patients) since the service began.
Queensland	 Townsville Cancer Centre (TCC) teleoncology service TCC is a comprehensive cancer centre that uses videoconferencing to manage medical oncology patients from rural and remote areas in Queensland (specifically, Townville and Mt Isa Health Service Districts). Patients are managed exclusively via videoconferencing from the first consultation to treatment and follow-up. Patients are accompanied by a chemotherapy competent nurse, senior medical officers and allied health workers during the video consultations. Over 100 consultations have been conducted with 200 patients (including 30 Indigenous patients) since the service began. Initial challenges were overcome by providing staff with training on the relevant technology. Other reported enablers include upskilling rural generalist clinicians, having a telehealth coordinator to provide support, increasing the number of staff at the providing end, and availability of computer tomography and pathology in Mt Isa (Sabesan, 2011).

	The Victorian Stroke Telemodicine (VST) program
	 A virtual system links doctors at rural Victorian hospitals to a network of Melbourne-based neurologists who provide treatment advice about patients with stroke symptoms. The neurologists use real-time access to patient data, audio-visual communication and brain imaging to facilitate remote consultations.
Victoria	 In 2014, the VST program was operational at four sites across Victoria. During the period of March to June 2014, 42 patients at three hospitals received a VST consultation (Cadilhac, et al., 2014). Reported benefits include improved assessment and diagnosis times, stroke education to clinical hospital staff, and improved collaboration between metropolitan and regional hospitals (Hospital and Aged Care, 2013).
	 Reported lessons learned from implementation of the VST program included the need to: allow adequate time for stakeholder engagement; have dedicated local support; have contingency plans if technology fails; provide follow-up support for hospitals; provide adequate change management; and provide adequate clinical education (Vu, et al., 2014).
	Rural and remote mental health services
	• Country Health SA provides recovery-focused mental health services to people with a mental illness who live in regional and remote areas of SA. A telepsychiatry service is provided from Glenside Campus in Adelaide to rural and remote patients using videoconferencing. The service provides patients with access to an initial assessment, discharge planning and ongoing treatment while allowing them to remain in or close to their own community (SA Health, 2012). The service is staffed by psychiatrist consultants and registrars. (Moseley & McPhail, 2013).
South Australia	• The service is working towards having consultants focus on patients in a specific country area and complement the telepsychiatry services with limited visits for face-to-face consultations (Moseley & McPhail, 2013).
	• An enterprise wide video-conferencing network designed to deliver video and audio of sufficient quality to perform clinical assessments was implemented to support the service (as the first step in a whole of health solution). There are 100 videoconferencing units installed across 80 sites in country SA. The units are supported by central infrastructure to schedule, manage, monitor, and report on usage, as well as user support, a help desk function, and training and education. It was officially launched on August 2012 (Moseley & McPhail, 2013).
	 It has been reported that the service is firmly embedded in normal clinical practice and is sustainable (DSTC for Centre of Military and Veteran's Health, 2005; Gray, et al., 2011).

	Ontario Telemedicine Network (OTN)
	• OTN was established in 2006 as an independent, not-for-profit cooperation funded by the Government of Ontario. OTN's mission is 'to develop and support telemedicine solutions that enhance the access and quality of health care in Ontario' (Ontario Telemedicine Network, 2014a).
	• OTN services support the delivery of health care across four channels: healthcare office (which provides a single point of access for videoconferencing from fixed and mobile systems, and supports the referring, scheduling and store-and-forward capabilities), acute care, home and community care, and learnings and meetings (Ontario Telemedicine Network, 2014b). OTN telemedicine programs are provided for a range of specialities including primary care, oncology, surgery, mental health, dermatology, stroke, burns and ophthalmology.
Canada	• The network uses a variety of innovative technologies, including video-conferencing systems, scheduling systems, web conferencing and a comprehensive telemedicine directory (Ontario Telemedicine Network, 2014b).
	• OTN's members include 1,350 health care and education organisations and it has 230 employees. In 2012-13, 700 new consultants joined the network (Health and Community Services Committee, 2014).
	 The OTN has seen outstanding results, including:
	 a 720% increase in telemedicine activity since its launch in 2006
	 306,364 telemedicine events (clinical and non-clinical) in 2013-14 (a 31% increase from the previous year)
	 1.3 million patient encounters since its launch in 2006
	 almost 260 million kilometres of patient travel avoided due to the use of telemedicine
	• 2,745 physicians and allied health professionals participated in clinical events in 2013-14
	 40% of health care providers were frequent users of telemedicine in 2013-14 (a 24% increase from the previous year) (Ontario Telemedicine Network, 2014c)
	 it is reported to be self-sustaining funding and integrated into existing systems (Gray, et al., 2011).
	TeleDOT Foundation Project
New Zealand	• TeleDOT uses a combination of video-conferencing software, computers, and mobile devices to provide care for tuberculosis (TB) patients on directly observed therapy (DOTS). The program allows an increased number of patients to be seen within current staffing levels (Pikholz, 2014). The pilot was informed by learnings from two other TB DOT pilots previously run in British Columbia (Canada) and SA. There have been 31 patients on TeleDOT since early 2013 with the average length of time using the service ranging from five to 36 weeks (National Health IT Board, 2014).
	• Evaluation of the project found there was a very positive response from clients and staff. The project met objectives of delivering a 10% increase in DOTS provided by Auckland Regional Public Health Service (over a six month period and within existing resources) (Pikholz, 2014).
	• Key success factors include: willingness to be innovative, the provision of funding for a pilot, supportive management, willing and enthusiastic workforce culture/staff, and basing the pilot on 'best practice' project management guidelines and documentation (National Health IT Board, 2014).

	TeleECG Initiative
	 The TeleECG Initiative in Norway is a telemedicine service used to facilitate early diagnosis and treatment of patients with suspected myocardial infarction (who are not in hospital).
Norway	 Ambulances are fitted with equipment that captures and transmits ECG images to hospitals, which are then analysed by a cardiologist who is able to make a diagnosis and recommend a course of action (World Health Organization, 2010).
	 Beginning in northern Norway as a way to reduce time from acute cardiac illness to treatment, teleECG is now available in over 100 ambulances and offered throughout the country.
	 The teleECG system has helped decrease call time to treatment time, resulting in faster treatment and better patient outcomes. Cardiac patient outcomes have improved by 15–20%. It has also improved collaboration between health professionals (World Health Organization, 2010).
	United4Health (Scottish Centre for Telehealth and Telecare)
United Kingdom	 United4Health (Scottish Centre for Telehealth and Telecare) The United4Health programme provides patients living with diabetes, chronic obstructive pulmonary disorder, or heart failure increased self-management of their disease. Home-based monitoring devices enable earlier detection when a patient's condition deteriorates, and supports self-management, early treatment, and potentially avoids hospitalisations. Patients may also be able to be discharged earlier from hospitals as they can be more closely monitored at home during recovery (Scottish Centre for Telehealth and Telecare, 2014).
United Kingdom	 United4Health (Scottish Centre for Telehealth and Telecare) The United4Health programme provides patients living with diabetes, chronic obstructive pulmonary disorder, or heart failure increased self-management of their disease. Home-based monitoring devices enable earlier detection when a patient's condition deteriorates, and supports self-management, early treatment, and potentially avoids hospitalisations. Patients may also be able to be discharged earlier from hospitals as they can be more closely monitored at home during recovery (Scottish Centre for Telehealth and Telecare, 2014). The United4Health programme will run for three years from January 2013. It will provide services for up to 7,700 people across multiple regions in Scotland.

Appendix K Existing policies, strategies and frameworks relevant to telehealth in NSW

Numerous existing policies, strategies and frameworks have relevance for telehealth in NSW. The main documents are summarised in Figure 21 and outlined in more detail in Table 3 of this appendix.

Figure 21: A summary of the main existing policies, strategies and frameworks relevant to telehealth in NSW



National strategies	
National E-Health Strategy (Department of Health, Commonwealth)	 The National E-Health Strategy was developed with key stakeholders and provides a guide to further the development of E-Health in Australia. It reinforces the existing collaboration of the Commonwealth, State, and Territory Governments on the core foundations of national E-Health systems and identifies priority areas where this can be extended. The Strategy partly focuses on telehealth and electronic consultation tools to improve rural, remote and disadvantaged community access to health services. One implementation target (over the next ten years) is that up to 20% of consultations should use electronic consultation or telehealth capabilities. The strategy makes recommendations for effective governance including: National eHealth governing board, eHealth entity and eHealth regulation functions (Deloitte, 2008).
National Strategic Framework for Rural and Remote Health (Standing Council on Health)	 The National Strategic Framework for Rural and Remote Health presents a national strategic vision for health care in regional, rural, and remote areas of Australia. Specific objectives of the framework include supporting the adoption of ICT for telehealth applications, implementing flexible funding mechanisms for rural and remote health services, including telehealth services and recruiting specific telehealth/eHealth coordinators (Standing Council on Health, 2012).
Towards a National Strategy for Telehealth in Australia 2013- 2018 (Australasian Telehealth Society)	 The Australasian Telehealth Society recommends there should be one strategic, direction-setting reference document to maximise the value of new developments in telehealth over the next 3-5 years. The reference document should: draw on existing documents and perspectives (including those of consumers); align with emerging health care reforms and budgets; guide innovation including in funding and business models; inform public policy directions; and enable adoption of clinical and technological changes in health care. The Australasian Telehealth Society recommends there are three strategic focus areas, which are: a focus on national priority groups (aged care, poorly mobile, rural and remote), applying fit for purpose models; and optimising the focus for implementation (Australasian Telehealth Society, 2013).
NSW-specific strate	gies and plans
2012 State Infrastructure Strategy (and 2014 update) (Infrastructure NSW)	• The strategy provides advice to support the Government's objective of providing 'the right infrastructure at the right time'. The strategy notes that NSW MOH has progressed reforms in eHealth, and recommends that NSW MOH continue to pursue an e-enabled system (Infrastructure NSW, 2014).
A Blueprint for eHealth in NSW (NSW Health)	 The Blueprint for eHealth in NSW establishes eHealth NSW as a separate entity. The core responsibility of eHealth NSW will be to provide high level governance for NSW Health's information strategy, forward planning and delivery. Governance arrangements include establishing an eHealth Executive Council and appointing a Chief Executive Officer and Chief Clinical Information Officer. A new eHealth Strategic Plan will be developed, as well as a rural eHealth strategy. The eHealth Strategic Plan will steer investment in building eHealth capacity across NSW through consolidation and expansion of existing eHealth programs and new initiatives. Infrastructure issues to be addressed: data warehousing and patient portal flow (NSW Ministry of Health, 2013).
Corporate Plan eHealth NSW 2014-2017 (eHealth NSW)	• The Corporate Plan for eHealth NSW 2014-2017 outlines the organisation's vision and approach for delivering accessible, quality, efficient, and safe health care in NSW. The Plan focuses on supporting ICT investment for the next five years (from 2014) for state-wide eHealth initiatives, refreshing the eHealth vision, building capacity (especially in rural and regional NSW), and strengthening governance (eHealth NSW, 2014).

Table 3: Existing policies, strategies and frameworks relevant to telehealth in NSW

NSW Kids and Families Strategic Plan 2014-2024 (NSW Kids and Families)	 The strategic plan, 'Healthy, Safe and Well: A strategic plan for children, young people and families 2014-24', provides the road map for the next ten years for NSW Kids and Families. It aims to guide collective efforts to ensure participating agencies commit to taking responsibility and accountability for shared goals and objectives. The strategic plan includes a specific objective related to eHealth. The objective is to 'develop and expand eHealth' with specific strategic relating to: growing system connectivity to improve patient management and integrated care; developing systems to better capture, measure and report on activity, quality and cost effectiveness; and using technology to boost clinician skills via access to specialist advice, peer review, simulation and video (NSW Kids and Families, 2014). 	
NSW Rural Health Plan: Towards 2021 (NSW Health)	 The NSW Rural Health Plan aims to strengthen the capacity of rural health services. The three key priorities of the plan are to: enhance the rural health workforce, strengthen rural health infrastructure, and improve rural eHealth. Under the third strategy related to eHealth, specific initiatives focus on improving eHealth infrastructure, governance, collaboration, integrated services, funding arrangements and support (NSW Ministry of Health, 2014). 	
NSW State Health Plan: Towards 2021 (NSW Health)	 The strategy outlines how NSW will invest in enablers to inform and support delivery of the integrated care strategy including: building and expanding investment in eHealth solutions (such as telehealth) to support communication and connectivity across health care providers and treatment settings. It also outlines how NSW will clearly articulate new arrangements in governance, privacy, capacity building and telehealth responsibilities. It will also establish eHealth performance measures and a rural eHealth strategy (NSW Ministry of Health, 2014). 	
Frameworks and gu	idelines	
ACRRM Telehealth Guidelines (ACCRM)	 The Australian College of Rural and Remote Medicine (ACCRM) standards provides a common approach and assists in the establishment of quality telehealth services. ACCRM states the framework should be a basis for relevant craft groups or clinical disciplines to develop profession and health-organisation specific telehealth guidelines (Australian College of Rural and Remote Medicine, 2012). 	
Australian Wound Management Framework (Australian Wound Management Association)	• The Australia Wound Management Association developed an 'easy to interpret' framework for wound providers who use telehealth. The aim is to assist providers to make decisions with due diligence on a range of implementation, technical and usage issues (Australian Wound Management Association, 2013).	
Guidelines for the use of telehealth for clinical and non-clinical settings (ACI)	• The ACI rural telehealth working group developed state-wide guidelines for those using telehealth across NSW. The aim is to provide a framework which will support improved use and continuity of telehealth services. It also aims to increase consistent telehealth usage patterns across the state by providing practical information and templates, and how to cost and document telehealth services (Agency for Clinical Innovation, 2014).	
Professional Practice Standards and Guides for Telepsychiatry (RANZCP)	 The Royal Australian and New Zealand College of Psychiatrists first developed a Position Statement and Guidelines in 1999 and they are reviewed every three years. The Professional Practice Standards aim to establish and enhance the quality and safety of telepsychiatry practice (Royal Australian and New Zealand College of Psychiatrists, 2013). 	
Selected LHD strategies and plans		
HNE telehealth clinical strategy 2010-2014 (HNELHD)	 HNELHD has a stand-alone telehealth strategy, which identifies four priority areas for development: tele-critical care, tele-ambulatory care, tele-home-based care, tele- workforce support. It covers current and ideal future state of telehealth in these areas in HNELHD (Hunter New England Area Health Service, 2010). 	

Murrumbidgee LHD Strategic Plan 2012-2015 (MLHD)	 MLHD's Strategic Plan includes a strategic action around increasing the use of telemedicine services for emergency assessments and using telehealth services for implementation of multidisciplinary and allied health care plans (Murrumbidgee Local Health District, 2012).
Southern NSW LHD Strategic Plan 2013-16 (SNSWLHD)	• SNSW LHD has committed to expanding its mental health services, and aims to achieve this partly through the expansion of the existing MHECS (detailed in Appendix A in the <i>Final Report</i>) (Southern NSW Local Health District, 2013).
Sydney LHD Strategic Plan 2012-2017 (SLHD)	 SLHD's strategic plan includes a specific strategy on expanding the use of telemedicine and outreach clinics to rural and remote areas (Sydney Local Health District, 2012).
Western NSW Strategic Plan Summary Document 2013- 2016 (WNSWLHD)	• The strategic plan cites a challenge for the WNSWLHD is supporting patients in rural and remote communities who need access to specialist medical skills. The plan notes telehealth provides a potential solution by supporting the efficient and cost effective delivery of care, ongoing workforce development, and support for isolated resources (Western NSW Local Health District, 2013).

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