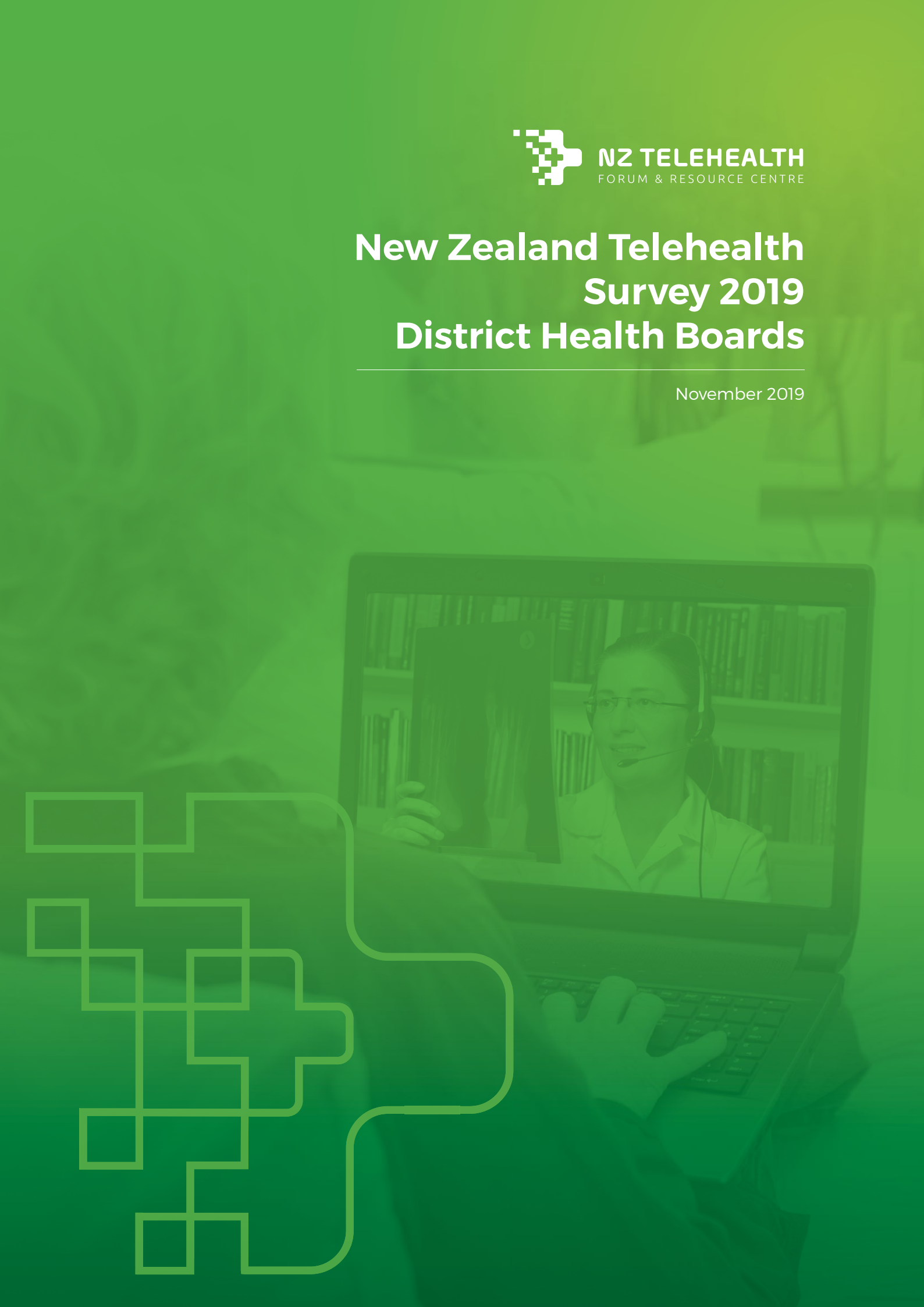
NZ TELEHEALTH
FORUM & RESOURCE CENTRE

New Zealand Telehealth Survey 2019 District Health Boards

November 2019



Message from the Chair

The New Zealand Telehealth Leadership group (NZTLG, previously Telehealth Forum) is proud to publish its second survey since its formation in 2011. The NZTLG was initially formed as a 'call to arms' and brought together a diverse group of clinicians, project managers, coordinators, executives and administrators from around the country and across the public and private sectors. It focuses on ways to move health care closer to home, making health care more convenient and available.

A lot has changed since the last survey in 2014. We have seen an increase in providers and services using telehealth and a wider range of suppliers. There is an ongoing debate on terminology with the recent evolution of the term 'virtual health care', which is often used interchangeably with 'telehealth'.

This report shows widespread development and recognition of the value of telehealth. Many organisations turn to telehealth as they strive to improve the services they deliver.

The rest of the world is also turning to telehealth. The National Health Service (NHS) in the UK has funded a primary care telehealth service and in Victoria, Australia an Acute Care Telehealth service has received public funding. Though not every attempt succeeds, the growth continues.

In this environment the report proves that a growing number of clinicians and services in New Zealand recognise the value of delivering health care by telehealth.

However, use of telehealth often relies on local champions and although many barriers have been broken down (namely interconnectivity and cost), others (such as lack of clear leadership and governance, difficulty navigating funding models and access to devices and high-speed internet connections) remain.

The report also indicates that data capture and knowledge of telehealth services is kept in silos. This greatly disadvantages New Zealand patients and health care providers and prohibits transparent learning and growth of services. This may be one of the reasons successful pilots fail to translate into business-as-usual services.

There is no doubt that telehealth improves the lives of patients by providing high value health care closer to home. International experiences prove that, as well as strong evidence here in New Zealand.

We hope that you find value this report and use it to further develop telehealth services within your organisation.

Dr Ruth Large
Chair NZ Telehealth Leadership Group, Emergency Physician, Rural Hospitalist and Clinical Director Information Services and Virtual Health Care, Waikato DHB

I love it, it's the same as talking to the doctor here…we can talk to them straight away if we need to… if we need him we'll be able to get on (to the video) and talk to him.

- JOE HOKIANGA, RENAL PATIENT, WHAKATANE

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Report Summary

This report presents the results of a survey of telehealth activity in New Zealand's 20 District Health Boards (DHBs) carried out between October 2018 and March 2019 by the New Zealand Telehealth Leadership Group (NZTLG) . The NZTLG defines telehealth as the use of information and communication technologies to deliver health services when patients and care providers are not in the same physical location.

The survey format was based on a previous national survey in 2014 and a brief survey carried out in 2011 when the New Zealand Telehealth Forum was established. In 2014, all 20 DHBs responded. In 2019 all 20 DHBs responded to the organisational survey, and 18 DHBs responded to the separate survey about clinical services.

The 2019 survey shows that telehealth uptake has increased considerably across all the DHBs. Many more clinical services engage in the use of video-based telehealth technologies. Usage for patient consultations has grown from 16 DHBs in 2014 to 19 in 2019. The growth is significant, not only in the number of DHBs, but also in the number of clinical services represented, the frequency of usage and the types of telehealth interactions.

It is advantageous, convenient, care delivered closer to home for patients. Allows more new and complex patients to be seen. Decreases waiting lists.

- COMMENT FROM CLINICIAN ON TELEHEALTH BENEFITS

There are many good stories about the benefits to both patients and clinicians. DHB clinical services forecast a significant increase in the use of telehealth services. Yet while management accepts and understands the benefits of telehealth, DHB readiness appears to fall short. Half of the DHBs report that capacity is insufficient to meet current, let alone future, demand.

Several DHBs have implemented lower-cost software-based VC solutions and this has dramatically increased their ability to meet growing demand. Software solutions allow DHBs to prioritise their hardware-based solutions for more complex uses such as MDM, frontline clinical applications and larger meetings.

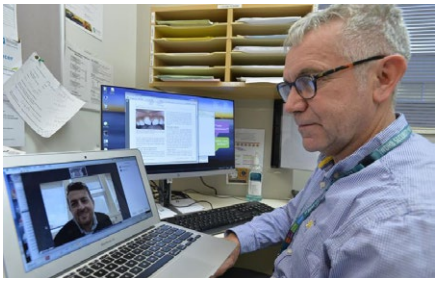
> *One clinician commented that telehealth had "huge untapped potential".*

The survey shows strong clinical support for telehealth and pockets of excellence continue to develop. One clinician commented that telehealth had 'huge untapped potential'.

However, champions still appear to lead most telehealth development. There is still much to be done for telehealth to become a sustainable and business-as-usual enabler embedded in health care delivery. There is room for improvement in business plans, investment in infrastructure, human resources, the implementation of business-as-usual practices and formal evaluations to support robust business cases.

The 2019 survey reflects a point in time and is based on self-reported telehealth activity. The findings, particularly those based on the data gathered on clinical services, are indicative rather than definitive. However, the data is reliable enough to illustrate trends and the scale of telehealth-related activity. In the time between the survey and this report activity has continued, new initiatives have started, some pilots have finished and become normal services and other changes will have occurred.

[1] While data was gathered in late 2018 and 2019, the report uses '2019' when citing the results.



This survey is specific to DHBs. We will cover primary care and non-governmental organisations in a separate survey. We have seen growing interest and activity in telehealth services from primary care. A Ministry of Health report in September 2019 found that 30 practices have now introduced video-based telehealth technology. The NZTLG has established a workstream to support uptake in primary care.

▸ Key Findings

Benefits

DHB staff members either currently involved in or planning telehealth services submitted over 300 responses about the benefits of telehealth. They endorsed the internationally recognised benefits of telehealth and said the benefits that they anticipated were realised including:

OVER **300** responses about telehealth benefits from DHB staff

- reduction in travel time and costs for patients and clinicians (the most frequently cited benefit)
- improved access for patients (equity and convenience)
- ability to provide quality treatments (eg, use of video instead of just telephone)
- ability to see patients faster, reduce waiting lists, avoid hospital admissions and reduce DNAs
- increased opportunities for collaboration with patients and other clinicians
- efficiency in the allocation of clinical resources
- improving staff safety by reducing risks associated with clinicians travelling (eg, when seeing patients in prisons)
- upskilling of staff.

Respondents also reported unexpected benefits, including:

- reduction in cross infection risks that exist when patients are seen in the same physical locations
- more timely follow up on patient results and referrals for further treatment
- greater willingness of clients to accept going before a judge
- patients engaged with a service are willing to have more regular appointments via telehealth
- ability to use clinical time saved in travelling for education
- respect and understanding of interdisciplinary team roles.

Hugely valuable … has potential to maximize effective use of time for clinicians and service users by reducing travelling … could empower and enable access for remote service users and whanau…has major advantages in assisting with equity of access.

- COMMENTS BY CLINICIANS ON TELEHEALTH VALUE

A small number of respondents reported not realising the benefits, mainly due to clinician resistance and under-utilisation. A few reported unintended consequences such as an administrative burden on the process, especially in the early stages, and the need to have appropriately trained staff in remote locations supporting patients.

Although most clinical services said they either weren't tracking key performance indicators or hadn't started yet, some tracking is taking place, mainly during pilots and via patient satisfaction surveys. Examples include tracking did not attends (DNAs), clinician satisfaction and plans for tracking patients with long term chronic conditions being kept out of hospital, well and at home.

Seven DHBs said they had carried out formal evaluations, an increase from four in 2014.

Clinical telehealth services

We have seen a significant increase in the range of clinical services using video-based telehealth technologies for business-as-usual services, conducting pilots and planning new services. The number of DHBs using video for patient consultations has increased from 16 in 2014 to 19 in 2019. Both the number of services available and the frequency of their use have increased.

DHBs using video for patient consultations

2014 - **16**

2019 - **19**

Eighteen DHBs provided findings on clinical services in five major categories: adult and women's health, allied health, ambulatory and clinical, mental health and paediatrics. Respondents identified 1324 initiatives where telehealth is either active, in pilot or planned. A few reported on initiatives that have ended, in some cases due to a lack of funding.

In 2014, 16 DHBs used or planned to use telehealth in approximately 55 services for patient and clinician-only interactions. In 2019, all 20 of the DHBs actively used, piloted or planned to use telehealth technologies in more than 75 services.

There has also been an increase in the types of patient and clinician-only telehealth interactions. In 2014, the most common telehealth activities were clinical imaging (primarily teleradiology and teledermatology), videoconferencing for multidisciplinary meetings and patient follow-up appointments. In 2019, many more services reported using video for first patient and acute assessments, patient-only and group sessions in allied health, nurse-led clinics and clinician-to-clinician sessions.

Te Hono (from the Maori: to link or to bridge) is a one hour multidisciplinary meeting where patient cases and questions are presented by participants from primary care clinical teams to specialists present. Emphasis is on respectful, open, collegial discussion rather than didactic teaching…A range of positive outcomes were evident in our meetings last year, particularly around better management of complex cases.

- DR WALAA SAWEIRS, NORTHLAND DHB

Multi-disciplinary meetings

All DHBs are continuing to use videoconferencing for multi-disciplinary meetings (MDMs) and multi-disciplinary team meetings (MDTs). While oncology was the early leader, use by other specialties has grown, along with primary care and allied health. Some clinical teams require purpose-built rooms and equipment (for example, oncology and radiology). Other clinical teams find standard equipment or mobile options suitable.

The number of DHBs reporting that they have protocols and guidelines for MDMs has increased from nine in 2014 to thirteen in 2019, while those reporting that they have MDM coordinators has decreased from 16 to 14.

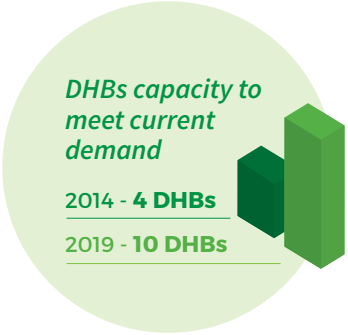
Other technologies

The most significant change in other technologies is in the growth of the use of email, text messaging and social media to communicate with patients. There has been some growth in the use of mobile and smartphone applications, initially for health/wellness and more recently for accessing and updating clinical information. Newer technologies such as chat bots and therapeutic applications are starting to emerge.

The uptake of telemonitoring applications remains low, increasing from three to four active DHBs. Four DHBs plan to introduce monitoring applications, some using smartphones and video functions.

Telehealth infrastructure and capacity

There were many positive improvements between 2014 and 2019. DHBs reporting adequate telehealth infrastructure and investment increased from five to eight and those with centralised booking systems increased from 12 to 15.



Yet capacity clearly presents a significant challenge. Ten DHBs report they have capacity to meet current demand (up from four in 2014), however the survey shows a forecast for significant growth in planned services that many DHBs may not be able to meet.

In 2014, there were early signs of a trend toward software solutions for videoconferencing (VC) and a move away from fixed endpoint hardware solutions. The 2019 survey shows that although there is still a requirement for hardware solutions, there has now been widespread adoption of lower cost software solutions. These are being deployed to the full spectrum of mobile, tablet, desktop and room-based solutions. This has dramatically increased the ability of the DHBs to meet growing demand.

Governance

The governance category covers several internationally recognised factors important for achieving effective business-as-usual telehealth services. These include strong clinical leadership supported by dedicated resources, including telehealth programme managers/facilitators; management engagement and oversight guided by strategies and policies; and tools to support delivery.

The 2019 report shows that the level of clinical leadership has increased since 2014. While the number of telehealth clinical leaders appointed in the DHBs has remained at 10, more DHBs have clinicians serving in the role informally, often within their own service areas.

The number of telehealth programme managers/facilitators has increased from seven to twelve. Where these roles are filled, support for telehealth initiatives is much better. Fourteen DHBs provide training for clinicians in using of telehealth tools (primarily VC).

Yet there are now fewer DHB governance groups either dedicated to or overseeing telehealth strategy, policy, investment and service delivery. In 2014, 13 DHBs had the function, whereas in 2019, only 11 did.

In 2014, 10 DHBs had telehealth strategies and/or policies. In 2019, while only seven reported that they had their own strategies, most regions now have regional rather than DHB-specific strategies.

In 2014, 13 DHBs had protocols and guidelines for delivering telehealth services. In 2019, only seven DHBs reported having these tools.

protocols in place for delivering telehealth

2014 - **7 DHBs**

2019 - **13 DHBs**

Investment and technology barriers decreasing for many

Barriers to uptake

The survey shows several barriers have improved since 2014, while new barriers have emerged.

A notable improvement is the decrease in DHBs citing VC interconnectivity as a barrier, from 18 DHBs in 2014 to 13 in 2019. This occurred while the need for interconnectivity has grown significantly, due primarily to the increase in VC providers and solutions used by the DHBs. The improvement can be attributed to the efforts of the VC providers, Ministry of Health, NZTLG, DHB technical groups and others in addressing the issues. However, a high proportion of DHBs still cite interconnectivity as a barrier. Ongoing work on interconnectivity and interoperability, including addressing issues of proprietary equipment, should see further improvements for users, as will the full rollout of the National VC Directory.

Insufficient infrastructure and investment is still a major barrier, cited by 17 DHBs in 2014 and 15 DHBs in 2019. Given that the survey forecasts significant growth in telehealth usage, it will be difficult for supply to keep up with the demand. However, the acceptance and understanding of telehealth by senior management has improved since 2014, along with planning/funding. Only three DHBs now cite it as a barrier, indicating that there is an opportunity to gain support for further investment.

The lack of clinical support and accountability as a barrier has increased significantly from eight DHBs in 2014 to twelve in 2019. This may reflect the champion-led approach to telehealth, since the 2019 survey also shows a significant increase in active, pilot and planned services, with most of the clinical service forecasts supplied by clinicians.

Some DHBs report success with engaging clinical teams during pilot projects, while others report that it remains difficult to get clinical staff to use telehealth for patient consultations. While all barriers can limit uptake, experience shows that strong clinical leadership makes it easier to overcome barriers, particularly those over which the DHBs themselves have more control.

Telehealth is fully understood at the executive level, but it now requires leadership at service level.

The lack of standards, protocols and guidelines is still a barrier for 10 of the DHBs, reduced only slightly from 11 in 2014.

There was a surprising increase in DHBs reporting perceived patient unwillingness to participate in VC as a barrier, from three in 2014 to seven in 2019. However, the frequency is very low, and counter to the strong indication of patient acceptance reported in qualitative feedback from other surveys. It does recognise that some patients will be reluctant to substitute an in-person visit with a face-to-face video telehealth consultation.

As telehealth expands to patients at home and at work, two new questions in 2019 highlighted emerging barriers relating to patients. Fifteen of the DHBs cited patient access to devices as a barrier and twelve reported patients not having fast internet as a barrier. The health sector focus on closer-to-home means that these barriers need to be managed to ensure equity of access, especially since some of the patients who would benefit most from telehealth are the least equipped to access it.

Telehealth Resources

Mobile Health hosts the New Zealand Telehealth Resource Centre (TRC) on behalf of the NZTLG. It holds a variety of telehealth resources including case studies, standards and guidelines. The survey showed that most DHBs who have used it found it a useful source of information. The majority of DHBs indicated they wanted to see additional resources developed in all areas, most notably guidelines, case studies and industry presentations. Comments from respondents also provided valuable pointers to methods of promotion we can use to encourage further uptake of telehealth.

▸ Next Steps

The NZ Telehealth Leadership Group's main objectives include:

- ensuring that telehealth is on the agenda for national/regional strategies
- building capability by removing barriers and promoting centres of excellence
- building awareness and education in DHBs, PHOs, GPs and NGOs
- promoting the value proposition of telehealth/virtual health as an enabler of healthcare delivery
- promoting equity of access.

Based on this report's findings, the NZTLG will consider and prioritise the following in its work programme:

- promote compliance and effective usage of the Method of Delivery code
- review feedback on the barriersand work with the DHBs on addressing them. An example is the feedback on quality of video, which could be addressed with more education and better technology.
- enhance and promote the TRC, including the repository of documents and tools. This includes obtaining useful documents from DHBs and sharing as appropriate (eg, evaluations, protocols and guidelines)
- enhance and promote the interactive telehealth directory of services in the TRC using data gathered for this report and develop a mechanism to maintain its currency
- promote pockets of excellence and encourage peer collaboration at the specialty and professional level using the survey data on clinical services and case studies
- establish a means for identifying telehealth provider centres of excellence.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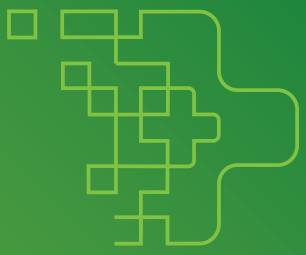


Part 1: DHB telehealth overview

Governance, benefits, barriers, infrastructure, promotions, evaluations, support

1

1. Introduction

This report presents the results of a survey of telehealth activity in New Zealand's twenty District Health Boards (DHBs) that was carried out between October 2018 and March 2019. The report is structured in two parts:

Sections 1 to 7 cover the telehealth environment in the DHBs and how they facilitate and support telehealth to improve the delivery of health care.

Sections 8 to 14 describe the activity in the clinical services regarding the current and planned use of telehealth technologies.

The survey was based on a previous national survey in 2014 and a brief survey carried out in 2011 when the New Zealand Telehealth Forum was established. The 2019 survey repeated most of the 2014 questions and included some new ones. This report compares results from survey to survey where applicable.

A working group within the NZTLG designed the survey. The format and initial reports were developed using the tool Qualtrics.

The survey was distributed in two parts. The first part — a general DHB overview — was sent to a single contact at each DHB. The second part was sent to the DHBs to distribute to clinical services that use telehealth.

All 20 DHBs responded to the general survey questions. Eighteen DHBs (all except Bay of Plenty and Tairāwhiti) responded to the clinical services questions.

The full set of survey questions will be available on the NZ Telehealth Resource Centre (TRC) website. www.telehealth.org.nz

[1]NZTLG Working Group members: Andrew Panckhurst, Communications Director Mobile Health; Judy Eves, Sector Portfolio Manager Data and Digital Ministry of Health; Patricia Kerr, Programme Lead NZTLG; Sam Selwyn PhD Student.

2. Telehealth governance

Several key performance indicators (KPIs) are internationally recognised as key enablers and success factors in achieving effective business-as-usual telehealth services. These include strong clinical leadership supported by dedicated resources including telehealth programme managers/facilitators, management engagement and buy-in, strategies, policies and tools to support delivery.

The figure below compares results for DHBs in 2014 and 2019.

Figure 1: Telehealth Governance - Summary Results 2014 and 2019

Governance Category	Governance Question	DHBs Yes 2014	DHBs Yes 2019
Staff Resources	An appointed telehealth **clinical leader?**	10	10
	An appointed telehealth **programme manager** / facilitator?	7	12
Investment / Oversight	Telehealth strategies / policies?	8	15
	A telehealth **governance group** or a group that includes telehealth oversight?	13	11
Delivery	Telehealth **protocols and guidelines** for provision of services?	5	7
	Training for clinicians in using telehealth tools for service delivery?	NA	14
	Method of **counting** telehealth consultations?	4	11

▸ Staff Resources

Telehealth Clinical Leaders

In 2011, only Canterbury and West Coast had an appointed clinical leader (shared). By 2014, 10 DHBs had clinical leaders. In 2019, 10 DHBs reported having a clinical lead, though not the same 10 as in 2014. Some other DHBs report having clinical leads serving in the roles informally or at the clinical service level.

The loss of clinical leads in some DHBs by 2019 may be because clinical champions have left and new appointments haven't been made.

Telehealth Programme Managers

In 2014, seven DHBs had telehealth programme managers/facilitators: Auckland, Bay of Plenty, Canterbury, Northland, Waitematā, Waikato and West Coast. In 2019, 12 DHBs had the role, with the addition of Counties Manukau, Lakes, Nelson Marlborough, Southern and Tairāwhiti. Capital & Coast DHB has a vacant telehealth programme manager position. There is an indication that other DHBs are considering the role based on recent requests for sample job descriptions.

▸ Oversight / Investment

Telehealth Strategies / Policies

In 2014, eight DHBs had an individual telehealth strategy. Since 2014 Northern, Midland and South Island regions have created regional telehealth strategies and many DHBs have adopted them.

The Northern Region strategy is incorporated in the Regional Information Systems Plan (ISSP). Waikato DHB led the Midland Region strategy development and the South Island Alliance developed the South Island Region strategy. MidCentral DHB is the only DHB in the Central Region that reported having a strategy. Capital & Coast DHB reported that their strategy is in progress.

Telehealth Governance Groups

Formal telehealth governance groups didn't exist in the DHBs in 2011. In 2014, 13 DHBs had governance groups. In 2019, this number has dropped to 11 DHBs.

Auckland, Lakes, Northland, Southern and Taranaki continue to have a group in 2019 and Counties Manukau, Hawke's Bay, MidCentral, Tairāwhiti and Waitematā have introduced telehealth governance. Capital & Coast has established a Steering Group and is interested in expanding this to include Hutt Valley and Wairarapa.

Canterbury, Hutt Valley, Nelson Marlborough, Waikato, Wairarapa, Waitematā and West Coast had a form of telehealth governance in 2014, yet in 2019 report that they don't have the function. This could be due to regional groups having more of a strategic role.

▸ Delivery

Telehealth Protocols and Guidelines

DHB protocols and guidelines include procedures for patient consent, clinic bookings and other processes associated with patient-related scheduled and unscheduled telehealth interactions. Guidelines for MDMs are considered separately (see Section 12).

In 2014, five DHBs had protocols and guidelines. In 2019, seven DHBs had these tools: Auckland, Bay of Plenty, Canterbury, Northland, Tairāwhiti, Waikato and West Coast. Capital & Coast plans to develop the tools.

The TLG Programme Managers Working Group actively shares protocols and guidelines to encourage uptake by all DHBs.

In 2019
14 DHBs
provide training in VC

A comprehensive range of guidelines, regulations, standards and professional body guidance are available on the NZ Telehealth Resource Centre.

Telehealth Training

In 2019, 14 DHBs state they provide training in the use of video-conferencing facilities. This includes some DHBs that do not have telehealth programme managers/facilitators who typically fulfil this function. Instead, peers and super users with telehealth experience or IT technical resources provide the training. This question wasn't asked in in 2011 or 2014.

Telehealth Counting Methods

In July 2015, the Ministry of Health made the Mode of Delivery (MoD) code for DHBs to record the delivery of health care using telehealth mandatory. However, the quality of the reported data is unreliable. Some DHBs still do not use the field and for some of those that do there is uncertainty about which telehealth code to use.

In 2019, 11 DHBs report they have a method of counting, yet only nine say they use the MoD code: Auckland, Waitematā, Lakes, Waikato, Tairāwhiti, Hawke's Bay, MidCentral, Canterbury and Southern.

Reliable statistics are an important factor in measuring the uptake of telehealth. Reliable and readily available performance data can help evaluate the effectiveness of telehealth, including improving patient access, workforce effectiveness, reducing travel and accommodation costs for patients and clinicians, reducing non-attendances and reducing waiting lists. Reliable MoD statistics can also be used to inform business cases for investment in telehealth.

The TLG has reviewed the MoD coding definitions and work is under way with the DHBs to ensure that the use of the MoD increases and that the quality of reporting improves. The figure below shows current MoD definitions.

Figure 2: Mode of Delivery Codes and Definitions

Code	Type	Definition
1	*In Person (one patient to one clinician)*	Individual face to face at the same location. Where tests are performed the mode of delivery is face to face
2	*In Person (one patient to many clinicians)*	Multi disciplinary meeting with patient present at the same location and time
3	*In Person (one clinician to many patients)*	Group of patients being seen by one or more clinicians at the same location and time
4	*Remote patient monitoring*	Monitoring of patient's biometric health information communicated from a remote patient medical device
5	*Telephone*	Voice only contact between patient and clinician using telephone
6	*Videoconference*	Communication via technology enabling remote visual and audio contact between patient and clinician(s)
7	*Non-contact (virtual)*	An event where decisions about patient health care are made without the patient being present.

The current DHB status regarding counting methods is shown below.

Figure 3: Telehealth Consultations - Counting Methods in 2014 and 2019

Counting Methods	DHB Status
Do you have a method of counting telehealth consultations (scheduled or unscheduled)?	Four DHBs had a method of counting in 2014 (Auckland, Northland, MidCentral and West Coast.) Another four weren't sure. In 2019, 11 of the 19 DHBs using VC for patient consultations said they have a method of counting: Auckland, Canterbury, Lakes, MidCentral, Nelson Marlborough, Northland, Southern, Tairāwhiti, Waikato, Waitematā and West Coast.
If yes, do you use the Ministry of Health Telehealth Mode of Delivery Code?	Nine of the eleven DHBs who have a method of counting say they use the MoD code: Auckland, Waitematā, Lakes, Waikato, Tairāwhiti, Hawke's Bay, MidCentral, Canterbury and Southern. The methods of counting vary even within DHBs; for example, Northland uses the MoD code for counting telehealth in outpatient clinics, yet most of their Mental Health use isn't captured using the MoD code.
Is the telehealth appointment code entered in your patient management system?	In 2019, the 11 DHBs who have a method of counting enter the appointment code in their Patient Management System: Auckland, Northland, Waitematā, Lakes, Waikato, MidCentral, Canterbury, Nelson Marlborough, Southern, Tairāwhiti and West Coast. The involvement of two locations and possibly two DHBs requires additional procedures to avoid double counting and to integrate with financial accounting (for example, the handling of inter-district flows).

The figure below shows indidivual DHB governance reponses.

Figure 4: Telehealth Governance – 2019 DHB Responses

		Resources		Investment / Oversight		Delivery		
		Clinical Lead?	Program Manager?	Strategy?	Governance Group?	Protocols & Guidelines?	Training?	Counting Method ?
Region	DHB	2019	2019	2019	2019	2019	2019	2019
Northern	Auckland	*At service Level*	✓	Regional	✓	✓	✓	✓
	Counties Manukau	✓	✓	Regional	✓	✗	✗	✗
	Northland	✓	✓	Regional	✓	✓	✓	✓
	Waitemata	✓	✓	Regional	✓	✓	✓	✓
Midland	Bay of Plenty	✗	✓	Regional	✗	✗	✓	✗
	Lakes	✓	✓	Regional	✓	✓	✓	✓
	Tairawhiti	*Informal*	✓	Regional	✓	✓	✓	✓
	Taranaki	✗	✗	Regional	✓	✗	✗	✗
	Waikato	✓	✓	Regional	✗	✓	✓	✓
Central	Capital & Coast	*In progress*	*In progress*	*In progress*	✓	*Planned*	*Planned*	✗
	Hawkes Bay	✗	✗	✗	✓	✗	✓	✗
	Hutt Valley	✗	✗	✗	✗	✗	✗	✗
	MidCentral	✓	✗	✓	✓	✗	✓	✓
	Wairarapa	✗	✗	✗	✗	✗	✗	✗
	Whanganui	✗	✗	✗	✗	✗	✗	✗
Southern	Canterbury	✓	✓	Regional	✗	✓	✓	✓
	Nelson-Marlborough	✓	✓	Regional	✗	✗	✓	✓
	South Canterbury	✗	✗	Regional	✗	✗	✓	✗
	Southern	✓	✓	Regional	✓	✗	✓	✓
	West Coast	✓	✓	Regional	✗	✗	✓	✓
Total Yes / Regional		**10**	**12**	**15**	**11**	**7**	**14**	**11**

3. Telehealth benefits

Clinical services in the DHBs were asked their views on telehealth benefits. There was a substantial response covering 337 clinical services across 18 DHBs. The majority said they realised or exceeded their anticipated benefits, especially for patients.

This section includes the highlights of that feedback. For a full list of comments, see Appendix 1. This will be a useful resource since it came from DHB staff members involved in delivering and planning telehealth services and supports the widely recognised benefits of telehealth.

▸ Value in telehealth?

The responses aligned with one or more of the following internationally recognised values/benefits delivered by telehealth:

- reduction in travel time and costs for patients and clinicians (this was the most frequently cited benefit), along with a reduction in national travel assistance claims
- improved access for patients (equity and convenience)
- increased opportunities for clinician collaboration with patients and other clinicians
- efficiency in the allocation of clinical resources
- ability to provide quality treatments (eg, use of video instead of just telephone)
- ability to see patients faster and reduce waiting lists
- avoiding hospital admissions and reducing did not attends (DNAs)
- improving staff safety by reducing risks associated with clinicians travelling (eg, when seeing patients in prisons)
- upskilling of staff.

In the Far North of NZ telehealth has huge benefits to the patients. A well planned and run telehealth clinic can save lengthy travel to base hospital services whilst still attending to their health care needs. In an area of geographic isolation and economic deprivation this is a valuable way to access secondary services. **- CLINICIAN COMMENT**

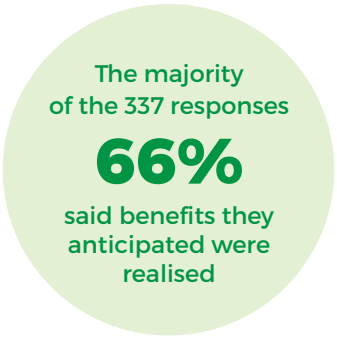
Examples of individuals comments on the value of telehealth are:

- Huge untapped potential. Overcomes geographic separation.
- It is advantageous, convenient, care delivered closer to home for patients. Allows more new and complex patients to be seen. Decreases waiting lists.
- Being able to work regionally without requiring the patient to travel. Being able to share knowledge with regional colleagues.
- Huge value in being able to see patients at their venue of choice and reduce travelling time for clinician.

- Improves efficiencies in delivery of care but still provides patients with the expertise they require for the management of their cancer.
- Very powerful for Radiology. Teleradiology allows off site reporting for efficiency, productivity and after-hours cover.
- Reduced stress and trauma for the client. More efficient use of time for clinicians which can be invested in patient care. Considerable reduction in travel costs.
- Extremely valuable. The work to support chronic and complex patients, particularly in more rural and remote mid and far north areas, to remain at home, to prevent ED admissions and to support general practice to lead community-based care coordination through MDT Meetings would not be possible in Northland without the flexibility of telehealth options.
- Huge value in time saving and adding value to the cost of highly paid clinicians. Additional benefits are earlier responses to patients and reduced waiting times. Also reducing the risks associated with clinicians travelling.
- Very valuable. It enables a room full of experts to work together to put best treatment plans in place for individuals which reduces appointments and speeds up treatment.
- It was great as I was able to answer questions as they came up and to provide more frequent support. Symptoms were tracked and parents could also take photos and it was all linked to their electronic medical record on the system. It reduced the cost for clinicians as well as reduced travel time between GPs and cost of clinic rooms. It also improved patient outcomes.
- Provides reliable service as not weather dependent.
- Has potential to maximize effective use of time for clinicians and service users by reducing travelling - could also empower and enable access for remote service users and whānau. Major advantages in assisting with equity.

▸ Benefits anticipated and realised?

The majority of the 337 responses (66 percent) said that the benefits they anticipated were realised, especially for the patient, or even exceeded.



- Anecdotally yes, food for thought at nutting out the concrete benefit of using telehealth. I suspect that the benefits are obvious but would need to audit our uses to quantify.
- Benefits for the complex clients have been great for providing wrap around services to ensure they remain where they want to be.
- Great for follow-up appointments when the client already knows the team they work with.
- Lots of unrealised potential in our service.

A few respondents (4 percent) qualified their achievement of the benefits.

- Yes, but could be better.
- Use of video link is better than phone or no contact but is not as good as in person. If the limitations are recognised and worked around it is useful.
- We still have to get all clinicians to buy in for the full benefit to be realised.

A few (9 percent) said the benefits hadn't been realised, primarily due to resistance or under-utilisation.

- Clinician reluctance to use with crisis patients is the main barrier.
- Uptake has been slower than anticipated.

- Trial suggested higher utilisation of best practice pathways.
- Telehealth has application for use in courts which is massively under-utilised.
- There is still resistance to the use of telehealth by many senior medical staff.

Approximately 19 percent of responses said that it was too early to tell, but many said that early indications were positive. A small number (3 percent) were unsure.

▸ Unexpected benefits?

Respondents gave many examples of unanticipated benefits.

- Telehealth clinic appointments are making our clinic infection control easier to manage. There are cross infection risks between people with Cystic Fibrosis that require "stand down" times before other CF patients can be seen in the same room. Joint VC clinics with other regional providers are strengthening networks and up-skilling them also.
- Patients see a consultant at every telehealth clinic appointment and are always supported by a nurse. This doesn't always happen in routine in-person clinics. Clinics also run much more to time.
- Follow-up of patient results and on-referral for treatment and advice is timelier. The appointments take less time and we have been able to see more people than in an in-person clinic.
- Safety of staff is improved when assessing prisoners with a high risk of violence has been a much larger driver for use than we would have thought.
- There is greater willingness for clients to accept going before the Judge.
- Respect and understanding of the interdisciplinary team roles.
- The time and energy saved in not having to travel or transport people enables me to attend all sorts of education, supervision and meetings I wouldn't otherwise be able to.
- Being able to visually see colleagues in the rural centres creates a much better understanding of our problems and creates a familiarity between individuals.
- Patients who are engaged with service are willing to have more regular clinical appointments via teleconference.
- Other nurses get to learn about this speciality.

▸ Unintended consequences?

Very few comments were cautionary or negative but are important to acknowledge. Most were in the technical / equipment category and are referenced in Section 4 Barriers. Other examples are:

- Over sold. Cannot beat one on one (in person) patient interaction. Good if no alternative.
- A poor replacement for (in person) but occasionally invaluable. I'm not sure for our services a phone call wouldn't suffice. What value does seeing someone's face put on the transaction?
- Not able to see patient Blood Gas results unless sent earlier.

- Over generalisation of benefits means management want to scale up before we are ready; administrative burden on the process while in these early stages; clinical records still send charts to outpatient clinics.
- It has allowed more remote working which has had a bit of a negative impact on the sense of 'team' in some areas.
- Some staff are more disengaged from meetings as a result of video conference (VC) and there are ongoing challenges with communication etiquette. There is an expectation that we shouldn't meet in person, decreasing its value, which in turn I feel leads to poor working relationships. Up-skilling packages are required to ensure existing workforce can keep up with the changes.
- Need to have appropriately trained staff supporting patients.

▸ Tracking Key Performance Indicators

Patient/client satisfaction surveys are the most commonly cited tracking activity. However, most respondents said they either weren't tracking key performance indicators (KPIs) or hadn't started yet. Some said they had tracked in pilot stages, but not as much in the business-as-usual environment. Others indicated that tracking should be done and two respondents said they lacked the budget and resources.

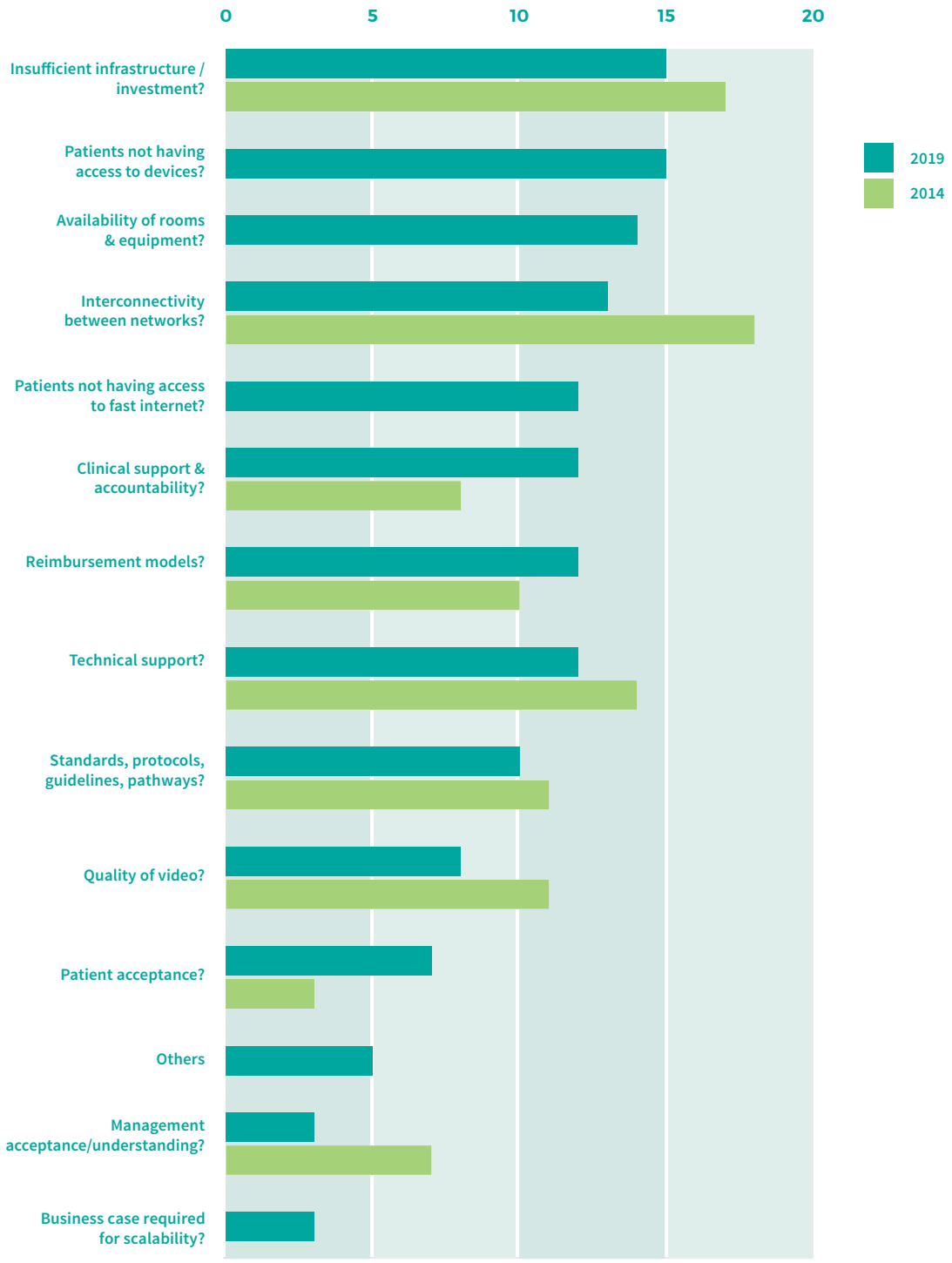
Respondents also submitted the following comments:

- Our draft pilot measures include but are not limited to, the range of care provided by professionals participating in primary care led MDTs, audit of MDT meeting outcomes including use of and adherence to MDT meeting protocol (applicable to Zoom based meetings), patient and provider satisfaction (Northland DHB).
- Long term measures will include patients with chronic complex conditions that are at risk of hospitalisation, who have been kept out of hospital, well and at home (Northland DHB).
- We are following up patient satisfaction, clinician satisfaction, throughput numbers, decline rates, technology issues. No financial KPIs as yet. Will look at patient savings (Waitematā DHB ENT).
- We are tracking numbers, patient and clinician experience and DNAs (Waitematā DHB Physiotherapy).
- Service quality for teleradiology is being tracked (Nelson Marlborough DHB).
- We aren't tracking formally, but clearly the cost savings are significant in situations where a consultant (and second clinician) does not need to spend a day per week travelling from the Far North to Whangarei for Family Court hearings (Northland DHB Mental Health).
- Tracking is done by a Benefits Manager (Counties Manukau DHB Healthy Together Technology).

4. Barriers to uptake of telehealth

DHBs were asked about barriers to the uptake of telehealth. Some new barriers emerged in 2019 and six of the nine barriers cited in 2014 had improved. See rankings and comparisons in the figure below.

Figure 5: Barriers to Uptake – Rankings in 2019 and 2014



The biggest barriers in 2019 were insufficient infrastructure/investment and patients not having access to devices (both cited by 15 DHBs), followed by the availability of rooms and equipment (14 DHBs) and interconnectivity between networks (13 DHBs).

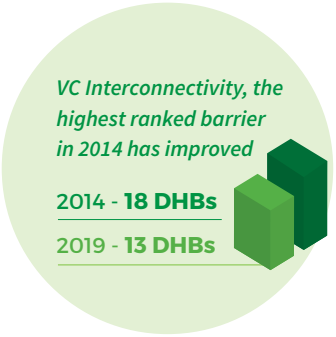
Twelve DHBs cited patients' access to fast internet, lack of clinical support and accountability, insufficient technical support and limited understanding of reimbursement models as barriers. Ten cited lack of standards, protocols and guidelines; eight cited quality of video; and seven cited patient acceptance.

Three DHBs cited management acceptance/understanding and business cases required for scalability as barriers.

The barriers were grouped into four categories: technical/equipment, governance, clinical and patient.

Technical/Equipment Barriers

Video conferencing interconnectivity with other networks was ranked the highest barrier in 2014, cited by 18 DHBs, while in 2019 13 DHBs reported this barrier. The quality of video as a barrier also decreased from 11 to 8 DHBs. While lack of infrastructure/investment has reduced it remains high with 15 DHBs citing it. Lack of technical support is also still a barrier for 12 DHBs.



Fourteen DHBs cited availability of rooms and equipment as a barrier. As the survey identifies a growing demand for telehealth services, this is a real concern. Although software solutions will alleviate the pressure to some extent, the expected increase in use will put pressure on already constrained telehealth resources.

Governance Barriers

There has been a welcome improvement in management understanding and acceptance of telehealth with only three DHBs reporting this as a barrier (compared to seven in 2014). However, the debate around reimbursement models for telehealth services has not been resolved. Twelve DHBs now cite it as a barrier, up from ten in 2014.

Telehealth is now fully understood at the executive level, but it now requires leadership at service level.

Clinical Barriers

While many more clinicians use or plan to use telehealth, significant barriers to clinical uptake remain and in some instances have increased since 2014. Twelve DHBs reported that clinical support and concerns about clinical accountability was a barrier, an increase from eight in 2014. This may reflect the champion-led nature of telehealth and the absence of clinical leaders in some DHBs. The challenge is not in finding early adopters, rather it is the challenge of getting widespread uptake across clinical disciplines.

Some DHBs report success with engaging clinical teams during pilot projects, while others report that it remains difficult to get clinical staff to use telehealth for patient consultations. The lack of standards, protocols and guidelines is still a barrier for 10 DHBs, reduced only slightly from 11 in 2014.

Patient Barriers

There was a surprising increase in DHBs reporting perceived patient unwillingness to participate in VC, from three in 2014 to seven in 2019. However, the reported frequency of this was very low and is counter to the very strong acceptance reported from patients in other qualitative feedback and individual DHB surveys. Yet it does indicate that some patients will be reluctant to substitute an in-person visit with a face-to-face telehealth consultation.

The survey indicates that telehealth is fast expanding to patients at home or work. Two new questions in 2019 highlighted barriers emerging related to this. Fifteen DHBs reported that patients not having access to a device was a barrier and 12 DHBs reported patients not having fast internet was a barrier. The focus on closer-to-home means that these barriers need to be managed to ensure equity of access, especially since some of the patients who would benefit most from telehealth are least equipped to access it.

Northland DHB did an independent survey and estimated that 60 to 85 percent of patients can access technology and internet however, access varies by speciality and some of the most disadvantaged groups have the lowest access.

▸ Issues / barriers cited by individual clinical services

Clinical services were also asked: 'what issues/barriers are limiting your service/profession in the use of telehealth, and what is needed to overcome these barriers?'

Over 200 free text responses were received. Most related to technical/equipment barriers, followed by clinical and governance, with only a few related to patients and other. For the full set of comments, see Appendix 2.

- What is needed: a road map for telehealth as part of the DHB strategy, device management as part of the system wide roll out, upgrading to sophisticated mobile devices, e.g. smart phones with high spec operating systems and more memory, staff training and coordinated approach for ongoing development with technologies.
- It would be great to have a better room for telehealth and to have a VC that can catch the details in a better way. It is frustrating when in a true emergency we have issues with telehealth and the other side cannot hear or see properly.
- Some patients are not suitable for telehealth appointments as they need physical assessments a nurse may not be able to provide. We would need to engage with medical team at the home DHB to determine if they would be willing to be involved in clinics to examine the patient on our behalf.
- As telehealth is becoming more popular the use of our dedicated VC equipment for these clinics is getting more booked up. We need to invest in alternatives such as Zoom via laptop with camera if we are to expand service.
- Our DHB has chosen Zoom as a platform which requires duplicate scheduling, once in our patient admin system and once in Zoom. There has been resistance from schedulers to take on this extra work.
- Need to access the correct supports in the community for the client to be supported before, during and after the appointment.
- Access to adequate internet in hospital and in peripheral centres. Restrictive policies on use of devices and software. Excessive fear regarding confidentiality.

- Seamless linking between platforms. Easy understanding of the new computer-based options e.g. Zoom, Real Presence. Consistency about options as there is such a broad range, for example can you Zoom, can you Skype, can you video chat on your phone. Too many options are paralysing especially when they don't link well!
- Availability of units in tertiary DHB (for links with rural hospital). Technophobes.
- Physical environments, level of availability and or sharing. Biggest challenge to full use of electronic transmission is alignment with privacy code and sharing patient information electronically.
- Judges are reluctant to use video conference for mental health court sessions, and it can be difficult getting them to agree for young people to attend via audio visual link (AVL) for criminal court. This means that some kids may miss out because they're too risky to leave the building but should still be afforded due process in my view.
- Improved access on laptops to enable access to patients in times that they are available. Currently it is a mission to find a suitable log-in and available "room" to book. Currently, access is limited by licence availability.
- Frustration at poor technology and infrastructure in DHBs. In private practice I was pleasantly surprised at how personal the appointment was and the easy use of diagrams and other aids. Patients access the App with relative ease.
- For some types of therapy (voice) at times in-person is superior depending on sound quality and recording equipment.
- Seem to always delay start of meeting due to connection issues.
- Difficulty with a lag in the video feed.

Above: Dr Ruth Large in a telehealth consultation with a specialist who is supporting the local Thames Hospital team during an emergency.

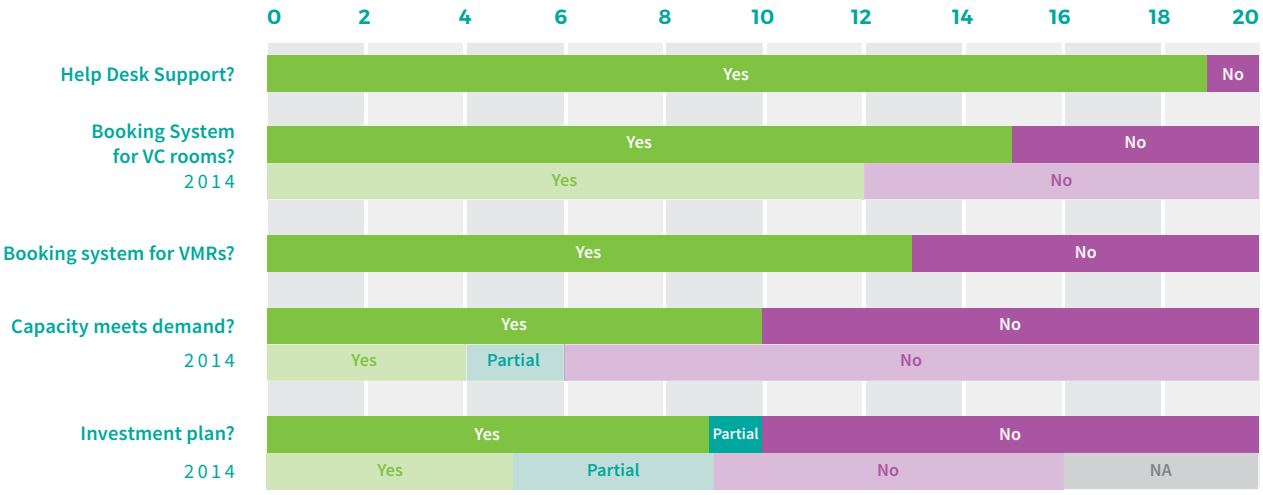
5. Videoconferencing infrastructure

The survey included questions on key factors in the DHB videoconferencing infrastructure, including capacity, support, hardware and software.

▸ Videoconferencing environment

There was a notable improvement between 2014 and 2019, with 10 DHBs reporting that their videoconferencing capacity meets demand (up from four in 2014), 15 having centralised booking systems for VC rooms (up from 12) and nine having investment plans for VC infrastructure (up from five). In 2019, 19 DHBs provided help desk support and 13 had booking systems for Virtual Meeting Rooms (VMRs).

Figure 6: VC Environment – Summary 2014 and 2019



Capacity

In 2014, only four DHBs said they had enough capacity to meet the demand for telehealth. Now half the DHBs report their VC capacity meets current demand.

However, as indicated in the responses on barriers, capacity is clearly still a substantial challenge. Half the DHBs reported that capacity is insufficient to meet current demands, let alone meet the forecasted increase in telehealth services.

Several DHBs have implemented lower-cost software-based VC solutions and DHBs report this has dramatically increased both their ability to deploy VC and the uptake by all users, including clinicians. Software solutions allow DHBs to allocate the use of hardware-based solutions for complex uses such as multi-disciplinary meetings (MDMs), frontline clinical applications and larger meetings. Other uses such as small administration meetings and point-to-point consultations are being moved to software solutions.

Investment plan

In 2014 there was minimal focus on coordinated and planned investment to meet unmet demand for telehealth. Only five DHBs reported having an investment plan and some were developing plans.

In 2019 nine DHBs have an investment plan to meet current unmet demand and future growth. This is a step forward. Yet, with over half the DHBs not having a specific plan, more needs to be done to meet current and future demand.

Booking systems

Fifteen DHBs reported having some form of centralised system for booking video conference equipment and rooms, up from twelve in 2014.

The majority of DHBs use Outlook, especially for fixed units in general-use meeting rooms. Some DHBs have IT or the facility's administration manage these bookings. Units in clinical areas are often managed and booked by the service where they are located.

Help desk support

Strong help desk support is important for user satisfaction. Nineteen DHBs provide help desk support. Some provide this through their IT departments or the Telehealth Project Facilitator (Canterbury DHB). Others have front line help desk support provided by service suppliers such as Vivid or NZ Connect/Zoom.

Although many help desks are not located onsite, most modern hardware and software allows for comprehensive remote support through management portals. There has also been a noticeable increase in the usability of VC platforms, minimizing (though not eliminating) the need for onsite help desk support.

The following figure shows the DHB responses for 2019.

Figure 7: VC Environment – DHB Responses 2019

		Capacity meets demand?	Investment plan?	Booking system for VC rooms?	Booking system for VMRs?	Help Desk support?
Region	**DHB**	**2019**	**2019**	**2019**	**2019**	**2019**
Northern	Auckland	✗	✓	✗	✗	✓
	Counties Manukau	✓	✓	✗	✓	✓
	Northland	✓	✓	✓	✓	✓
	Waitematā	✓	✗	✓	✓	✓
Midland	Bay of Plenty	✗	✓	✓	✗	✓
	Lakes	✓	✓	✓	✗	✓
	Tairāwhiti	✓	✗	✓	✓	✓
	Taranaki	✓	✗	✓	✓	✓
	Waikato	✗	✗	✓	✓	✓
Central	Capital & Coast	✗	✓	✓	✓	✓
	Hawke's Bay	✗	✓	✗	✗	✓
	Hutt Valley	✗	✓	✓	✓	✓
	MidCentral	✗	✓	✗	✗	✓
	Wairarapa	✓	✗	✓	✗	✓
	Whanganui	✓	✗	✓	✗	✓
Southern	Canterbury	✓	*Partial*	✗	✓	✓
	Nelson Marlborough	✗	✗	✓	✓	✓
	South Canterbury	✓	✗	✓	✓	✗
	Southern	✗	✗	✓	✓	✓
	West Coast	✗	✗	✓	✓	✓
Total Yes		**10**	**9**	**15**	**13**	**19**

Compliance with HISO VC interoperability standards

There has been a marked increase in the number of DHBs reporting that they meet the HISO 10049.1:2014 Video Conferencing Interoperability Standard. In 2019, 17 DHBs reported compliance. In 2014 there was uncertainty around the interoperability standards and 14 DHBs reported they were 'unsure' if they met the standard.

Most modern video conferencing hardware can meet the required standards and most industry partners have put considerable resource into enabling connectivity and interoperability between providers. Because of this, the few DHBs that say they are non-compliant likely do meet the standards.

▸ Hardware solutions

Figure 8: VC Infrastructure – 2019 Hardware Service Providers

Region	DHB	Vivid (Polycom)	Spark (Cisco)	Own Infrastructure	DiData (Cisco)	Spark (Polycom)
Northern	Auckland	✓				
	Counties Manukau	✓				
	Northland	✓				
	Waitematā	✓				
Midland	Bay of Plenty		✓			
	Lakes			✓		
	Tairāwhiti	✓	✓	✓		✓
	Taranaki	✓	✓		✓	
	Waikato			✓	✓	
Central	Capital & Coast	✓	✓			
	Hawke's Bay	✓	✓	✓		
	Hutt Valley	✓	✓			
	MidCentral	✓	✓		✓	
	Wairarapa	✓	✓			
	Whanganui	✓		✓		✓
Southern	Canterbury	✓				
	Nelson Marlborough	✓				
	South Canterbury	✓		✓		
	Southern	✓				
	West Coast	✓				
TOTAL		**17**	**8**	**6**	**3**	**2**

The implementation and maintenance of VC hardware can bring large capital and monthly licensing costs. As a result, and with the advent of newer options in the market, most DHBs say they are looking to augment hardware with software solutions and increase use of existing hardware rather than purchase more.

In 2014, Vivid Solutions was the sole provider of VC hardware in the Northern Region and the dominant/legacy provider in the other three regions. Gen-I was also introduced into the Midland, Central and Southern Regions, primarily for the Cancer networks. Midland Region had also implemented Dimension Data's solution as an in-house managed service solution.

Vivid Solutions remained one of the largest suppliers of hardware infrastructure in 2019, with 17 DHBs having Vivid Polycom units. Seven DHBs are major users: Canterbury, West Coast, Nelson Marlborough, Northland, Auckland, Waitematā and Counties Manukau. Southern DHB uses Vivid Polycom for MDMs and another provider for all other VC services.

Cisco has also become a major hardware solution, reportedly used by 10 DHBs. Spark and Dimension Data are two large providers of Cisco equipment and services. Waikato DHB and the Midlands region use Cisco and manage most of their hardware, along with using the HealthShare VMRs and Gateway.

▸ Clinical carts

The number of hardware-based clinical carts remains small, with around 10 carts reported nationwide. Northland, Lakes, Taranaki, Waikato, Canterbury and Nelson Marlborough use the carts.

Clinical carts like those deployed for telestroke at Nelson Marlborough continue to use hardware codecs. Others, such as the clinical cart in Northland, are being replaced with a software-based codec solution that has lower capital and operating costs.

Dr Teddy Wu of Canterbury DHB, and West Coast DHB stroke physician Dr Daniel Salazar.

▸ Software solutions

The following figure shows the videoconferencing service providers for software-based solutions in 2019.

Figure 9: VC Infrastructure – 2019 Software Service Providers

Region	DHB	Vivid (Polycom Real-presence)	Zoom.US (Zoom)	Connect NZ (Zoom)	Spark (Cisco Jabber)	Own Infra-structure	Own Infrastructure (Cisco Jabber)	Telesmart (Vidyo)
Northern	Auckland	✓		✓				
	Counties Manukau	✓		✓				
	Northland	✓		✓				
	Waitematā	✓	✓	✓				
Midland	Bay of Plenty		✓		✓			
	Lakes					✓	✓	
	Tairāwhiti	✓	✓	✓			✓	
	Taranaki		✓					
	Waikato					✓	✓	
Central	Capital & Coast	✓	✓		✓			
	Hawke's Bay	✓			✓	✓	✓	
	Hutt Valley	✓	✓		✓			
	MidCentral	✓	✓	✓	✓			
	Wairarapa	✓	✓	✓	✓			
	Whanganui			✓				
Southern	Canterbury	✓	✓					✓
	Nelson Marlborough	✓	✓			✓		
	South Canterbury	✓		✓				
	Southern	✓		✓				
	West Coast	✓						
TOTAL		**15**	**10**	**10**	**6**	**4**	**4**	**1**

We saw early signs of emerging software solutions in 2014, especially with Polycom Real Presence and Cisco Jabber. In 2019, the adoption of software solutions was widespread. Software solutions are being deployed across the spectrum of mobile, tablet, desktop and room-based solutions.

- There is such a wide range of solutions emerging in a dynamic environment that it is difficult to determine precise numbers of users and endpoints. However, the DHBs report that there are now thousands of video-capable users and endpoints nationwide. Polycom Real Presence, a leader in 2014, is still widely used and Vivid is a significant industry partner for many DHBs.
- Zoom has emerged as the tipping point for the deployment of software-based VC in New Zealand. Thirteen DHBs now use Zoom. The four Northern Region DHBs selected Zoom (via Connect NZ) through their shared IT service provider healthAlliance following a formal tender process and now use Zoom for the full range of telehealth interactions.
- Jabber and Jabber Guest is well supported (especially in Waikato) with over 1000 licences.
- Vidyo has been deployed at Southern DHB with over 300 licences. Currently no other DHBs report using this solution.
- Several DHBs reported using Skype or Skype for Business, predominantly for human resources and administrative purposes.

6. Telehealth promotion and evaluations

▸ DHB promotion and evaluation

In 2019, 10 DHBs reported that they have promoted telehealth applications and services via newsletters, websites and at events. This question wasn't asked in 2014.

In 2014, five DHBs reported having conducted formal/structured evaluations. In 2019, seven conducted evaluations.

Figure 10: Telehealth Promotion – DHB Responses 2019

		Promotion?	Evaluations?	
Region	**DHB**	**2018/19**	**2014**	**2018/19**
Northern	Auckland	✓	✓	✓
	Counties Manukau	✓	✗	✓
	Northland	✓	✓	✓
	Waitematā	✓	✗	✓
Midland	Bay of Plenty	✗	✓	✓
	Lakes	✗	✗	✗
	Tairāwhiti	✓	✗	✗
	Taranaki	✗	✗	✗
	Waikato	✓	✓	✓
Central	Capital & Coast	✓	✗	✗
	Hawke's Bay	✗	✗	✗
	Hutt Valley	✗	✗	✗
	MidCentral	✗	*In progress*	✗
	Wairarapa	✓	✗	✗
	Whanganui	✗	✗	✗
Southern	Canterbury	✓	✗	✗
	Nelson Marlborough	✗	✗	✗
	South Canterbury	✗	✗	✗
	Southern	✓	✗	✓
	West Coast	✓	✓	✗
Total Yes		**11**	**5**	**7**

7. NZ Telehealth Leadership Group support

▸ Purpose of the NZ Telehealth Leadership Group

The New Zealand Telehealth Leadership Group (NZTLG) is the key contact group that promotes and supports the uptake of telehealth/virtual health. It is made up of clinicians (primary and secondary care), policy makers, planning and funding managers, telehealth programme managers, ICT experts and industry representatives. The NZTLG delivers a work programme that includes:

- driving for interoperability and integration
- developing and implementing standards
- implementing a national videoconferencing directory
- advice and training for people wanting to set up a telehealth service
- advising on business case development
- maintaining the Telehealth Resource Centre
- sharing knowledge and successes.

The NZTLG has developed the New Zealand Telehealth Resource Centre in conjunction with Mobile Health to support the uptake of telehealth in New Zealand. The Telehealth Resource Centre is a one stop website that has guidance and resources for setting up or improving a telehealth service.

Ten DHBs reported using the TRC and found it a useful source of information. Ninety percent of visitors to the website found the information useful.

The DHBs indicated they wanted to see additional resources developed, most notably with guidelines (75 percent), case studies (70 percent) and industry presentations (70 percent).

Figure 11: NZ Telehealth Leadership Group Support – DHB Responses 2019

Region	DHB	Used TRC resources?	TRC useful?	Guidelines?	Internal presentations?	Industry presentations?	Case studies?	Advice?	Advocacy?
Northern	Auckland	✓	✓	✓	✓	✓	✓	✓	✓
	Counties Manukau	✗	✗	✓	✓	✓	✓	✓	✓
	Northland	✓	✓	✓	✓	✓	✓	✓	✓
	Waitematā	✗	✗	✗	✗	✗	✗	✗	✗
Midland	Bay of Plenty	✓	✓	*NA*	✗	✗	✗	✗	✗
	Lakes	✓	✗	✓	✗	✗	✗	✗	✗
	Tairāwhiti	✗	✗	✓	✓	✗	✗	✓	✓
	Taranaki	✗	✗	✓	✓	✓	✓	✓	✗
	Waikato	✓	✓	✗	✗	✗	✗	✗	✗
Central	Capital & Coast	✗	✗	✓	✓	✓	✓	✓	✓
	Hawke's Bay	✗	✗	✗	✗	✓	✓	✓	✓
	Hutt Valley	✗	✗	✓	✓	✓	✓	✓	✓
	MidCentral	✓	✓	✓	✓	✓	✓	✓	✓
	Wairarapa	✗	✗	✓	✓	✓	✓	✓	✗
	Whanganui	✗	✗	✓	✗	✓	✓	✗	✓
Southern	Canterbury	✓	✓	✓	✓	✓	✓	✗	✓
	Nelson Marlborough	✓	✓	✓	✗	✗	✓	✓	✓
	South Canterbury	✗	✗	✗	✗	✓	✗	✗	✗
	Southern	✓	✓	✓	✗	✓	✓	✓	✗
	West Coast	✓	✓	✓	✓	✓	✓	✗	✓
TOTAL		**10**	**9**	**15**	**11**	**14**	**14**	**12**	**12**

▸ How clinical services heard about telehealth

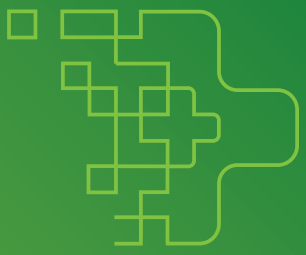
Clinical services have heard about telehealth from several sources:

- their current DHB where telehealth is used (their own department, IT department, telehealth programme manager, other specialty areas)
- former organisation(s) where they used it themselves
- colleagues from other DHBs already using it
- professional organisations, conferences, seminars, academia, journal articles and media.

Clinicians comments point to methods of promotion we can use to encourage further uptake of telehealth.

"Telehealth is an embedded, well utilised modality of delivering health care at the WCDHB"

- Telehealth has grown organically in the last decade or so. I first used it for MDMs in the mid- 2000s and I first encountered it as a regular means of patient assessment whilst living in British Columbia where the far-flung dispersal of the population makes regular in person consultations difficult.
- University, when studying undergraduate degree.
- Word of mouth and used it a lot in the UK.
- Presentation from HINZ and colleagues.
- Through my colleagues in haematology using it to solve a waiting list problem for follow-up patients at a regional clinic.
- More and more clinicians using it.
- Had seen media articles but mostly through our DHB Telehealth Project Manager.
- Through normal DHB processes (advertised on the intranet, advised as part of induction).
- Use it all the time and as a super user I often facilitate the use by other clinicians.
- Our DHB piloted a mobile device project. I am passionate about telehealth, am convenor of the Occupational Therapy NZ-Whakaora Ngangahay Aotearoa (OTNZ-WNA) special interest group for eHealth/Telehealth, attended HINZ in 2016 and the Allied Health component this year.
- We have been trying to use telehealth for some years as a result of some sound research that demonstrates the benefits.
- Telehealth is an embedded, well utilised modality of delivering health care at the West Coast DHB.
- It is a natural part of how we work here on West Coast - imperative to providing services over a large geographic area, and having some specialists based in the main centre across Southern Alps.



Part 2: Telehealth in clinical services

National view, interactions, clinical services using telehealth, other technologies

2

8. Telehealth clinical services – national view

This section presents survey findings regarding the clinical services use of telehealth technologies.

The results showed that in 2019 clinicians predominantly used video-based technologies.

The survey covered clinical services within five major categories: Adult and Women's Health, Allied Health, Ambulatory and Clinical, Mental Health and Paediatrics.

Responses covered 337 services from 18 DHBs. Respondents identified 1324 telehealth initiatives.

responses covered **337** services from **18 DHBs**

Delivery of health services to patients is a major focus. Telehealth use with patients present represented 30 percent of all active telehealth projects, the majority of these being follow-up appointments (16 percent) and first patient contacts (8 percent). Planned and pilot projects also reflect a focus on direct patient care, indicating this is a priority for DHBs. See Section 11 for more information on planned projects.

The use of telehealth for activities such as acute assessment is currently comparatively small (5 percent), yet the importance of the lower use categories cannot be overstated. Specific examples of acute care included acute mental health assessments, telestroke and paediatric critical care video links. Northland DHB, like many others, uses telehealth to assess acutely ill patients presenting to rural hospital EDs and assess suitability for helicopter transfer. They also use the video link to give advice to rural colleagues and to support the flight retrieval team with information for the patient transfer.

There is a lot of evidence that clinicians use telehealth to ensure they deliver the best possible patient care. Aside from education sessions (17 percent), clinicians also use telehealth for multi-disciplinary meetings (19 percent) and clinician-to-clinician links (17 percent).

Virtually all DHBs conduct multi-disciplinary meetings. Some have large lecture theatres with large screens or projectors, multiple cameras and video sources to show high quality pathology, medical imaging and other clinical information. See Section 12 for more detail.

Clinician-to-clinician links are also used for clinical discussions, for example in care planning.

▸ Response totals for departmental / specialty groups

The responses from each DHB and the numbers of responses for each major category of clinical services are shown on the next page.

Figure 12: Clinical Services Responses by Specialty for each DHB

		Adult & Women's Health	Allied Health	Ambulatory & Clinical	Mental Health	Paediatrics	Grand Total
Region	DHB	2019	2019	2019	2019	2019	2019
Northern	Auckland	5	3	1		3	12
	Counties Manukau	3		4			7
	Northland	19	1	4	4	6	34
	Waitematā	3	5		1	7	16
Midland	Bay of Plenty						0
	Lakes			3			3
	Tairāwhiti						0
	Taranaki		6	5	3		14
	Waikato	2	6	6	13		27
Central	Capital & Coast	1	13		7		21
	Hawke's Bay	1		4			5
	Hutt Valley		1				1
	MidCentral	2	7	6			15
	Wairarapa	2		2			4
	Whanganui	2	7		9	4	22
Southern	Canterbury	9	1	7	8		25
	Nelson Marlborough	17	5	5	15	1	43
	South Canterbury					3	3
	Southern			1	2		3
	West Coast	36	16	9	17	4	82
TOTAL		102	71	57	79	28	337

▸ Range of clinical services using videoconference (VC)

There has been a significant increase in the range of clinical services and the number of DHBs using VC for business-as-usual (active) clinical services. There are also a wide range of services in the pilot or planning stage.

- In 2014, 12 DHBs used or planned to use VC in approximately 55 services for clinician interactions (mainly MDMs) and patient-related interactions (mainly follow-up appointments and clinical imaging).
- In 2019, 18 DHBs reported either actively using VC, piloting or planning to use it in more than 75 services across the full range of interactions.

The figure below shows the full range of services within departmental/specialty groups for 2019. It includes both patient-related and clinician-only interactions.

Note: Several services were reported in more than one major category, perhaps due to different departmental structures across DHBs. For example, Audiology was reported in Ambulatory and Clinical by one DHB and in Allied Health by another DHB. General Surgery was reported in Adult & Women's Health by one DHB and in Ambulatory & Clinical by another. The duplicates are shown as reported, but the total number of generic specialties has been adjusted to 75.

Figure 13: Clinical Services Summary

Departmental/ Specialty Group	Services actively using, piloting and planning telehealth for patient and clinician interactions
Adult & Women's	Adult emergency, cardiology, ENT, gastroenterology, general medicine, general surgery, gerontology, gynaecology, haematology, infectious diseases, intensive care, neurology, neurosurgery, oncology, palliative care, renal, respiratory, urology, vascular surgery. Others included: dietetics, diabetes, cystic fibrosis, old persons' health, radiation oncology, rheumatology.
Allied Health	Audiology, cardiac physiology, counseling, hospital pharmacy, nutrition/dietetics, occupational therapy, physiotherapy, podiatry, psychology, social work, speech language. Others included: alcohol & other drug, child therapy, community dental/dental, genetic counselling, healthcare home, laboratory, medical clinic in concussion, medical, radiation therapy, radiology & labs, violence intervention programme, and wheelchair.
Ambulatory & Clinical	Audiology, dermatology, brain injury rehab, emergency dept (telestroke), endocrinology, general medicine, general surgery, haematology, medical oncology, memory, nephrology, older persons' health, renal, urology, sleep/respiratory, pain management.
Mental Health	Acute mental health inpatients, child adolescent & family, community and outpatient adult, crisis team, early intervention (in psychosis), eating disorders, forensic & rehabilitation, forensics & rehabilitation inpatients & community, intellectual disability, maori mental health, maternal mental health. Pasifika health, psychiatric liaison, psychogeriatrics. Other includes: community youth AOD, SMHS pools.
Paediatrics	General paediatrics, haematology & oncology, home health care, neonatal, nephrology, neurosurgery, paediatric diabetes, play services, respiratory, rheumatology.

▸ High frequency telehealth services

Of the 337 services reported by the 18 DHBs, the following were reported most frequently : community and outpatient mental health (17 respondents); oncology (15 respondents); occupational therapy (11 respondents); acute mental health inpatients (10 respondents); speech language (10 respondents).

Each service was asked to provide estimates of the frequency with which they used each type of telehealth interaction involving patients over the previous 6 months (first assessments, follow-ups, acute assessments, nurse clinics, remote monitoring), as well as for clinician-to-clinician (mainly MDMs) and clinical education sessions.

Not all services provided estimates and counting methods vary; however, the numbers are indicative of where the most activity takes place.

The most common use of VC for patient interactions continues to be for follow-up appointments, followed by first patient contacts and acute assessments.

Multi-disciplinary meetings continue to be the highest usage in the clinician and team sessions category, followed by clinician-to-clinician sessions and clinical education.

The tables below show the services that reported high numbers of telehealth interactions[2]

Adult and Women's Health

Oncology was the most frequent user of VC for patient consults in the adult and women's service, with 903 interactions in the previous 6 months, primarily for first patient contacts and follow-ups. Neurology followed with 172 interactions for acute assessments, then haematology with 131 for first patient contacts and follow-ups and cardiology with 146 for first patient contacts, follow-ups and nurse clinics.

Oncology was also the highest user for clinician and team sessions, with 839 interactions for clinical imaging, clinician-to-clinician, MDMs and education; followed by older persons' health with 400 for clinician-to-clinician and MDMs; and maternity with 550 for clinical images, MDMs and education.

Figure 14: High Frequency Services in previous six months – Adult and Women's Health

	Adult & Women's Health	Cardio-logy	ENT	General Surgery	Haema-tology	Neuro-logy	Oncology	Urology	Others - Maternity	Others - Older Persons' Health
Patient Contact	First Patient Contact	14	25	26	11		121	40		
	Follow up Appointment	71	40	43	120		776	120		
	Acute Assessment					172	5			
	Nurse Clinics	61		1			1			
	Remote Monitoring									
	TOTAL:	**146**	**65**	**70**	**131**	**172**	**903**	**160**		
Clinician / Teams	Case conference									
	Clinical Image	20					48		500	
	Clinical to Clinician	4		1	10		50			100
	Multi-disciplinary mtgs	4			46	2	368		10	300
	Education	2		1			373	5	40	
	TOTAL:	**30**	**0**	**2**	**56**	**2**	**839**	**5**	**550**	**400**

[2] *The Ambulatory and Clinical services category is not shown· Although quite a few services within this category indicated they were using VC (as shown in the Clinical Services Summary), few numbers were supplied·*

Allied Health

Speech language was a frequent user of VC for patient consults in allied health with 317 interactions for first patient contacts, follow-up appointments, group sessions and consults with patient present. Cardiac physiology also reported a high number (1200) for remote monitoring of patients.

Physiotherapy (126) and occupational therapy (62) were also high users for consults without patient present, multi-disciplinary meetings and education.

Figure 15: High Frequency Services in previous 6 months – Allied Health

	Allied Health	Cardiac Physiology	Nutrition / Dietetics	Occupational Therapy	Physio-therapy	Speech Language
Patient Contact Interaction	First Patient Contact		12	10	8	150
	Follow up Appointment		21	15	22	157
	Group Patient sessions		1			6
	Allied Health Consult (Patient present)				5	4
	Remote Monitoring	1200			8	
	TOTAL	**1200**	**34**	**25**	**43**	**317**
Clinician / Teams	Allied Health Consult (Patient not present)		12	23	25	3
	Multi-disciplinary mtgs	3	1	11	80	12
	Education		3	28	21	7
	TOTAL	**3**	**16**	**62**	**126**	**22**

Mental Health

Community and adult mental health outpatients service is the highest frequency user of VC for patient interactions in mental health with 624 sessions for first patient contact, follow-ups and acute assessments, followed by forensic and rehabilitation inpatients and community with 160 for first patient contact and follow-ups.

Community and adult mental health outpatients are also the highest users for clinician and team sessions with 825 for clinician-to-clinician, MDMs and education; followed by acute mental health inpatients with 235 sessions for clinician-to-clinician, MDMs and education; then the crisis team with 238 sessions for clinician-to-clinician, MDMs and education.

Figure 16: High Frequency Services in previous 6 months – Mental Health

	Mental Health	Acute Mental Health Inpatients	Community & Outpatient Mental Health Adult	Crisis Team	Forensic & Rehabilitation Inpatients & Community
Patient Contact	First Patient Contact		95	8	140
	Follow up Appointment	15	521	20	20
	Acute Assessment		8	6	
	Nurse Clinics				
	TOTAL:	**15**	**624**	**34**	**160**
Clinician / Teams	Clinical to Clinician	116	406	22	6
	Multi-disciplinary mtgs	104	206	116	23
	Education	15	213	100	10
	TOTAL:	**235**	**825**	**238**	**39**

Paediatrics

General paediatrics service is the biggest user of VC for patient interactions in paediatrics with 762 sessions for first patient contact, follow-ups and acute assessments; followed by child emergency with 220 sessions for first patient contact, follow-ups and acute assessments.

General paediatrics is also the highest frequency user for clinician and team sessions with 649 for clinical image, clinician-to-clinician, MDMs and education; followed by child emergency with 212 for clinical image, clinician-to-clinician and education.

Figure 17: High Frequency Services in previous 6 months – Paediatrics

	Paediatrics	Child Development	Child Emergency	General Paediatrics	Neonatal
Patient Contact	First Patient Contact	50	100	400	50
	Follow up Appointment	51	20	240	20
	Acute Assessment	50	100	122	55
	Remote Monitoring	60			
	TOTAL:	**211**	**220**	**762**	**125**
Clinician / Teams	Clinical Image		100	215	50
	Clinical to Clinician	63	100	237	36
	Multi-disciplinary mtgs	68		135	50
	Education	42	12	62	17
	TOTAL:	**173**	**212**	**649**	**153**

9. Telehealth interactions

▸ Growth of VC for telehealth patient / clinician interactions

The use of VC for patient and clinician/team interactions has grown considerably since 2014. This section summarises the changes. See Figure 8 below for the usage by type of interaction in each DHB.

Photo courtesy of the Waikato DHB

- VC usage for patient consultations has grown from 16 DHBs in 2014 to 19 in 2019. The growth is significant, not only in the number of DHBs, but also in the number of clinical services represented and the frequency of usage.
- In 2019 only 16 DHBs said they used VC for clinical education, yet in 2014 all DHBs except South Canterbury said they did. Four DHBs in the Central Region indicated they are not currently using VC for this purpose.
- Fifteen DHBs said they used VC for meetings with GPs and NGOs. (Question not asked in 2014).
- Seventeen DHBs used or planned to use VC for meetings with organisations outside the health sector. The organisation mentioned most was the Department of Justice and Courts, particularly for mental health. (Question not asked in 2014.) Canterbury DHB reported they are making their VC facilities available to other health organisations such as Insight, NZ Nurses Organisation and Plunket.
- All DHBs used VC for multi-disciplinary and team meetings in 2014 and still do in 2019. The number of clinical services using VC for this purpose has increased. See Section 12.
- In 2014, 10 DHBs said they used VC for a wide range of functions, such as discharge meetings, clinical supervision, bed capacity planning and interpreting services for the deaf. Now nearly all DHBs use VC for these purposes.
- The use of VC for administrative/management meetings has increased significantly in all DHBs since 2014. Many commented that demand for VC rooms for meetings exceeds supply.

Figure 18: VC Usage Types- DHB Responses 2014 and 2019[3]

		Pt consultations?		Clinical education?		GPs / NGOs?	Other orgs outside Health?
Region	**DHB**	**2014**	**2019**	**2014**	**2019**	**2019**	**2019**
Northern	Auckland	✓	✓	✓	✓	✓	✓
	Counties Manukau	✗	✓	✓	✓	✓	✓
	Northland	✓	✓	✓	✓	✓	✓
	Waitematā	✓	✓	✓	✓	✓	✓ *(plan)*
Midland	Bay of Plenty	✓	✓	✓	✓	✗	✗
	Lakes	✓	✓	✓	✓	✗	✓
	Tairāwhiti	✓	✓	✓	✓	✓	✗
	Taranaki	✗	✓	✓	✓	✓	✗
	Waikato	✓	✓	✓	✓	✓	✓
Central	Capital & Coast	✓	✓	✓	✗	✓	✓
	Hawke's Bay	✓	✓	✓	✗	✓	✓
	Hutt Valley	✓	✓	✓	✗	✓	✓
	MidCentral	✓	✓	✓	✓	✗	✓ *(plan)*
	Wairarapa	✓	✓	✓	✓	✓	✓
	Whanganui	✗	✓	✓	✗	✗	✓ *(plan)*
Southern	Canterbury	✓	✓	✓	✓	✓	✓
	Nelson Marlborough	✓	✓	✓	✓	✗	✓
	South Canterbury	✓	✗	✗	✓	✓	✓
	Southern	✗	✓	✓	✓	✓	✓ *(plan)*
	West Coast	✓	✓	✓	✓	✓	✓ *(plan)*
Total Yes		**16**	**19**	**19**	**16**	**15**	**17**

[3] *Several DHBs responded in the general organisation section of the survey that they were not using VC for patient consultations. But responses in the clinical services section indicated VC was being used. The responses have therefore been changed to 'yes' for Capital & Coast, Counties Manukau, Hutt Valley, Taranaki and Whanganui. The only DHB that reported not using VC for patient consultations currently is South Canterbury, though they reported using it for mental health services in 2014. The change may be due to the services not being represented in the current survey.*

▸ Types of telehealth interactions and implementation stages

The survey asked about the stage of implementation for each type of telehealth interaction.

Figure 19 below shows the status of patient contact and clinician/team interactions in DHBs in 2019. Each number represents how many services use VC and the stage of implementation they have reached. For example:

- 75 services said they planned to use VC for follow-up appointments
- 48 active services use VC for first patient contact.

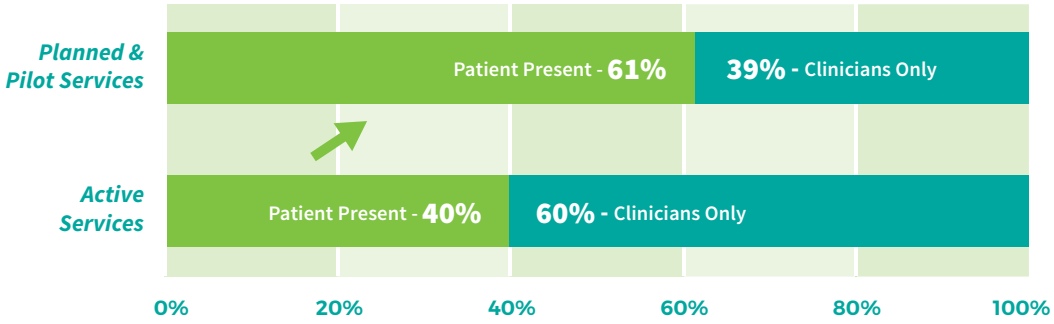
Figure 19: Clinical Services – Stages of Implementation

	Patient Present	Planned Services	Pilot Services	Active Services	Ended Services	Total
Follow-up Appointment	✓	75	10	97	7	189
First Patient Contact	✓	41	11	48	4	104
Nurse Clinics	✓	28	1	25	4	58
Remote Monitoring	✓	20	1	33	0	54
Acute Assessment	✓	13	4	31	1	49
Allied Health Consult - Patient present	✓	16	0	2	0	18
Group Patient Sessions	✓	7	2	1	0	10
Education	✗	41	2	101	6	150
Clinical to Clinician	✗	39	2	100	7	148
Multi-disciplinary meetings	✗	27	5	109	4	145
Clinical Image	✗	7	2	30	3	42
Allied Health Consult – Pt not present	✗	14	0	10	0	24
Case conference	✗	6	0	1	0	7

▸ Shift in focus on VC with patients

The majority (60%) of interactions in the currently active services are clinician to clinician and team sessions, with patients involved for 40%. However, the responses for pilots and planned telehealth services show a shift to patient involvement. The pilots and planned services shown patients involved in 61%. It is assumed that the frequency of all types of interactions will also increase as uptake across services increases, and that the shift in focus to patients will be even more significant.

Figure 20: Shift to Patient Involvement in VC



The percent of total consultations that are clinician-only (pictured at Northland DHB), will become less as the frequency of consultations with patients grows.

▸ Location of patients

The survey asked for the patient or other remote participants locations to be identified, and the stages of implementation. Location options were: DHB hospital home/work, primary health, aged care, and other.

The following figure shows responses for the patient locations for first patient contacts and follow up appointments across several stages of implementation: active, planned, pilot and ended.

Figure 21: Location of patients for first contacts and follow-ups

First Patient Contact	DHB Hospital	Home/ Work	Primary Health	Aged Care	Other
Active	26	1	5		
Planned	18	3	3		
Pilot	2	3	1		2
Ended	1	3			
Total	**47**	**10**	**9**	**0**	**2**

Follow-up Appointments	DHB Hospital	Home/ Work	Primary Health	Aged Care	Other
Active	54	5	9		1
Planned	29	13	7		
Pilot	3	5			1
Ended	3	2			
Total	**89**	**25**	**16**	**0**	**2**

Currently most patient contacts are from a main DHB hospital to another DHB facility, generally a rural hospital. Only 7 percent of the DHBs' follow-up appointments and less than 1 percent of first patient contacts are to a patient at their home or work.

the pilots and planned services show a clear shift to reaching the patient at home or work

However, the pilots and planned services show a clear shift to reaching the patient at home or work. Future plans show that 27 percent of follow-up appointments and 13 percent of first patient contacts will be with a patient at home or work. Most of the pilots that were reported are with patients at home or work.

The DHBs did not indicate any plans for linking to patients in aged care facilities, although we understand that the aged care sector is interested in using VC to link to DHBs as well as primary care.

10. Clinical services actively using telehealth

This section lists the clinical services actively using telehealth. Hardware and desktop software VC solutions are predominant, although the use of smartphones for video interactions with patients is growing.

The following tables show services by region and DHB within the major categories of adult and women's, allied health, ambulatory and clinical, mental health and paediatrics. The types of interactions for each service (both patient and clinician-only) are shown in brackets.

Note: We are aware that not all active services were reported, and in the time between the survey and this report, more services may have begun.

▸ Northern Region

Figure 22: Active Services – Northern Region

Northern DHBs	Active services reported for 2019
Auckland	**Adult & Women's Health** • Oncology (education, MDMs) • Radiation oncology (MDMs, education) **Allied Health** • Occupational therapy (education) **Ambulatory & Clinical** • Pain management (follow-ups, remote monitoring) **Paediatrics** • Play services - allied health (clinician-to-clinician, education) • Respiratory (education)
Counties Manukau	**Adult & Women's Health** • Community health service (clinician-to-clinician) • Diabetes (nurse clinics, education) • HTT/IT Projects (first patient contact, follow-ups, acute assessment, clinician-to-clinician, nurse clinics, MDMs, remote monitoring, education) **Ambulatory & Clinical** • Community health team (clinician-to-clinician, MDMs) • Memory team (clinician-to-clinician, MDMs) • Older people's health (clinical image, clinician-to-clinician, MDMs)

Continued on page 54

Continued from page 53

Northland	**Adult & Women's Health** • Adult emergency, cardiology, general medicine, general surgery, gerontology, gynaecology, haematology, infectious diseases, (all clinician-to-clinician and education) • Intensive care (acute assessment, clinician-to-clinician, MDMs) • Liver (clinician-to-clinician, education) • Oncology (clinician-to-clinician, education) • Palliative care (clinician-to-clinician, education) • Renal (first patient contact, follow-ups, clinical image, MDMs, remote monitoring, education, clinician-to-clinician) • Respiratory (clinician-to-clinician, education) • Rheumatology (follow-ups, nurse clinics, MDMs, education) **Ambulatory & Clinical** • Paediatric oncology (follow-ups, remote monitoring); • Paediatric general and paed diabetes (follow-ups, clinical image, remote monitoring); • Renal (follow-ups, nurse clinics, remote monitoring, education); • Rheumatology (follow-ups, clinical image, nurse clinics, MDMs, remote monitoring, education) **Mental Health:** • Acute mental health inpatients (clinician-to-clinician) • Community and outpatient mental health adult (follow-ups, clinician-to-clinician)
Waitematā	**Adult & Women's Health:** • Renal (MDMs) **Allied Health:** • Nutrition/dietetics (follow-ups) • Speech language (AH no-patient) • Community youth alcohol and drug service (follow-ups, clinician-to-clinician) **Paediatrics:** • Child development (clinician-to-clinician, MDMs, remote monitoring, education) • Home health care (MDMs) • Neonatal (MDMs)

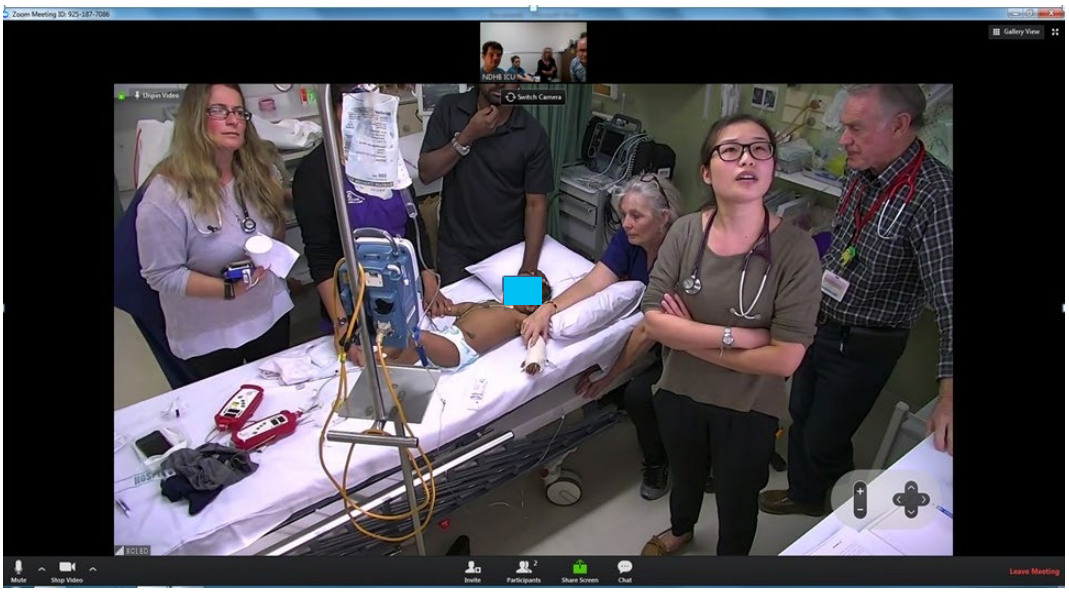


Photo courtesy Northland DHB

▸ Midland Region

Figure 23: Active Services – Midland Region

Midland Region DHBs	Active services reported for 2019
Bay of Plenty	Service details not reported
Lakes	**Ambulatory & Clinical** • follow-ups, acute assessment, clinician-to-clinician, nurse clinics, MDMs, education
Tairāwhiti	Service details not reported
Taranaki	**Ambulatory & Clinical** • Haematology (follow-ups, clinician-to-clinician) • Medical oncology (first pt contact, follow-ups) • Radiation oncology (first pt contact, follow-ups) **Mental Health** • Child, adolescent & family mental health (follow-ups, MDMs, education) • Community/outpatient mental health Adult (first patient contact, follow-ups, clinician-to-clinician, MDMs)
Waikato	**Allied Health:** • Occupational therapy (MDMs) • Physiotherapy (MDMs) • Psychology (first patient contact, follow-ups) • Speech language (case conference, MDMs) **Ambulatory & Clinical** • Dermatology (follow-ups, clinician-to-clinician, remote monitoring, education) • Endocrinology (follow-ups, clinician-to-clinician) • Haematology (follow-ups, clinician-to-clinician, remote monitoring) • Pain management (follow-ups) • Renal (follow-ups, clinician-to-clinician, remote monitoring) • Respiratory (follow-ups, clinician-to-clinician, remote monitoring) **Ambulatory & Clinical** • Community and adolescent MH (acute support)

▸ Central Region

Figure 24: Active Services – Central Region

Central Region DHBs	Active services reported for 2019
Capital & Coast	**Adult & Women's Health:** • Neurology (acute assessment) **Allied Health:** • Cardiac physiology (MDMs, remote monitoring) • Genetic counselling (MDMs, education) • Occupational therapy (AH no-patient, MDMs) • Wheelchair (AH no-patient) **Mental Health** • Child, adolescent & family mental health (clinician-to-clinician, MDMs, education) • Community and outpatient mental health adult (clinician-to-clinician, MDMs, education) • Director of training (education) • Forensic & rehabilitation inpatients & community (clinician-to-clinician, MDMs, education) • Intellectual disability (clinician-to-clinician, MDMs, education)
Hawke's Bay	**Ambulatory & Clinical:** • Haematology (follow-ups)
Hutt Valley	**Allied Health:** • Occupational therapy (first patient contact, follow-ups, AH no-patient, education)
MidCentral	**Adult & Women's Health** • Haematology (first patient contact, follow-ups, clinician-to-clinician, MDMs) • Oncology (first patient contact, follow-ups, clinician-to-clinician, education) **Allied Health:** • Podiatry (education)
Wairarapa	**Adult & Women's Health** • Adult emergency (acute assessment) • Urology (first patient contact, follow-ups, education)
Whanganui	**Mental Health:** • Child, adolescent & family mental health (clinician-to-clinician) • Maternal mental health (clinician-to-clinician, MDMs) • Psychogeriatrics (MDMs) **Paediatrics:** • Child development (first patient contact, follow-ups, acute assessment, clinical image, clinician-to-clinician, MDMs, education) • Child emergency (first patient contact, follow-ups, acute assessment, clinical image, clinician-to-clinician, MDMs, education) • General paediatrics (first patient contact, follow-ups, acute assessment, clinical image, clinician-to-clinician, MDMs, education) • Neonatal (first patient contact, follow-ups, acute assessment, clinical image, clinician-to-clinician, MDMs, education)

▸ Southern Region

Figure 25: Active Services – Southern Region

Central Region DHBs	Active services reported for 2019
Canterbury	**Adult & Women's Health:** • Cystic fibrosis service (follow-ups, acute assessment, clinical image, clinician-to-clinician, MDMs, remote monitoring) • General surgery (follow-ups, clinician-to-clinician, MDMs, education) • Gerontology (MDMs) • Older persons health (clinician-to-clinician, MDMs, education) • Oncology (first patient contact, follow-ups) • Palliative care (follow-ups, MDMs, education) • Respiratory (first patient contact, follow-ups, clinician-to-clinician, MDMs, education) • Rheumatology (follow-ups) **Ambulatory & Clinical** • Brain injury rehab service2 (clinical image, clinician-to-clinician, remote monitoring) • Community (MDMs, education) • Divisional management team (follow-ups, clinical image, clinician-to-clinician, MDMs, education) • Older persons health (follow-ups, clinician-to-clinician, MDMs, education) • Sleep/ respiratory (first patient contact, follow-ups, nurse clinics, MDMs, remote monitoring, education) • Spinal services (clinical image, clinician-to-clinician, remote monitoring) **Mental Health** • Acute mental health inpatients (clinician-to-clinician) • Community /outpatient mental health adult and crisis team (follow-ups, acute assessment) • Crisis team eating disorders (clinician-to-clinician, MDMs, education) • Forensic & rehabilitation inpatients & community (clinician-to-clinician)
Nelson Marlborough	**Adult & Women's Health** • Cardiology (first patient contact, follow-ups, clinical image, clinician-to-clinician, MDMs, education) • Gastroenterology (clinician-to-clinician, MDMs) • General medicine (remote monitoring, education) • Oncology (follow-ups) • Radiology (MDMs) • Respiratory (MDMs) **Allied Health** • Audiology (MDMs, education) • Occupational therapy (AH no-patient, education) • Physiotherapy (follow-ups, AH with patient, AH no-patient, MDMs) • Social work (AH no-patient, MDMs, education) • Speech language (AH with patient, education) **Ambulatory & Clinical:** • General medicine (clinical image) • Nephrology (clinical image) • Urology outpatients (follow-ups, clinical image, MDMs) **Mental Health** • Child, adolescent & family mental health (follow-ups, clinician-to-clinician, MDMs, education) • Crisis team (follow-ups) • Early intervention (In psychosis) (education) • Eating disorders (follow-ups, clinician-to-clinician, education) **Paediatrics** • General paediatrics (clinician-to-clinician, MDMs)

Continued from page 57

South Canterbury	**Paediatrics** • Gastroenterology (clinician-to-clinician, MDMs) • General paediatrics (clinician-to-clinician, MDMs, education) • Haematology & oncology (clinician-to-clinician, MDMs)
Southern	**Mental Health** • Community and outpatient mental health adult (first patient contact, follow-ups, acute assessment, MDMs) • Crisis team (follow-ups, clinician-to-clinician, MDMs, education)
West Coast	**Adult & Women's Health** • Cancer care new diagnosis (first patient contact, follow-ups, MDMs, education) • Gastroenterology (first patient contact, follow-ups, MDMs) • General surgery (first patient contact, follow-ups, clinician-to-clinician, MDMs, education, nurse clinics) • Gynaecology (MDMs) • Haematology (MDMs) • Neurosurgery (first patient contact, follow-ups) • Oncology (first patient contact, follow-ups, clinician-to-clinician, education, MDMs) • Paeds (first patient contact, follow-ups) • Plastics (first patient contact, follow-ups) • Primary care general practice (follow-ups, MDMs, education) • Respiratory (MDMs) • Urology (first patient contact, follow-ups, education) **Allied Health:** • Alcohol and other drug (first patient contact, MDMs, remote monitoring, education) • Laboratory (AH no-patient, MDMs, education) • Nutrition / dietetics (first patient contact, follow-ups, group patient session, AH no-patient, MDMs, education) **Ambulatory & Clinical:** • Clinical education (education) • Endocrinology (MDMs, remote monitoring, education) **Mental Health:** • Acute mental health inpatients (follow-ups, clinician-to-clinician, MDMs, education) • Community and outpatient mental health adult (follow-ups, clinician-to-clinician, nurse clinics, MDMs, education, acute assessment) • Crisis team (clinician-to-clinician, MDMs) • Eating disorders (clinician-to-clinician, education) • Psychiatric liaison (follow-ups, clinician-to-clinician, nurse clinics, MDMs, education) • Psychogeriatrics (follow-ups, clinician-to-clinician, MDMs) **Paediatrics:** • General paediatrics (follow-ups, acute assessment, clinical image, clinician-to-clinician, MDMs, education) • Neonatal (acute assessment, clinician-to-clinician, MDMs, education)

11. Clinical services – pilots, ended and planned

This section shows the telehealth activity in clinical services for pilots and services planned or ended.

Note: Some services that were reported could not be shown as the implementation stages were not provided.

▸ Pilots

Pilot activity has increased considerably with 11 DHBs reporting almost 30 pilots across all the major service categories. In 2014, only one pilot was reported, with Hawke's Bay trialling adult emergency support between Wairoa Hospital and Hastings Emergency Department.

Figure 26 shows the pilots reported for each DHB. The type of interaction is shown in brackets.

Figure 26: Pilots

Region	DHB	Pilots reported for 2019
Northern	Auckland	**Adult & Women's:** Oncology (clinical images) **Paediatrics:** Respiratory (clinician-to-clinician, MDMs)
	Counties Manukau	**Adult & Women's:** Community health service (MDMs) **Ambulatory & Clinical:** Memory team2 (clinical image); Radiology (first patient contact)
	Northland	**Adult & Women's:** MDMs
	Waitematā	**Adult & Women's:** ENT and diabetes (follow-ups), renal (clinician-to-clinician) **Allied Health:** Physiotherapy (first patient contact, follow-ups, remote monitoring); Speech language (follow-ups, consults patient present) **Mental Health:** Community youth AOD (first patient contact). Followups are currently active.
Midland	Taranaki	**Mental Health:** Child adolescent & family (first patient contact, acute assessment)
Central	Capital & Coast	**Allied Health:** Health care home with GP practice2 (MDMs); Medical clinic in concussion and speech language (group patient sessions)
	Whanganui	**Mental Health:** Eating disorders (MDMs)
Southern	Canterbury	**Adult & Women's:** Gerontology (follow-ups) **Allied Health:** Community dental (first patient contact, follow-ups, education) **Mental Health:** Forensic & rehabilitation inpatients & community (first patient contact, follow-ups, nurse clinics)
	Nelson Marlborough	**Adult & Women's:** Neurology (acute assessment) **Allied Health:** Physiotherapy (education)
	Southern	**Mental Health:** Crisis team (first patient contact, acute assessment). Follow-ups currently active.
	West Coast	**Adult & Women's:** Adult emergency (first patient contact) Greymouth & South Westland; Cardiology (first patient contact); Gynaecology (follow-ups); Haematology (first patient contact) **Mental Health:** Crisis team (follow-ups)

▸ Ended Services

Telehealth initiatives that have ended are shown in Figure 27.

Figure 27: Ended Services

Region	DHB	Pilots reported for 2019
Northern	Auckland	**Paediatrics/Allied Health** • Play services (MDMs)
	Waikato	**Allied Health** • Nutrition/dietetics (first patient contact, follow-ups, education) • Social work (education) • Speech language (first patient contact, follow-ups, education)
Central	Capital & Coast	**Allied Health** • Medical (first patient contact, follow-ups, MDMs). Temporary usage while medical specialist was in another region.
	Whanganui	**Adult & Women's** • Gynaecology (clinical image, clinician-to-clinician, MDMs) • Oncology (clinical image, clinician-to-clinician) **Mental Health** • Community and outpatient (clinician-to-clinician) • Mental health adult (clinician-to-clinician). Were using hMael with primary care. Primary care phone/virtual consultations continue.
Southern	Canterbury	**Adult & Women's** • Gerontology/older persons' health (clinical images) • Ambulatory & clinical • Older persons' health (first patient contact, follow-ups, clinician-to-clinician, education) • Spinal services (education) • Mental health • Intellectual disability (first patient contact, follow-ups, clinician-to-clinician, nurse clinics)
	Nelson Marlborough	**Adult & Women's** • Neurology (acute assessment, clinician-to-clinician) • Telestroke – DHB discontinued funding • Maternity (clinical image, MDMs, education) **Mental Health** • Community & outpatient MH adult (follow-ups). Follow-up used some years ago as a matter of necessity when medical cover was provided by Nelson clinician. Clinician-to-clinician available but rarely used.
	West Coast	**Adult & Women's** • Cardiology, oncology, palliative care – all at Fox Glacier (follow-ups, clinician-to-clinician, nurse clinics) • Ambulatory & clinical • Endocrinology at Greymouth (nurse clinics)

▸ Planned services

The 2019 survey shows that many services are planning to use telehealth.

- All eighteen of the DHBs that responded to this question said that new telehealth initiatives were planned, and cited the specific services, along with the types of interactions. Some services are just starting to use telehealth for patient and clinician interactions, others are planning to extend already active services.
- In 2014 fifteen DHBs said they were aware of plans for new patient-clinician telehealth services, but only three DHBs (Auckland, Bay of Plenty and Hawke's Bay) cited specific plans and all were for either follow-ups or acute assessments. Figures 28 to 31 below show services planned in each region and the types of interactions. [4]

Northern Region

Figure 28: Planned Services - Northern Region

Northern DHBs	New services planned
Auckland	"Many services are looking at modes of delivery to include telehealth now that we have tools in place, eg paediatrics and renal." **Adult & Women's:** Oncology (education); Vascular surgery (follow-ups, nurse clinics, remote monitoring) **Allied Health:** Radiation therapy (first patient contact); Speech language (follow-ups, consults, remote monitoring, initially for voice and head & neck cancer patients) **Paediatrics:** Paediatric rheumatology (clinician-to-clinician)
Counties Manukau	**Adult & Women's:** Community health (first contact, follow-ups, acute assessment, clinical image, nurse clinics, remote monitoring, education) **Ambulatory & Clinical:** Older persons (education)
Northland	**New services planned :** dental therapy clinics, general medicine, post surgical clinics to patients in the home, cardiology valve replacement clinics to patients in the home. **Allied Health:** Dental (follow-ups, patient consults) **Ambulatory & Clinical:** Paediatric general and paediatric diabetes (nurse clinics, education) **Mental Health:** Acute mental health inpatients (first contact, follow-ups) Community & outpatient adult (first contact, MDMs, education) Crisis team (first contact, follow-ups, clinician-to-clinician)
Waitematā	Currently in trial period with a view to scaling up to other services in 2019. **Allied Health:** Speech language (consults - patient present, MDMs); Physiotherapy (education) **Paediatrics:** Child development in hospital and community (first patient contact , follow-ups)

[4] *Some reported as planned may have since begun pilots or active services*

Midland Region

Figure 29: Planned Services - Midland Region

Midland DHBs	New services planned
Bay of Plenty	No report
Lakes	Planning to add more clinics
Tairāwhiti	No report
Taranaki	**Allied Health:** Nutrition/dietetics (follow-ups, consults, remote monitoring, education) ; Occupational therapy and physiotherapy (follow-ups, consults,education) ; Psychology (follow-ups, consults patient not present, education); Social work (consult patient not present, education); Speech language (follow-ups, consults, education) **Ambulatory & Clinical:** Emergency dept - telestroke service commencing November 2018 (acute assessment, clinician-to-clinician)
Waikato	Trialling Cisco Jabber which allows consults to patients directly. **Adult & Women's:** Gynaecology and obstetrics (first patient contact, follow-ups, MDMs) **Allied Health:** Nutrition/dietetics (group patient sessions, consults, case conferences , MDMs); Occupational therapy, physiotherapy, psychology (first patient contact, follow-ups, consults, case conferences); Speech language (group patient sessions, consults, case conferences)

Central Region

Figure 30: Planned Services - Central Region

Central DHBs	New services planned
Capital & Coast	**Allied Health:** Audiology (follow-ups); Occupational therapy (consults); Nutrition / dietetics (first patient contact, follow-ups, consults, case conferences, MDMs); Genetic counseling (first contact, follow-ups, group sessions); Speech language (first contact, follow-ups)
Hawke's Bay	Possibly between sites like Hastings to Wairoa, Hastings to Napier. At this stage a clinical person is always with the patient. **Adult & Women's:** Oncology and medical subspecialties (first patient contact, follow-ups, MDMs) **Ambulatory & Clinical:** Haematology (first patient contact, follow-ups, clinician-to-clinician)
Hutt Valley	**Allied Health:** Occupational therapy (consults patient present)
MidCentral	Several pilots planned to socialise and test with clinicians and patients / consumers / whānau. **Adult & Women's:** Haematology (education) **Ambulatory and Clinical:** Medical and surgical subspecialties (follow-ups, clinical images)
Wairarapa	**Ambulatory & Clinical:** Cancer (MDMs); P Cancer (first patient contact)
Whanganui	**Mental Health:** Acute MH inpatients, child adolescent & family MH and community and outpatient MH Adult (MDMs); Eating disorders (follow-ups, acute assessment, clinician-to-clinician, nurse clinics, MDMs, education); Forensic and rehabilitation inpatients & community (MDMs); All MH2 (follow-ups, acute assessment, clinician-to-clinician, nurse clinics, MDMs, education)

Southern Region

Figure 31: Planned Services - Southern Region

Southern DHBs	New services planned
Canterbury	**Adult & Women's:** Gerontology / older persons health (clinical images) **Ambulatory & Clinical:** Older persons health (first patient contact, follow-ups, clinician-to-clinician, education); Spinal services (education) **Mental Health:** Intellectual disability (first patient contact, follow-ups, clinician-to-clinician, nurse clinics)
Nelson Marlborough	Pilot from emergency to PHO urgent care centre for acute assessment. **Adult & Women's:** Adult emergency (acute assessment, remote monitoring); Cardiology (remote monitoring); General medicine (follow-ups); Infectious diseases (follow-ups) **Allied Health:** Speech language (follow-ups) **Ambulatory & Clinical:** General medicine (MDMs); GP links (all interactions) **Mental Health:** Plans for most types of interactions, varying across the services: Acute mental health, child, adolescent & family, community & outpt adult, crisis team, early intervention (in psychosis), eating disorders, intellectual disability, Māori mental health, psychiatric liaison, psychogeriatrics. **Paediatrics**: General paediatrics (first patient contact, follow-ups, remote monitoring, education)
South Canterbury	**Adult & Women's:** Respiratory (clinician-to-clinician)
Southern	New services planned: Pain, emergency with rural trust hospitals, respiratory, stomal, dermatology, expanding maternity delivery, expanding paediatrics.
West Coast	**Adult & Women's:** : ENT (follow-ups); Gynaecology (first patient contact, follow-ups, clinician-to-clinician); Haematology (follow-ups, clinician-to-clinician); Neurosurgery (clinician-to-clinician); Respiratory (first patient contacts, follow-ups); Urology (nurse clinics) **Ambulatory & Clinical:** Dermatology (follow-ups, nurse clinics); General surgery (first patient contact, follow-ups); Older persons health (MDMs); Oncology2 and rheumatology (follow-ups, clinician-to-clinician, nurse clinics) **Mental Health:** Psychogeriatrics (acute assessment, nurse clinics, remote monitoring) **Paediatrics:** General paediatrics (follow-ups, acute assessment, MDMs)

Some services, such as allied health and mental health plan to increase their use of telehealth. For example, Nelson Marlborough mental health teams use telehealth for education and follow-ups by the crisis team, but plan to extend use of telehealth in most mental health services for both patient and clinician interactions.

The planned growth in the use of telehealth will almost certainly require increased infrastructure to make services sustainable. Yet only 10 DHBs report they have enough capacity to meet the current demand. This includes:

- Videoconferencing capacity and facilities (hardware, software, rooms, booking systems)
- Human resources for planning, training and day-to-day support
- Interfaces with relevant clinical systems
- Overall governance with clinical leadership.

The DHBs responses show that they need more investment in people, processes and technology to prepare for coming demand. In some cases, this gap could discourage new initiatives.

12. Clinical services – multi-disciplinary meetings

▸ MDMs 2014 vs 2019

All 20 DHBs either used VC for multi-disciplinary meetings in 2014 or were in the process of setting up fit-for-purpose rooms for multi-site meetings. All DHBs continue to use VC for this purpose in 2019.

Not all DHBs currently have MDM Coordinators and MDM protocols. [5]

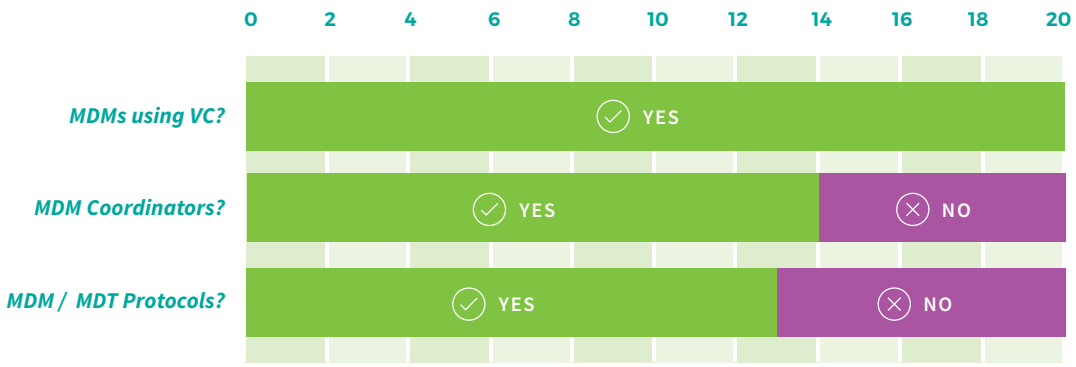
- Sixteen out of twenty DHBs had MDM coordinators in 2014, yet only 14 reported having coordinators in 2019.
- Nine of twenty DHBs had MDM protocols in 2014 and 13 DHBs had protocols in 2019. Although Hawke's Bay, Southern and West Coast were either developing or had protocols in 2014, they report not having them in 2019.

Figure 32: MDMs – DHB Responses 2014 and 2019

		MDM using VC?		MDM Co-Ordinators?		MDM / MDT Protocols?	
Region	**DHB**	**2014**	**2019**	**2014**	**2019**	**2014**	**2019**
Northern	Auckland	✓	✓	✓	✓	*Developing*	✓
	Counties Manukau	✓	✓	✓	✓	✗	✗
	Northland	✓	✓	✓	✓	✓	✓
	Waitematā	✓	✓	✓	✓	✗	✓
Midland	Bay of Plenty	✓	✓	✓	✓	✓	✓
	Lakes	✓	✓	✗	✓	✗	✓
	Tairāwhiti	✓	✓	✓	✓	✗	✓
	Taranaki	✓	✓	✓	✗	✗	✗
	Waikato	✓	✓	✓	✓	*Developing*	✓
Central	Capital & Coast	✓	✓	✓	✗	✓	✓
	Hawke's Bay	✓	✓	✓	✓	*Developing*	✗
	Hutt Valley	✓	✓	✓	✗	✓	✓
	MidCentral	✓	✓	✓	✓	✗	✓
	Wairarapa	✓	✓	✗	✗	✓	✓
	Whanganui	✓	✓	✗	✓	✓	✗
Southern	Canterbury	✓	✓	✓	✓	✓	✓
	Nelson Marlborough	✓	✓	✓	✓	✗	✓
	South Canterbury	✓	✓	✗	✗	✗	✗
	Southern	✓	✓	✓	✓	✓	✗
	West Coast	✓	✓	✓	✗	✓	✗
Total Yes		**20**	**20**	**16**	**14**	**9**	**13**

[5] *The terms multidisciplinary meetings (MDMs) and multidisciplinary team meetings (MDTs) are used interchangeably and can be confusing. This report assumes that the activity reported includes both and refers to multi-site meetings that may or may not use sophisticated integrated facilities for sharing case information, radiology and pathology images.*

Figure 33: MDMs - Summary 2019



▸ MDMs held in the Regions

MDMs and MDTs are common uses of videoconferencing facilities and in most cases require fit-for-purpose rooms and equipment. In the 6 months preceding the survey:

- MidCentral DHB reported 150 MDMs for Oncology
- Nelson Marlborough showed 96 MDMs for community and outpatient mental health adult and 50 for radiology (twice weekly at least)
- Canterbury DHB showed more than 500 MDMs for services including older persons' health, gerontology, oncology, eating disorders, palliative, respiratory and cystic fibrosis, an average of 20 per week.

A wide range of services use the facilities. Figures 34 to 37 below show the services that had active, planned and ended MDMs and those with coordinators. Contact information for coordinators is available on request.

Figure 34: MDMs – Northern Region 2019

DHB	MDMs with Co-ordinators	Other MDMs
Auckland	Has MDM coordinators, specialties not listed.	• Radiation oncology • Cancer and blood • Paediatrics • Oncology[6] • Respiratory (pilot) • Play services (ended)
Counties Manukau	• Cancer support • Galbraith infusion centre • Cancer • Primary & community	• HTT/IT projects • Community health • Memory team • Older peoples health
Northland	• Cancer and blood • Renal • Primary care	• Rheumatology • Renal • Intensive Care • Community & outpatient mental health adult (planned)
Waitematā	• Cancer	• Child development • Renal • Paediatric home health care • Neonatal • Speech language (planned)

Figure 35: MDMs - Midland Region 2019

DHB	MDMs with Co-ordinators	Other MDMs
Bay of Plenty	None reported	None reported
Lakes	• Cancer	Multiple MDMs
Tairawhiti	None reported	None reported
Taranaki	None reported	• Community & outpatient mental health adult • Child adolescent & family mental health
Waikato	• Chest • G.I. • Oncology • Head and neck • Lymphoma	• Nutrition / dietetics (planned) • Occupational therapy • Speech language • Psychology (planned) • Social work (planned) • Gynaecology (planned • Obstetrics (planned)

[6]Oncology was on the generic specialty list in the survey. Respondent commented 'Oncology is not a specialty, as per MCNZ'.

Figure 36: MDMs – Central Region 2019

DHB	MDMs with Co-ordinators	Other MDMs
Capital & Coast	None reported	• Genetic counseling • Child adolescent & family mental health • Forensic & rehabilitation inpatients & community • Wheelchair • Nutrition /dietetics • Cardiac physiology • Medical ended • Healthcare home with GPO practice2 (pilot)
Hawke's Bay	• Maternity • Radiology	• Oncology & medical subspecialties (planned) • Ambulatory & clinical, haematology
Hutt Valley	None reported	None reported
MidCentral	• Oncology (two co-ordinators) • Mental health	• Haematology
Wairarapa	None reported	• Cancer • Child development • Paediatric home health care • Neonatal
Whanganui	Via regional services	• Child development • Child emergency • General paediatrics • Neonatal • Acute mental health inpatients • Gynaecology (ended) • Child adolescent & family mental health (planned) • Community & outpatient mental health adult (planned) • Eating disorders (pilot) • Forensic & rehabilitation inpatients & community (planned)

Figure 37: MDMs – Southern Region 2019

DHB	MDMs with Co-ordinators	Other MDMs
Canterbury	• Bone and sarcoma • Major skin malignancies • Breast • Lymphoma	• Community • Gerontology • Older persons' health • General surgery • Eating disorders • Palliative care • Respiratory • Cyctic fibrosis • Divisional management Burwood • Sleep respiratory
Nelson Marlborough	• Nelson Wairau (faster cancer treatment co-ordinator) & Nelson back up coordinator	• Gastroenterology • Social work • General paediatrics • Physiotherapy • Audiology • Child adolescent & family mental health • Cardiology • Radiology • Respiratory • General medicine 2 (planned) • Maternity (ended) • GP (planned)
South Canterbury	None reported	• Gastroenterology • General paediatrics • Community & outpatient mental health adult • Crisis team
Southern	• Cancer • Maternity • Renal • Mental health	None reported
West Coast	None reported	• Acute mental health • Crisis team psychogeriatrics • Neonatal • Primary care general practice • Endocrinology acute mental health Hokitika whole of coast) • Community & mental health adult • Psychiatric liaison • Alcohol and other drugs • Nutrition/dietetics, gynaecology • Māori mental health (planned) • Older persons' health (planned) • General paediatrics (planned) • Laboratory, crisis team (planned) • Rheumatology/infusions (planned)

Dr Wala Saweirs, Nephrologist at Northland DHB, is an early adopter of telehealth and has used VC for his patients and with his clinical teams for several years. He offered a description of his MDMs:

> *Te Hono (from the Māori: to link or to bridge) is a one hour multidisciplinary meeting where patient cases and questions are presented by participants from primary care clinical teams to specialists present. Emphasis is on respectful, open, collegial discussion rather than didactic teaching. Everybody is invited to contribute and take part in the discussion. Although specific cases are discussed the idea is that learnings can be applied more widely, and knowledge is spread throughout the clinical teams.*
>
> *Both doctors and nurses are encouraged to attend and present cases. A range of positive outcomes were evident in our meetings last year, particularly around better management of complex cases. Learnings are not restricted to the primary care clinical teams as the specialists also found Te Hono a good vehicle for enhancing understandings as well as communication between and across clinical teams (including with other specialists!).*

Above: A telehealth consultation between Waikato Hospital and Thames Hospital.

13. Other telehealth technologies

The survey asked DHBs about the range of telehealth technologies they used in 2014 and again in 2019 including:

- Telemonitoring for remote support of patients (eg, those with chronic conditions)
- mHealth/smartphone applications for health and wellness or for remote patient support (including virtual reality and rehab games)
- Other technologies (eg, email or phone consultations).

In 2019, the survey also asked about:

- mHealth/smartphone applications or weblinks for accessing or updating clinical information
- Therapeutic technologies which deliver interventions remotely for improved outcomes
- Social media to communicate with patients/patient groups
- Chat bots or similar form of artificial intelligence (AI) to communicate with patients.

The most significant change since 2014 is in the growth of the use of email, text messaging and social media for communications with patients. There has been some growth in mobile and smartphone applications, initially for health/wellness and more recently for accessing/updating clinical information. There has also been some growth in telemonitoring/remote monitoring applications, although the uptake continues to be relatively low. Figure 38 shows DHB uses of other technologies. P/C is planning/considering.

Figure 38: Other Technologies – DHB Responses 2019

		Tele-monitoring?	mHealth for health/ wellness?	Email /phone consultations / text ?	mHealth / weblinks for clinical info?	Thera-peutic?	Social media?	Chat bots / AI?
Region	**DHB**	**2019**	**2019**	**2019**	**2019**	**2019**	**2019**	**2019**
Northern	Auckland	✓	✓	✓	✓	✓	✓	✗
	Counties Manukau	✗	P/C	✓	✗	✗	✓	✗
	Northland	✗	✓	✓	✓	✗	✓	✗
	Waitematā	✗	✓	P/C	✗	✗	✓	✓
Midland	Bay of Plenty	✓	✓	✗	✓	✗	✓	✗
	Lakes	✗	✗	✓	✗	✗	✗	✗
	Tairāwhiti	✗	✗	✗	✗	✗	✗	✗
	Taranaki	P/C	✗	✓	P/C	✓	✓	P/C
	Waikato	✗	✗	✓	✗	✗	✓	✗
Central	Capital & Coast	✗	✗	✗	✗	✗	✗	✗
	Hawke's Bay	✗	✗	✓	P/C	✗	✗	✗
	Hutt Valley	✗	✗	✗	✗	✗	✗	✗
	MidCentral	✗	✗	✓	✗	✗	✓	✗
	Wairarapa	✗	✓	✓	✓	✗	✓	✗
	Whanganui	✗	✗	✓	✗	✗	✗	✗
Southern	Canterbury	✓	✓	✓	✓	✓	✓	✓
	Nelson Marlborough	P/C	✓	✓	✓	✗	✓	✗
	South Canterbury	✗	✗	✗	✗	✗	✗	✗
	Southern	✗	✗	✓	✗	✗	✗	✗
	West Coast	✓	✓	✓	✓	✗	✓	✓
	Total Yes	**4**	**8**	**14**	**6**	**3**	**11**	**3**

▸ Email, phone, text messages

Fourteen DHBs used email, phone and text messages to communicate with patients in 2019, a very marked increase from only one DHB in 2014. Uses include correspondence, outpatient appointment reminders and consultations (not telehealth). Nelson Marlborough commented that phone reviews with patients were useful. They also find it restricting that they cannot use email for clinical discussions about patients with general practices due to privacy and security concerns.

▸ Telemonitoring

In 2014 three DHBs had implemented telemonitoring projects:

- Auckland's TeleDot remote monitoring of medication management for tuberculosis patients via video.
- Bay of Plenty's Te Whiringa Ora service using remote devices for self-management of patients with Chronic Obstructive Pulmonary Disease.
- Nelson Marlborough monitoring patients with implanted defibrillators via a third-party service.

Auckland DHB's TeleDot service continues and has won awards for its success. It appears the other 2014 initiatives are no longer active as they were not reported in 2019, nor were some services that were in planning in 2014 such a Paediatric Palliative Care initiative in Auckland.

Active and planned services were reported by 10 DHBs in 2019 as shown in the figure below.

Figure 39: Telemonitoring/Remote Monitoring – Active and Planned 2019

DHB	Telemonitoring/Remote Monitoring 2019 – Active and Planned
Auckland	**Active:** Auckland regional public health service TeleDot **Planned:** Adult & women's – vascular surgery
Canterbury	**Active:** Adult & women's – cystic fibrosis **Active:** Ambulatory & clinical – brain injury rehab, spinal, sleep respiratory (smartphone sleep health app)
Capital & Coast	**Active:** Allied health – cardiac physiology, (remote monitoring websites Carelink, Merlin, Latitude, Biotronik)
Counties Manukau	**Active:** Adult & women's – healthy together technology **Planned:** Adult & women's – community health service
Nelson Marlborough	**Active:** Adult & women's – general medicine (cardiac telemetry on the ward in Wairau / Blenheim) **Planned:** Adult & Women's – adult emergency and cardiology **Planned:** Allied health – social work **Planned:** Paediatrics (child development services) – general paediatrics
Northland	**Active:** Adult & women's – renal **Active:** Ambulatory & clinical – rheumatology, paediatric general and paediatric diabetes (download data from client CareSens meter with summary graphs prior to telehealth consult)

Continued from page 71

Taranaki	**Planned:** Allied health – nutrition/dietetics **Planned:** starting to consider others based on priorities
Waikato	**Active:** Ambulatory & clinical – dermatology, haematology, respiratory
Waitematā	**Pilot:** : Allied health – physiotherapy
West Coast	**Active:** Ambulatory & clinical – endocrinology **Planned:** for Greymouth and Westland: Adult emergency (VC and St John Clinical Guideline App), Cardiology (VC and Pacemaker App), general medicine, allied health / dietician, and paediatrics **Planned:** Mental health – acute mental health inpatients, community & outpatient mental health adult, crisis team, Māori mental health, psychiatric liaison, psychogeriatrics

▸ mHealth apps for health/wellness

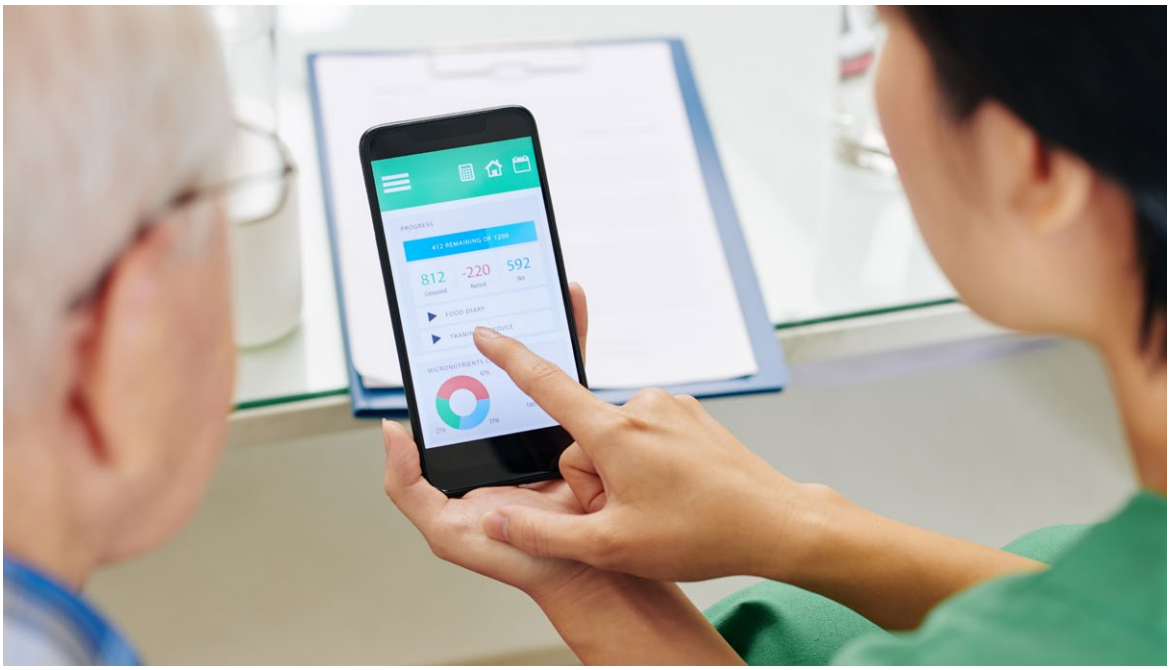
The number of DHBs using mHealth apps for health/wellness or remote patient support has increased from five in 2014 to eight in 2019.

Canterbury is using virtual reality to:

- Help manage anxiety of patients associated with MRI scanning
- Help with wheelchair rehabilitation after a stroke.

Northland's applications include:

- An initiative that will allow patients to self-report to a chemotherapy clinic. This has the potential for application for patients with long term conditions
- iPad games for distraction therapy by Public Health Nurses in the community.



▸ mHealth/weblinks for clinical information

Six DHBs reported using mHealth/weblinks for accessing clinical information and two DHBs (Hawke's Bay and Taranaki) plan to use them.

- A small number of Auckland DHB staff can access their patient results
- Northland has business cases in progress for MedChart, eVitals, JADE (community PAS), replacement that all have a high reliance on the adoption of mobile technology. Most future core hospital IT projects are expected to have a mobility component.
- Canterbury patients may send their medical device related data to the Cloud, using HIPAA compliant processes facilitated by the vendors of medical devices (diabetes, sleep related devices). The DHB is also using mobile apps for clinical care (eg, cortex).
- Nelson Marlborough use HealthOne for patient weights and prescription information.

▸ Therapeutic technologies

Two DHBs reported the use of therapeutic technologies.

- Auckland is in the early stages of a rehabilitation application for the Auckland Regional Pain Service (TARPS).
- Canterbury reported using these technologies in the clinic trials / research space but was not aware of any applications in mainstream use.

▸ Social media

Eleven DHBs reported using social media for patient/patient group communications. Most cited the use of Facebook in general.

- Canterbury makes use of third-party applications to recruit DHB-hosted clinical trials.
- Nelson Marlborough DHB runs a Facebook group for patients with implantable cardioverter-defibrillators (ICDs).

▸ Chatbots

Three DHBs reported the use of chatbots, but only for internal use (West Coast for HR) or research (Waitematā) and trial purposes. Canterbury is trialling their use in Burwood in relation to prioritisation of nursing and nurse aide tasks. Other DHBs have shown interest. Taranaki is considering it in relation to clinical priorities.

Appendix 1: Clinical services benefits matrix

Comments by Clinical Services on value in telehealth	Travel reduced pt & clinician	Pt access/ equity	Quality of treatment	Seen faster/ reduce wait lists	Avoid admissions/ reduce DNA	Clnician collabor-ation	Efficiency	Staff safety	General/Other
Less time commitment.							⊗		
Contact with patients and health practitioners out of area.		⊗				⊗			
Opportunities to learn from others outside of your immediate circle.						⊗			
It is advantageous, convenient, care delivered closer to home for patients and for the organisations allows more new and complex patients to be seen. Decreases waiting lists.		⊗		⊗					
Avoids travel, facilitates patient centred engagement.	⊗	⊗							
Enabling follow-up and sometimes acute assessment in rural locations.		⊗							
Saves driving and parking on different sites to attend meetings.	⊗								
Convenience for patients, reduced travel time for clinic staff.	⊗	⊗							
Access to quicker response times Access to other health professionals		⊗				⊗			
Convenience for patient and clinician, reduce wait times, equity for rural patients, better support general practice teams.		⊗				⊗			
Lots of potential particularly in servicing remote areas. Good for small group meetings and where a clinician in the community needs an urgent opinion from a colleague. I'd like to think we could eventually have virtual MDT meetings with primary care.		⊗				⊗			
Great for multi-site meetings, prevents patients having to travel to attend a clinic appointment.	⊗					⊗			
Benefit for the patient not having to travel distances.	⊗								
Spinal services geographical area makes sense to use tele health.	⊗								
Safety of staff when seeing patients in prisons and more efficient health delivery to stretch limited resources further.							⊗	⊗	
Allows attendance at clinics or meetings that would otherwise be logistically difficult.						⊗			
Access to outreach clinics when unable to physically attend these clinics due to time and resource constraints.						⊗			
Overcomes geographic separation.		⊗							

Comments by Clinical Services on value in telehealth	Travel reduced pt & clinician	Pt access/ equity	Quality of treatment	Seen faster/ reduce wait lists	Avoid admissions/ reduce DNA	Clnician collabor-ation	Efficiency	Staff safety	General/Other
Improving access to patient care - we have service with people living throughout the South Island, some remotely.		⊗							
Enhance clinical practice and workflows for service delivery, time efficiencies if used well, connectivity for workforce with colleagues regionally, nationally and for teams who are spread out geographically.						⊗			
Being able to work regionally without requiring the patient to travel. Able to share knowledge with regional colleagues. Patients are able to gain expertise in their own region.	⊗	⊗				⊗			
Ability to interact with remote centres and cut down travel	⊗					⊗			
I conduct genetic counselling appointments by Zoom videoconferencing in private practice. It works really well. Being able to see the patient helps build rapport. I can explain concepts using diagrams and respond quickly to questions by bringing up information.			⊗						
Allows face to face YouTube viewing over large geographical distances.		⊗							
Reduce inequity of access; secondary benefit for clinician locally not having to drive into hospital in the night. Also initially we trialled this with Scotland where the 12 hour time difference meant clinicians were always working during day light hours which has obvious advantages. Another advantage for us here has been economy of scale i.e. more value for money, and better patient care as telestroke docs do now very high volumes of cases so are better at it.	⊗	⊗	⊗						
Reduced travel time and waiting time for follow-up appointments for adult clients.	⊗			⊗					
More efficient, can reach more people and enables better likelihood of fruitful discussion.			⊗			⊗			
Cost saving, greater availability of expertise to peripheral areas.	⊗					⊗			
Reduced travel time for patient +/- clinician, more convenient for patient (less time of work to attend appointment during business hours), ability to 'see' patients who live remotely (rather than just phone conversations).	⊗		⊗	⊗					
Time saving.				⊗					
Patients don't need to come to the hospital as often.				⊗		⊗			
We can pick up on issues with patient devices very quickly.			⊗						
We can liaise with colleagues at other DHBs.		⊗							

Comments by Clinical Services on value in telehealth	Travel reduced pt & clinician	Pt access/ equity	Quality of treatment	Seen faster/ reduce wait lists	Avoid admissions/ reduce DNA	Clnician collabor-ation	Efficiency	Staff safety	General/Other
Quick access to medical support - especially when our existing consultant was on leave. To access a different speciality set e.g. neurology vs rehab physician.						⊗			
Huge value - being able to see patients at their venue of choice and reduce travelling time for clinician.	⊗			⊗					
Save time, more convenient, flexibility.	⊗	⊗					⊗		
Huge value for efficiency after initial relationship made.							⊗		
Efficiencies in patient care but remote viewing for information; video conferencing for patient to clinician / clinician-to-clinician and even MDT meetings.		⊗					⊗		
Brings the information to the patient, provides choice.		⊗	⊗						
This has proved to beneficial in seeing patients in their agreed time frame for FU appts.				⊗					
Excellent - saves our doctors a lot of driving - 2 hours each way.	⊗								
There is a pool of patients that do not need clinical assessment and a conversation is enough for provision of care. It is quick and convenient and saves the Consultant having to travel.	⊗								
Ability to provide specialist services to clients in wide locality and to provide cost effective service in reducing transport time.	⊗	⊗					⊗		
Can save patient travel and clinician time.	⊗								
Improve efficiencies in delivery of care but still provide patients with the expertise they require for the management of their cancer.			⊗				⊗		
Patients at the centre of care where they want care delivered.		⊗	⊗						
Services closer to home.		⊗							
Patient convenience, less travel.	⊗								
Definitely valuable, time saving, money saving, responding quicker to patients.	⊗			⊗			⊗		
Time efficient, save in travel time and costs. Benefits the family not having to travel and be comfortable at home.	⊗								
Fast access to imaging, increased access to education and MDT district wide and nationally.						⊗	⊗		
Manage speciality areas over challenging geography when resource issues.	⊗						⊗		
Increased support for clinicians working in isolation. Mentoring opportunities.						⊗			
Interviews education and meetings OK.						⊗			

Comments by Clinical Services on value in telehealth	Travel reduced pt & clinician	Pt access/ equity	Quality of treatment	Seen faster/ reduce wait lists	Avoid admissions/ reduce DNA	Clnician collabor-ation	Efficiency	Staff safety	General/Other
Able to access more remote clients, save on travel for clients and staff.	✕	✕							
Less travel for patient or clinician, reduced cost, able to carry out more frequent sessions, able to access specialist services more easily.	✕			✕			✕		
Reduces need to travel for patient and Doctor.	✕								
Improved care with telestroke.			✕						
Very powerful for radiology. Teleradiology allows off site reporting for efficiency, productivity and after-hours cover.			✕				✕		
Ability to service remote populations and or share consultants over a wider area						✕	✕		
Reduced stress and trauma for the client. More efficient use of time for clinicians which can be invested in patient care. Considerable reduction in travel costs.	✕	✕					✕		
In the Far North of NZ it has huge benefits to the patients. A well planned and run telehealth clinic can save lengthy travel to base hospital services whilst still attending to their health care needs. In an area of geographic isolation and economic deprivation this is a valuable way to access secondary services.	✕	✕							
I see great value in using telehealth to establish improved accessibility to health for patients.		✕							
Due to our location we rely daily on using VC for clinical handover. Meetings to connect with clinicians or management meetings within the region.						✕			
Extremely valuable. The work to support chronic and complex patients, particularly in more rural and remote mid and far north areas, to remain at home, to prevent ED admissions and support general practice to lead community-based care coordination through MDT Meetings would not be possible in Northland without the flexibility of telehealth options.			✕		✕	✕			
Our ICU provides the Helicopter transfers for NDHB patients from our rural Hospitals (Kaitaia/Dargaville/Bay of Islands and Rawene). Patients need to be assessed for all eligibility and suitability prior to transfer. Via Telephone this is often very difficult and is prone for misinterpretation Telehealth provides clear benefits and improves safety for the patients and also gives us the ability to supervise and assist our flight team (often registrars and flight nurse) on site.			✕			✕			
Saving travel time, cost and more efficient use of resources. Our Dentists are happy that they may not need to do so much travel.	✕						✕		
Addressing equity issues, less cancelled clinics.		✕					✕		
Very useful for remote areas.		✕							

Comments by Clinical Services on value in telehealth	Travel reduced pt & clinician	Pt access/ equity	Quality of treatment	Seen faster/ reduce wait lists	Avoid admissions/ reduce DNA	Clnician collabor-ation	Efficiency	Staff safety	General/Other
Allegedly it is cost saving.							✕		
Patients not having to travel long distances to clinics.	✕								
Huge value in time saving and adding value to the cost of highly paid clinicians. Additional benefits are to earlier responses to patients and reducing waiting times. Also reducing the risks associated with clinicians travelling.	✕			✕				✕	✕
Excellent for patients and avoids unnecessary travel for a 3 min appointment.	✕								
Care to closer to home, preventing patients from travelling to tertiary centre for multiple appts.	✕	✕							
Ability to get easy, quick advice by experts.			✕	✕					
Building of relationships between secondary and tertiary.						✕			
Support for our rural hospital to access advice.						✕			
I see great value in telehealth for 1. improving clinically effective care by in-reaching with specialist advise, 2. education and support to professionals and patients, 3. improving access to health care advice and follow-up for patients in remote areas, 4. improving communication.		✕	✕			✕			
It saves time and resources.							✕		
Saves time and cost of travelling to rural places.	✕								
Excellent outcomes for patients in the acute setting to have quick access to intervention for our stroke patients. Telehealth enables this to occur more interactively than a telephone conversation.			✕	✕					
Quick and effective encounters; reduced need of travel; ability to reach remote community with major ease.	✕	✕							
Reduce costs. Offer more efficient service.							✕		
Ability for patients to receive the care and treatment that they need without having to travel. Better, more efficient use of resources.	✕		✕				✕		
Significant in managing demand, reducing DNA and more patient focused.					✕				
Easier access for patients to access secondary services in remote rural locations.		✕							
The urology service at Wairarapa DHB does not have any resident urologists. Therefore, Telehealth allows us to have extra "non contact" clinics without the need for a urologist to be physically present.			✕	✕			✕		
Very valuable. It enables a room full of experts to work together to put best treatment plan in place for individuals which reduces appts and speeds up treatment.						✕			
This is a great way for a patient to be reviewed and procedures to be explained by other teams that they may be going to be under, saving a trip to this hospital.	✕		✕						

Comments by Clinical Services on value in telehealth	Travel reduced pt & clinician	Pt access/ equity	Quality of treatment	Seen faster/ reduce wait lists	Avoid admissions/ reduce DNA	Clnician collabor-ation	Efficiency	Staff safety	General/Other
Allows expert input into clinical decision making						⊗			
A lot of value for services such as ours as cover 3 DHBs as part of Auckland regional service.									
Saves patient time and cost of travelling to hospital.	⊗								
Allows us to not always have to be present in person and can direct our patients to evidence based informative videos online.	⊗		⊗						
Reduce DNA rates due to time commitment, travel commitment, parking costs.					⊗				
Huge value particularly as I travel long distances to see clients. It would also be great if we had secure connections with clients using Zoom in our service so we could provide service to remote clients.	⊗								
It was great as I was able to answer questions as they come up and provide more frequent support. Symptoms were tracked and parents could also take photos and it was all linked to their electronic medical record on the system. It also meant parents didn't have to travel to appointments and could communicate at a time that was convenient for them. It reduced the cost for clinicians as well as reduced travel time between GPs and cost of clinic rooms. It also improved patient outcomes.	⊗		⊗	⊗					
Increased efficiency and sustainability. Potential for use in private hospitals with resident nurses would engage the staff nurses more and hopefully improve their understanding of communication and swallowing problems, thus reducing. inappropriate referrals. Increasing intensity of intervention improving patient outcomes.		⊗			⊗	⊗	⊗		
More convenient for the patients is the main value.	⊗	⊗							
More convenient for patients, might be able to see more patients this way.	⊗						⊗		
Massive value for patients to save travel and when it is rolled out on our computers in clinic it will greatly improve usage.	⊗								
It respects the patient's efforts. It saves them time and energy and loss of earnings.	⊗								
Massive value for patients to save travel and when it is rolled out on our computers in clinic it will greatly improve usag.	⊗								
Help with emergencies or when we cannot transfer the patient.					⊗				
Yes. It reduces travel time for meetings and frees up more clinical availability for local clients.	⊗						⊗		
Assists in rural and geographically separated communities.		⊗							
Removes travel time and enable participation in education opportunities that would not generally be viable for all team members to attend.	⊗					⊗			

Comments by Clinical Services on value in telehealth	Travel reduced pt & clinician	Pt access/ equity	Quality of treatment	Seen faster/ reduce wait lists	Avoid admissions/ reduce DNA	Clnician collabor-ation	Efficiency	Staff safety	General/Other
Allowed IDT teams to communicate regularly in a rural area, to provide clarity of vision and quality outcomes of care for people, provide appropriate resources, ensure appropriate skill mix and provide a supportive team environment.						⊗			
Increased participation with patients and with specialists from other areas as a lot of our clinics are done with visiting specialists.						⊗			
Avoiding long trips to tertiary facilities for unwell patients.	⊗								
Ease of connection with remote colleagues, peers and management. Financially viable method of accessing education and staff for filling CPD requirements.						⊗	⊗		
Great in terms of cutting out the need for travel when in a rural community	⊗								
Saves patients many hours and miles travelling to hospital OP clinic.	⊗								
Telehealth is essential to the delivery of rural health care.		⊗							
Huge value for remote / rural patients.		⊗							
The ability to reduce to costs incurred by patients for them to be seen.	⊗						⊗		
Massive - while we don't always access the available sessions each week - we do have access to these sessions time and patient load permitting.						⊗			
Useful in a rural DHB to reduce the amount of travel time for clinicians & patients.	⊗								
Very valuable improves access to cardiologist.		⊗							
Less travel for patients, particularly elderly, frail patients.	⊗								
Handy if the doctor can't come to the hospital. Pts still get seen and care is still provided. Pts like to see the doctor. It works well.		⊗	⊗						
Excellent value. Has enabled clinicians and clients to engage with meetings, follow-ups, education sessions that would otherwise involve a lot of expense, travel and wasted time. Particularly beneficial in remote areas as there is no public health system on the Coast.	⊗	⊗				⊗			
Save travel time, less threatening sometimes than face to face.	⊗		⊗						
Saves patients time.	⊗								
Less travel time for patients in remote locations, multisite communication, ease of access for clinicians in remote sites, possibility for service by another means when weather precludes physical presence.	⊗					⊗	⊗		
Helps to connect you to your patients' who are more rural and still provides face to face benefits.		⊗							
Saves everyone time and stress of travel.	⊗								

Comments by Clinical Services on value in telehealth	Travel reduced pt & clinician	Pt access/ equity	Quality of treatment	Seen faster/ reduce wait lists	Avoid admissions/ reduce DNA	Clnician collabor-ation	Efficiency	Staff safety	General/Other
Provides reliable service as not weather dependent.			⊗				⊗		
Large potential to reduce need for hospital attendance and bring expertise to remote areas.		⊗			⊗				
Has potential to maximize effective use of time for clinicians and service users by reducing travelling - could also empower and enable access for remote service users and whānau. Major advantages in assisting with equity.	⊗	⊗					⊗		
Very valuable for our teams in the Rural areas.									⊗
GREAT value, if used correctly.									⊗
We still have a long way to go to optimise.									⊗
Huge potential.									⊗
There is currently huge untapped potential around telehealth within our organisation and particularly within the Community Health Service.									⊗
Very useful.									⊗
A poor replacement for face to face but occasionally invaluable.									⊗
It's another tool. It can be helpful. It can also be dangerous.									⊗
Yes but I think first assessments need to be in person.									⊗
I use email a substantial amount of the time for making appointments, gaining consent for trialling equipment or for students to visit, discussing strategies.									⊗
There is currently huge untapped potential around telehealth within our organisation and particularly within the Community Health Service.									⊗
Over sold. Cannot beat one on one patient interaction. Good if no alternative.									⊗
Limited though I use the telephone to patients a lot and this seems excluded from survey?									⊗
Untapped at present.									⊗
Variable. Plus and minus.									⊗
Hugely valuable.									⊗
I think it has some potential.									⊗
Positive value.									⊗

Total unique comments	**59**	**41**	**23**	**14**	**6**	**35**	**29**	**2**	**20**
Percent of total 149 comments	**40%**	**28%**	**15%**	**9%**	**4%**	**23%**	**19%**	**1%**	**13%**

Note: Percentages don't total 100 percent since some comments were applicable to more than one category of value.

Appendix 2: Clinical services comments on barriers

	Barrier Category				
Comments from services on barriers and how to overcome	**Technical/ Equipment**	**Clinical/ Staffing**	**Governance**	**Patient**	**Other**
The technology breaks down occasionally. Unable to make connections or more recently no sound. We have sometimes had to talk to each other by speaker phone to enable a meeting.	⊗				
Our DHB have chosen Zoom as a platform which requires duplicate scheduling - once in our patient admin system and once in Zoom. There has been resistance from schedulers to take on this extra work.	⊗				
New service. We need to get used to it and make it commonplace. It is not this yet.		⊗			
Accessibility - have been asked to move several times, have other centres that can't find a machine to log into at the right time to attend our meetings.	⊗				
Limiting budgets is a barrier to increase telehealth service.			⊗		
Access the correct supports in the community for the client to be supported before, during and after the appointment.		⊗		⊗	
Need keen and resourced gerontology nurses to develop processes at West Coast end, esp Greymouth/Hokitika. Wound care telehealth not yet started.		⊗			
Still waiting to relocate a significant number of staff to a new hub so not going to invest in some things while at our current environment.		⊗			
Time to establish processes and protocols and change the culture.		⊗			
Inaccurate information from Corrections, Justice and DHB on telehealth configuration and access for their respective system. Difficulty to obtain financial support from DHB to roll out system.					
Lack of national information or support to roll out new initiatives resulting in senior clinicians attempting to find information outside their usual sphere of expertise and likely repetition across the country with resultant waste and variance in systems.	⊗	⊗	⊗		
Admin infrastructure in terms of coding and capturing appointments.			⊗		
Access to equipment. Find zoom an excellent platform.	⊗				
What is needed: Road map for telehealth as part of the DHB strategy, device management as part of the system wide roll out, upgrading to sophisticated mobile devices - e.g. smart phones with high spec operating systems and more memory, staff training and coordinated approach for ongoing development with technologies.	⊗	⊗	⊗		
Improved access on laptops to enable access to patients in times that they are available. Currently it is a mission to find a suitable log-in and available "room" to book. Currently, access is limited by licence availability. Maybe advertising the improved access to service may help others to explore possibilities in their own areas or to at least consider the improved access for regional patients.	⊗				
Lack of support e.g .nurses to assist patients who have the right technical knowledge. Limited resource of units meaning rooms need to be booked and cannot be used on ad hoc basis.		⊗			

	Barrier Category				
Comments from services on barriers and how to overcome	**Technical/ Equipment**	**Clinical/ Staffing**	**Governance**	**Patient**	**Other**
No structure to support telehealth clinics - who would support patients to attend appointment? Where and how who would they access equipment?	✕	✕	✕		
Adequate video conferencing facilities in all clinical locations	✕				
Initially clinician buy-in was the biggest hurdle - anything new is often scary. There were some issues with funding, but that was relatively easily sorted. Some occasional IT issues especially around wi-fi in EDs, but it seems to all run pretty smoothly now. PACS image transfer still too slow. The neuro exam issue is much less of a problem than we all thought. In general, no major issues at all really.					
Limitations set by network administrators in the firewall which prevent implementation of such technologies.	✕				
Judges are reluctant to use it for mental health court, and also it can be difficult getting them to agree for young people to attend via AVL for criminal court. This means that some kids may miss out because they're too risky to leave the building but should still be afforded due process in my view.					✕
No facilities in our most remote office (Gisborne)	✕		✕		
Ensuring appropriate access to technology - for clinicians and clients.					
Clinical governance frameworks.	✕				
Clients having technology within their home.	✕				
It is very time consuming contacting all of the patients whose monitors aren't working. Would be useful to have an admin person who could help us with this.	✕				
Having compatible IT services in each DHB. Some issues with linking in with Hawke's Bay DHB, particularly around secure networks.	✕				
ICT set up, security/consent.	✕				
Cost, ease of access, equipment provision.	✕				
Speed of viewing charts i.e. logging on to a computer (easier and quicker to view a paper chart).		✕			
Clinicians time to work on the project. Everyone is so stretched.		✕			
Elderly patients can find it difficult - a nurse has to be present.		✕		✕	
Better connectivity and software that does not need updating quite so frequently or that the staff on the floor can do themselves without having to contact an administrator.	✕				
Funding for work completed as telehealth, easy access to video conferencing, formal programme to roll out further and review outcomes.			✕		
Time, money and resources.		✕	✕		
Some patients are not suitable for telehealth appointments as they need physical assessments a nurse may not be able to provide. We would need to engage with medical team at home DHB to determine if they would be willing to be involved in clinics so they could examine on our behalf; also as telehealth becoming more popular the use of our dedicated VC equipment for these clinics is getting more booked up - will need to invest in using alternative such as zoom via laptop with camera etc if to expand service.		✕		✕	
Access to mobility devices and training on use of. Plus all the consent and security requirements have not been fully considered.	✕				

	Barrier Category				
Comments from services on barriers and how to overcome	**Technical/ Equipment**	**Clinical/ Staffing**	**Governance**	**Patient**	**Other**
High quality video and audio connections. Remote sites for rural locations like Golden Bay and Murchison.	⊗				
Hardware, software, (Lack of) interest.	⊗				
Devices for video conferencing for staff and to loan to the patient/family.	⊗				
Internet access.	⊗				
Mobile phones with VC capability would be great. Better funding and follow-though for requests such as when a mobile phone is needed. I have a staff member who has been waiting near 6 months to get one.	⊗		⊗		
Using technology that is compatible across sites and familiar/accessible to patients.	⊗				
Poor equipment and sound quality affects patient experience.	⊗				
Physical environments, level of availability and or sharing. Organisational strategy lacking. Biggest challenge to full use of electronic transmission is alignment with privacy code - sharing patient information electronically.	⊗	⊗	⊗		
Patchy connections in Northland. Perceptions of the client [potential for paranoia] Absence of suitable hardware for community staff. Staff training needs to be formalised.	⊗	⊗		⊗	
In terms of Telehealth and Mental Health Act Family Court hearings....it is hugely important that we have reliable interface from the in patient unit.	⊗	⊗		⊗	
Resource - time & hardware as well as telephone/3G coverage.	⊗		⊗		
Availability of specialists for clinics, local facilities to have dedicated room available.	⊗	⊗			
You must have excellent equipment. Sounds and sight needs to be perfect for the maximum patient benefit.	⊗				
Electronic equipment installation and cost of this to the organisation is not always easy to achieve.	⊗		⊗		
Predominantly IT systems and funding for appropriate devices/resources are still to be fully explored for Allied Health here.	⊗		⊗		
Environmental issues fitting in new equipment/technology in an old, not fit for purpose ED. Financial/IT implications for new equipment can also be challenging.	⊗		⊗		
Management is not seeing the full benefit of it, I am afraid. Plus - psychotherapist are not willing to give a try.		⊗	⊗		
Education, ease of booking, awareness of potential benefits for staff and patients.	⊗	⊗	⊗		
Availability of technology in rural hospitals. Privacy restrictions and health professional log ins.	⊗				
IT support, available rooms to conduct clinics.	⊗				
Sometimes hard to hear with typists being close to the volume at other end however we get around this and have it typed up to go over afterwards.	⊗				
IT teething problems needing to work through. As not part of pilot the initial relationships with the providers were not established.	⊗				
Training.	⊗	⊗			
Device accessibility. Wi-Fi/ device access for clients - options currently being explored to overcome this (i.e. - supply a device to an NGO health service in rural area for client use and NGO supply data access as one option).	⊗				

	Barrier Category				
Comments from services on barriers and how to overcome	**Technical/ Equipment**	**Clinical/ Staffing**	**Governance**	**Patient**	**Other**
Limited computers with Zoom. Expensive due to needing two / dual screens and screens with cameras.	⊗				
Access to video contact with families through Zoom, difficulty with some staff accepting telehealth as a method of service delivery. At this stage low level of interest among AH colleagues in increasing use of telehealth and understanding telehealth.	⊗	⊗			
Recording of telehealth appointments in our patient administration system was initially difficult. Cost of licenses. Scheduling on behalf of clinicians is hard. Patients who would rather see a person (biggest reason for turning it down).	⊗	⊗			
Availability of units in tertiary DHB. Technophobes.	⊗	⊗			
The availability and accessibility to units in CDHB for clinicians. Having to travel out of there departments or clinical areas to source a unit is a big barrier.	⊗	⊗			
It would be great to have a better room for telehealth. it would be really good to have a VC that can catch the details in a better way. It is really frustrating when in a true emergency we have issues with telehealth and the other side cannot hear or see properly.	⊗				
Establishing connections can be difficult. Communication in a multi-user situation can be difficult for those that are not the primary host.	⊗				
Other services in the tertiary facilities are unsure how to use it and perhaps there are barriers as to why they don't want to.		⊗			
Lack of a co-ordinated cost effective well supported (by ISG and general user support) telehealth solution across the South Island.	⊗		⊗		
Seamless linking between platforms. Easy understanding of the new computer-based options e.g. Zoom, Real Presence. Consistency about options, i.e. there is such a broad range ... e.g. can you Zoom, can you Skype, can you video chat on your phone - too many options are paralyzing especially when they don't link well!	⊗				
Can sometimes be quite difficult to get a telehealth room as they're are already booked.	⊗				
Time. It takes time to organise these telehealth meetings and also having the appropriate pt available.	⊗	⊗		⊗	
The availability of the units and clinic assistants to record outcomes.	⊗	⊗			
Sometimes when turned on and it does not work then time delays for care to be given.	⊗				
More access to telehealth monitors.	⊗				
At times there are issues of access with malfunctioning equipment and connections. Mostly good though and IT services a great help. It is also very expensive to invest in or replace.	⊗		⊗		
Need desktop equipment to provide patient service so that the follow up just becomes part of normal practice rather than having to go to another location and have a separately arranged clinic. It's coming I think.	⊗				
Access to adequate internet in hospital and in peripheral centres. Restrictive policies on use of devices and software. Excessive fear regarding confidentiality.	⊗	⊗			
Issues with shared offices and sometimes having equipment moved. Hopefully we are overcoming that.	⊗				

Total unique comments	59	26	18	5	1
	77%	36%	23%	6%	1%

Note: Percentages don't total 100 percent since some comments were applicable to more than one category of barrier.

NZ TELEHEALTH
FORUM & RESOURCE CENTRE

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C/- Mobile Health

Suite 4, 6h Sir William Pickering Drive, PO Box 39188, Christchurch

telehealth.org.nz