ASMS RESEARCH BRIEF

Telehealth

The adoption of telehealth in New Zealand has been on the rise in recent years. Most recently, the Covid-19 pandemic necessitated a significant shift in the provision of health care services with telehealth services a key tool in preventing the spread of the virus and protecting healthcare workers from the illness.

This paper discusses the development of telehealth and issues related to its uptake. It follows ASMS' previous reporting on telemedicine (ASMS 2018).

This Research Brief begins by defining telehealth and considering the reasons why it has developed. It then goes on to discuss the various benefits of telehealth particularly in the New Zealand context before attending to some of the challenges associated and various barriers to its uptake. Finally, the Research Brief looks at how Covid-19 has changed the landscape of telehealth in New Zealand and concludes by considering future directions.

What is telehealth?

There is no universal definition of telehealth. The New Zealand Telehealth Leadership Group (NZTLG, previously Telehealth Forum) uses the following description:

> *Telehealth is the use of information and communication technologies to deliver health care services when patients and care providers are not in the same physical location*

The NZTLG acknowledges that there is an ongoing debate on terminology with the recent evolution of the term 'virtual healthcare', and some DHBs refer to remote methods of healthcare delivery as virtual health. There is a view that telehealth is a broader term than virtual health and that it encompasses the entirety of remote and/or technology driven healthcare (Care Innovations.com n.d.). Telemedicine, telemonitoring and mHealth are the key types of telehealth used in New Zealand and are defined as follows (Adapted from Health Navigator 2020):

The word '**telemedicine**' literally translates to 'healing at a distance' and refers to the use of information and communication technologies (ICT) such as email, video conferencing, phone, remote wireless monitoring and internet to provide remote health care. The most common tools used are video conferencing and store and forward (for example, teleradiology).

Telemonitoring is the remote collection and transmission of patient data so that it can be interpreted and then contribute to the patient's ongoing management. Collecting and sending the data in real time (synchronous) is referred to as telemetry.

Mobile Health (**mHealth**) is the use of mobile communication devices to deliver health services and information using devices such as smart phones and wearable monitors.

Drivers and benefits of telehealth

The drivers for telehealth are both technological and non-technological (Norris, 2002 cited in Lucas, Day et al. 2016 p6). The capabilities afforded by ICT, network and telecommunications infrastructure have enabled telemedicine video consultations with patients and remote monitoring of patients' conditions. Secure video consultations can be used by specialists in urban hospitals to assess critically ill patients presenting to rural hospitals. Telehealth technology can be used by patients at home to take their own vital sign measurements (blood pressure, heart rate, and blood sugars) enabling the patient's medical team to assess the data remotely and monitor changes.

Non-technological drivers include the lack of access to healthcare and specialist services due to geographical isolation, potential cost-savings, and to improve the range and quality of available health services. Challenges facing healthcare systems such as ageing and rising populations, increased life expectancy and an increase in chronic disease have contributed to an investment in telehealth as a means of increasing patient access and improving care (Field and Butler 2018).

The Medical Council asserts that telehealth enables patients in isolated locations to receive necessary care, provides patients with more convenient access to care, allows for more comprehensive delivery of services after-hours, and allows for more efficient use of precious health resources (MCNZ 2020). There are differing views regarding the cost effectiveness of telehealth that are discussed later in this paper.

The Ministry of Health's digital health framework guides the use of digital technologies and data "to support a strong and equitable public health and disability system" (MoH 2020). The framework does not take a directive approach to implementing digital health services. Instead, it allows agencies to make "good decisions that move the sector in the right direction at the right pace", and emphasises that agencies are responsible for planning and implementing specific digital health services (including telehealth) as part of their own strategic and operational plans.

The uptake of telehealth is occurring through various efforts at local and regional levels rather than being centrally led. However, the recent review of the New Zealand health and disability system may potentially lead to more central involvement in the development of telehealth tools and services in the future. The review proposes that a new crown entity, provisionally called Health NZ, would be responsible for leading health and disability services delivery in New Zealand.

At present, NZTLG (formed in 2011) is the key promoter of telehealth as an enabler of change in healthcare delivery. It was funded by the then National Health IT Board (NHITB) and its establishment was timed to maximise the benefits of the Government's broadband programme. The NZTLG is now funded by the Ministry of Health and is led by a leadership group that includes clinicians, consumers, policymakers, planning and funding managers, ICT experts and industry representatives (Telehealth 2020a). In May 2020, the NZTLG published the results of its second survey of telehealth activity in New Zealand's 20 district health boards (DHBs). The survey was carried out between October 2018 and March 2019.

The results of the survey suggest that telehealth is gradually becoming an integral part of medicine. In the South Island, a regional telehealth strategy was created in 2019 with the aim of implementing telehealth in a more coordinated and equitable way (Todd 2019). Similar regional arrangements are in place in the midland region DHBs (Waikato, Bay of Plenty, Lakes, Taranaki, and Tairāwhiti) and the four northern region DHBs (Northland, Waitematā, Auckland, and Counties Manukau). These developments, along with initiatives in the central region, are contributing to growth in uptake of telehealth.

According to Capital and Coast DHB, telehealth can improve access to health services for people who struggle to attend appointments, for example, people who lack transport, have work or childcare commitments (CCDHB 2020). Many patients cite the convenience of a telehealth consultation as a positive change (Bohot and Dixon 2019). The main reasons patients chose a telehealth outpatient appointment in a Waitematā DHB trial using Zoom were "to reduce travel, save time, save money and a shorter wait" (*Ibid* p9)[1]. During the trial, patients saved an estimated $9,500 in travel costs in total in addition to loss of earnings savings of $5,200 and saved approximately 324,000g carbon by not travelling. The DHB estimated it saved $151 on average per telehealth appointment by not needing to use a clinic room, receptionist, or nurse (*Ibid*). Dr Ruth Large, Chair of the NZTLG has noted that telehealth offers a potential bonus for Māori who have a higher number of outpatient appointments per annum compared to non-Māori in many health districts with associated travel costs (Large 2020).

Improving the timeliness of outpatient care is recognised as a priority internationally as health systems face increasing demand for specialist services. There is some evidence to show that electronic consultations (asynchronous, text-based store-and-forward consultations between a referring clinician and a specialist) and image-based triage of referrals can be effective in reducing waiting lists and waiting times for specialist outpatient services by avoiding in-person appointments (Caffery, Farjian et al. 2016). The researchers note, however, that most services report that less than 10 percent of referrals are suitable for electronic consultations *(Ibid)*.

A major study in a NHS acute trust found that when clinical, technical and practical preconditions are met virtual consultations appear to be safe, effective and convenient for patients who are preselected by their clinicians as 'suitable' even though such patients represent a small fraction of clinic workloads (Shaw, Wherton et al. 2018). Findings from the study also suggest that video consultations work better when the clinician and patient already know and trust each other *(Ibid)*.

The case for telehealth consultations seems logical and compelling, however, it is not always acceptable or accessible for patients. For example, just over half of the patients who were offered a telehealth appointment in the Waitemata DHB trial declined in favour of an in-person appointment[2] (Bohot and Dixon 2019). Patients cited lack of confidence with computers, not having internet access or a space suitable to take the call (*Ibid*), highlighting that a shift to telehealth may exacerbate inequities.

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[1] The trial covered four clinical areas: Otolaryngology, Diabetes, Physiotherapy (Lymphedema) and Altered High Youth Service (CADS).
[2] The accept / decline outcome was not recorded for CADS.

Thus, despite the positives, there are some issues with telehealth which deserve consideration. The next section of this research brief attends to further barriers and challenges.

Barriers and challenges

The study referred to above on the use of telehealth in a NHS acute trust found pressure on human and financial resources was the most significant barrier to implementing virtual consultation health services (Shaw, Wherton et al. 2018). The study found key posts were not filled; clinics were heavily booked; and the IT department was reluctant to support a major new technology initiative, because of severe staffing pressures. Some clinicians were unwilling to try the new technology because they were too busy. The authors note virtual consultations involve numerous and complex changes, for example, to routines for booking appointments, documenting consultations, and for arranging follow-ups. Data from the study starkly illustrated that high workloads and lack of organisational 'slack' (time, space, people, expertise) severely limited front-line teams' capacity to initiate and successfully maintain the embedding of virtual consultations in their clinical work. The authors conclude that, while the technology 'works', adoption of telemedicine tends to be circumscribed due to these pressures.

Another key finding from this study is the importance of allowing clinicians and administrative staff the time and space to learn new technological developments. Further, it is imperative that they have the time to consider how best to link it with clinical care, to be confident in its use and feel able to decide whether or not to adopt and embed the technology within clinic routines. The researchers found that strong clinical leadership and 'champions' of the new technology and mode of service delivery appear to be key to overcoming the multiple and intersecting barriers (Shaw, Wherton et al. 2018).

As noted above, a shift to telehealth services may amplify inequities. The Ministry of Health acknowledges that to be effective, telehealth requires fast broadband internet services. As a consequence, it has committed to actively addressing disparities in use of digital health services due to location, cost, digital literacy or other factors (MoH 2020). However, despite the increased availability of fast broadband services there are still many in New Zealand without internet access; the 2018 census showed 211,000 households (13%) do not have internet access at home, which is likely to be an underestimation given the flaws with the 2018 census methodology. The 2019 DHB telehealth survey reported that 15 DHBs cited lack of patient access to devices as a barrier for telehealth and twelve reported patients not having fast internet as a barrier.

Technology is a driver of the development of telehealth enabling health care services to be delivered at a distance. However, Shaw et al found that while the need to train staff in the new technology is usually recognised there is little acknowledgement by government and industry of the lack of access, skills or motivation of the target population (many of whom are poor, sick and elderly people) who cannot use the web and/or have no access to the internet. The authors suggest that approaching these health inequalities in social terms is "more likely to produce a more broad-based solution that includes assessment of the user experience, patient and carer needs and the use of co-design methodologies" (Shaw, Wherton et al. 2018). They contrast this approach with technology driven ones that tend to focus on the provision of particular technology - and digital literacy and connectivity in disadvantaged populations are seen as 'deficits' that can be fixed.

An aspect of telehealth that deserves further consideration is whether it does reduce health costs. The literature on cost-effectiveness of telehealth shows mixed results and many published studies are small or are likely to have been strongly influenced by selection and publication bias. The policy assumption is that technology is a way to achieve cost-savings, for example, by reducing staff time or supporting care for people at home. In many instances, however, embedding technology into organisational infrastructure requires "much time and effort, and many resources to achieve alignment with existing management and administrative structures, processes, and routines" (Shaw, Wherton et al. 2018). As such, the cost effectiveness of any telehealth system will always depend on a variety of factors and cannot be assumed.

Other research notes that the emergence of new telehealth-related capabilities presents "exciting opportunities to enhance value-based clinical care" (Tuckson, Edmunds et al. 2017). Benefits cited include continuous advancement in electronic health records and clinical decision-making support systems. Nevertheless, despite these opportunities, Tuckson et al found limited evidence regarding the effect of telehealth on health costs and utilisation. They concluded that "clinicians deserve access to a more complete body of evidence on telehealth care as they make important decisions with, and on behalf of, their patients" (Ibid, p1591). Researchers have also commented that limited data and information currently exist concerning health outcomes achieved for patients using telehealth. For example, (Ekeland, Bowes et al. 2010) found that despite many studies and systematic reviews on the effects of telemedicine, high quality evidence regarding the positive impact of telemedicine on clinical outcomes is lacking.

Considerable new evidence on the uptake of telehealth is emerging from the rapid shift globally to the remote provision of health care services necessitated by the Covid-19 pandemic. This final section examines the sudden adoption of telehealth.

Responding to Covid-19

Telehealth has become a key tool in many countries for preventing the spread of the virus and protecting health workers, while maintaining patient access to care. Most recently, Trish Greenhalgh, GP and Professor of Primary Care Health Sciences, Oxford University, explained the rapid implementation of virtual consultations in the NHS in terms of the concept of 'relative advantage'. In her view, whether and how quickly telehealth is adopted depends on whether it is an improvement on prior practice. In the Covid-19 context, the relative advantage of telehealth is, in Dr Greenhalgh's opinion, stark:

> "Until a few weeks ago, unless you lived somewhere really remote, it was easy to pop to the hospital or the GP. With COVID-19, if you're a patient and you go to a GP surgery or you're a doctor and you see patients face-to-face, there's a high risk of infection. Suddenly the relative advantage of virtual consultations has changed dramatically" (Greenhalgh 2020a)

Early in the global pandemic in New Zealand the health care system moved quickly to use telehealth services as it prepared for the worst. For example, 65% of outpatient services at the Manukau SuperClinic did 50 percent or more of their consultations through telehealth during Level 4 lockdown[3] (Ko Awatea, 2020). The restrictions that were put in place in New Zealand eliminated the threat of Covid-19. However, lockdown measures have since been reinstated due to re-emergence of community transmission.

In the UK, researchers found the pandemic led to a rapid transition to remote/digital health services for a large proportion of the population - moving to a 'digital by default' approach as remote and virtual consultations and appointments became the norm. It was recently estimated that 85% of consultations are being done remotely. Findings from the research include that remote consultations and technology can make significant improvements to general practice, hospital outpatient and mental health appointments. However, the research with patients showed that telehealth is not suitable for some people in certain groups - for example, people with sensory disabilities, language difficulties and mental health illnesses, such as autism. A concern raised is that a blanket approach will be taken that does not consider individual need and circumstance. It is suggested that "a blended offer, including text, phone, video and in-person would provide the best solution" (Health Watch National Voices 2020).

The assessment of the 'relative advantage' of in-person (kanohi ki te kanohi) consultations has been coloured by directives at a central government level in New Zealand discouraging in-person interaction wherever possible. The result of this was a broader uptake of telehealth, including in clinical contexts where it would perhaps not otherwise have found a foothold.

Existing trial research has focused on clinically stable patients requiring follow up, generally in a hospital outpatient setting and championed by keen practitioners (Greenhalgh 2020a). Early evidence since the pandemic has emerged suggests that, even in a Covid-19 context, there has been significant variability between specialities in the uptake of telehealth consultations[4] (Ko Awatea 2020). However, it also appears the pandemic necessitated the roll-out of telehealth to higher risk patients by clinicians who may not otherwise have considered utilising it as part of their practice (Greenhalgh 2020a).

Prior to the Covid-19 outbreak, data showed that 60% of interactions using teleconferencing in New Zealand DHBs was clinician to clinician and team sessions, with patients involved in 40% (NZ Telehealth Forum and Resource Centre, 2019). The number of pilots and planned telehealth services indicated that DHBs already intended to reverse these ratios with a significant shift in focus to video conferencing with patients. Commentators had considered this ambitious, judging DHB readiness for telehealth as variable and generally falling short in the capacity needed to meet current demand, let alone future demand (*Ibid*). This view was reiterated in the New Zealand Health and Disability System Review, released in June 2020, which advised that mechanisms for funding and incentivising providers to offer telehealth services need to be designed, implemented and sustained.

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[3] The majority of telehealth consultations were via telephone, and only a very small percentage (1%) were done via videoconference.

[4] The proportion of consultations delivered via telehealth by service ranged from 90% to 10%. This variation was not explained by the type of appointment (FSA or FU) in each specialty.

Despite these doubts, the Covid-19 pandemic may have accelerated achievement of, and expanded, existing telehealth targets. Some clinicians consider that, whereas telehealth had previously been viewed largely as an optional or exceptional means of delivering health care services, one of the lasting consequences of the pandemic will be that telehealth consultations will become mainstream (Boyages 2020). Furthermore, clinicians and patients have been given the opportunity to observe telehealth in action, and many are seeing that it works and is easier than anticipated (Greenhalgh 2020a).

In New Zealand, the telehealth experience may be more positively received, in part because our health system has not been overwhelmed with Covid-19 patients as has been the case abroad. In foreign jurisdictions, a key tenet of telehealth during the pandemic has been the provision of healthcare, en masse, to save time and prevent hospitals being inundated. The evidence from those jurisdictions should be considered in that high-stress context. In New Zealand, where the number of Covid-19 cases has been contained, we have not had the same pressure on our health system's capacity. Our experience with telehealth, while fast-tracked, has therefore been somewhat more measured and less stressed, which may positively colour individual clinician and patient perspectives.

Despite this theoretical advantage, early domestic evidence suggests the increased utilisation of telehealth during the pandemic has not been without its issues. A rapid review of the sudden shift to telehealth video and phone consultations in outpatient services at Manukau SuperClinic during New Zealand's government enforced lockdown highlighted several key challenges. These included technology deficiencies affecting equitable access; concerns regarding privacy and confidentiality of remote consultations; and difficulties modelling a whanau-centred, culturally safe care approach remotely. There was also a general lack of clarity, particularly from a patient perspective, regarding processes for telehealth consultations. These issues were however successfully mitigated in many instances by healthcare providers taking the time to provide clear explanations. For clinicians, the review identified that a shift to telehealth requires major changes in roles, routines and processes. Adjusting to these changes risks increasing clinician workloads, disincentivising the ongoing utilisation of telehealth (Ko Awatea 2020).

What lies ahead?

The experience has shown us that telehealth is certainly worthwhile in dealing with a pandemic or civil emergency; this knowledge and awareness will lead to greater uptake and the demand for telehealth services will continue to grow. However, the evidence supports the need for development of supportive systems and processes, scheduling, training, guidance and communication strategies for clinicians and patients to expand the use of telehealth as part of routine delivery of care. It is important to note that these strategies need to go beyond technical aspects to cover the whole care pathway and consultation process to ensure a culturally competent and health literate approach. Specific recommendations from the Manukau SuperClinic review include standardising the roll out of telehealth to create a uniform selection criteria, and developing a systematic approach to monitoring and evaluation (Ko Awatea 2020).

Overall, the evidence abroad and in New Zealand indicates a positive reception to telehealth in a Covid-19 context. Despite this, there is evidence to suggest patient expectations are that the provision of health care services will return to conventional modes post-pandemic (KoAwatea 2020). In New Zealand, there has been some indication that a 'business as usual approach' - reverting to the historically necessary model of in-person interactions - returned following the lifting of Level 4 restrictions (*Ibid*). To achieve a successful, permanent transition to telehealth a quality improvement mindset will be required (Greenhalgh 2020b). The focus must be on providing a better service, rather than providing a technical solution. In short, the 'relative advantage' of telehealth must persist in the absence of a novel pandemic crisis, from both a patient and clinician perspective.

At the very least, the Covid-19 experience will produce a body of data that can be used to assess whether and how telehealth can be implemented to improve health care services. While that data will always need to be considered in the novel pandemic context in which it has emerged, it is not without value and should not be disregarded.

The public health system in New Zealand lacks the capacity to enable the shift to telehealth to be sustainable. Successful embedding of telehealth will depend on a multiplicity of factors, including appropriate resourcing. Health is a complex adaptive system where a 'plug in and play' approach to adopting technology does not work. A whole-system strategy is required that includes enabling and supporting clinicians to influence the adoption of telehealth in their service and to ensure that digital healthcare is focussed on patient needs.

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