Adoption of ICT Enabled Telehealth Services in the Australian Context: Implications of Technology Use for Telehealth Workers

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Abstract
This study investigated the major issues and challenges associated with ICT enabled telehealth service delivery from the point of view of workers engaged in telehealth delivery in Australia. Through intensive interviews with telehealth workers across three case study organizations, the study examines the types of technology employed to deliver ICT enabled health care, as well as implications of technology use in the health care environment, particularly as they relate to workers.

1. Introduction

There have been a large number of studies and systematic literature reviews on using information and communications technology (ICT) to deliver health services (terms include: telemedicine/telehealth/ehealth/telecare) over a period of forty years [1][2]. Globally, the increasing number of elderly, those with chronic disease and those with multi-morbidities (co-occurring diseases) is leading to an increase in demand of health care services and thus increased health costs [3].

The global adoption of ICT enabled health care services has been slow and although there have been many trials, for example telemonitoring of chronic health conditions, there is little evidence that evaluates the success or otherwise of health services being delivered this way for stakeholders including patients and their families, health care providers and government [2][4]. Since there is limited access to specialists in rural and remote areas and given that technology is readily available and relatively inexpensive (for example Skype and webcam), Australia should be a good candidate for ICT enabled health care delivery [5][2]. Health is the second largest expenditure for the Australian government and the health sector is the largest employer in Australia. Health spending has trebled over the last 25 years [6], and telehealth is increasingly regarded as a means of addressing the growing costs of health care delivery. In the Australian context, the Department of Health allocated $A20.6 million to nine telehealth projects in 2012 with the objective of reviewing how telehealth services could be used in the home, particularly for aged care, palliative care and cancer care [7].

In addition, the Commonwealth Scientific and Industrial Research Organisation (CSIRO), recently received two grants worth more than $A5 million for two projects in the Broadband-Enabled Telehealth Pilot Programs from the Australian Government, one for Home Monitoring of Chronic Disease for Aged Care and the second for Satellite Broadband-Enabled Indigenous Tele-Eye Care [8]. Although the outcomes from the nine projects are not yet available, all are monitoring clinical outcomes and the effectiveness of the technology [9]. As Dods et al. [6] suggest, analysis of these programs and their outcomes is essential; through understanding how both patients and health workers use the health system, better quality health care can be provided at a sustainable cost. However, the adoption of ICT enabled health care delivery in Australia to date has been gradual and fragmented [2]. While metropolitan areas have access to fast, reliable broadband connectivity, rural and remote areas do not, and this has been a significant barrier to the adoption of universal ICT enabled health care in Australia [10].

The Australian Government’s fibre-to-the-premises (FTTP) architecture (the National Broadband Network or NBN) strategy was to provide the foundation for new broadband-based services and applications, particularly in health and education [11]. The NBN policy was to deliver high-speed broadband fibre-optic connection to 93% of the Australian population, with the rest having access to wireless and satellite internet [10]. The other related policy was the introduction and development of e-Health applications [10]. More recently with a change of government in September 2013, the future of this project is in doubt with a strategic review currently underway.

Fast, reliable broadband as part of the technology infrastructure is an important prerequisite for ICT
enabled health care delivery. Once the technology infrastructure is in place, the success of ICT enabled health care delivery depends on the clinical and administration systems supporting it [5], as well as the health care professionals who attend to patient needs [3]. That is, the technology should not be the driver of ICT enabled health care delivery services. For example, Peirce et al. [12] found that telemonitoring was a technological push driven by commercial interests rather than a well-considered analysis of patient care needs.

Patients, particularly those in rural and remote areas, benefit from ICT enabled health care delivery because they do not have to travel to see specialists, the social dislocation of families is minimized, costs related to travel, accommodation and other living expenses are lower, and there is improved access to services and improved quality of care [13]. The inequality of health care provision associated with rural and remote areas including indigenous communities could be resolved, at least in some part, by ICT health care delivery [14]. Health care providers benefit from access to improved training and professional development opportunities, collaboration opportunities and enhanced technology skills [13].

The research is scant on the implications of ICT health delivery from the perspective of the workers delivering these services. Health care providers work from a variety of locations such as their homes, from call centres and health clinics. Roberts et al. [14] point out that workers who interact with clients to provide ICT enabled health care services have specific skills and capabilities to be able to provide the required level of care in an effective and efficient manner.

This exploratory study examines the major issues and challenges associated with ICT enabled telehealth service delivery in the Australian context from the perspective of the health care workers; hence, this research fills a gap by focusing solely on the perceptions and experiences of telehealth workers involved in the flexible delivery of ICT enabled health care services. While a number of government and organizational reports address the benefits of telehealth adoption in Australia, there is very little empirical research in the area, particularly from the point of view of telehealth providers.

2. Literature Review

ICT in healthcare promises to reduce costs and improve healthcare outcomes; however the adoption, use and diffusion of ICT in health care is low in comparison to other areas of our lives such as work and leisure [15] [4] [16]. Government policy is targeted at improving the quality of the health of citizens, including those that are isolated. For example, citizens may live in remote areas, be prisoners, work in the armed forces or at sea [13]. In addition, aging populations and unhealthy lifestyles have led to an increase of chronic health conditions in many parts of the world [17]. The priority of health care delivery is changing from curative goals to more palliative services such as symptom control, mobility, autonomy, social inclusion and quality of life [3]. These factors contribute to the increasing costs of healthcare provision.

There are a number of terms in the literature, for example ehealth, mhealth, telehealth, telemedicine and telecare that refer to the flexible delivery of healthcare using various forms of ICT. ‘Tele’ from the Greek means distant [18] which encompasses all the terms in use. For the purposes of this paper, we use the term telehealth from van Dyke's work to include telemedicine (the curative) as well as preventative and promotive aspects [4]. In a draft National Telehealth Strategy for Australia, telehealth is defined as: ‘enabling health care services and related processes delivered over distance, using information and communication technologies’ [19]. More specifically, telehealth is the use of ICT to deliver health care and health information across distances to mitigate issues relating to inequality of health care resources. Telehealth relies on the transmission of data, voice, images and video, and can also involve mobile and web technologies [14].

The adoption of telehealth is complex and involves more than just technology, although the choice of technology is crucial for sustainable telehealth adoption [20]. Issues identified in the literature include: managing stakeholder expectations, integrating telehealth work processes with standard health processes, lack of frameworks for knowledge sharing, developing effective and social communication patterns and difficulties of working in a virtual team [14] [16]. ICT delivery of health care services is predominantly driven by technology rather that the clinical problem leading to a major barrier to successful adoption [2]. The adoption of ICT in telehealth is also constrained by the lack of integration of new technologies in clinical practice workflow and daily activities [21]. ICT delivery of health services can be difficult to measure for effectiveness and efficiency because it is a process, rather than an intervention such as surgery or a prescription for a drug [2]. For example, a telehealth consultation with a specialist may be beneficial for the patient because they do not have to incur the costs of travel, accommodation and time off
work. However, it is unclear what the benefits to the specialist may be.

In research that examined diffusion of innovations, governance and impact for deployment of ICT in telehealth across eight countries in the European Union (Denmark, Estonia, Germany, France, Italy, Netherlands, Spain and the UK.), Lluch and Abadie [17] found that telehealth deployment in the UK relied on both technological and organizational innovation. ICT accounted for ten per cent of innovation with ninety per cent attributable to organizational innovation. Some health care professionals, particularly general practitioners (GPs) were reluctant to use ICT enabled health care delivery because they were concerned about losing touch with their patients. Nurses were the main coordinators of ICT enabled health care because they were responsible for interacting with GPs, other health care providers, call handlers and technology. The low interest from GPs of adopting the technology provided nurses with an expanded role in delivering health services. The reasons for the reluctance included lack of appropriate incentives, the threat to the doctor-patient relationship and liability issues [17]. Adoption and diffusion of telehealth technologies requires cultural and behavioral changes [21].

Providing care from a distance to older people living at home is a relatively new area of telehealth delivery. Care packages that provide support for older people or those with chronic health conditions to stay in their homes include both a physical care component (for example, wound dressing, help with meals) and a telecare component (for example, environmental monitors, alarms, phone calls and video calls) [22].

In the Australian context, telehealth services effectively began with the flying doctor service in the 1920s. Since 2011, the Medicare Benefit Schedule (MBS) has item numbers for video-based consultations between general practitioners, nurse practitioners, midwives, Aboriginal health workers and specialists. This is only for real time video consultations and does not include allied health professionals [2]. In Australia, health care, particularly for specialist care, is expensive for those living in rural or remote areas. It either involves costly and inconvenient travel to metropolitan areas by individuals and their families for health care specialists or specialist teams travelling to outreach clinics [5]. The challenges for telehealth adoption in Australia include healthcare workforce shortages, funding challenges, the decreasing cost and advancement of ICT and the vast open spaces of rural and regional Australia [13]. Although several studies

anecdotally reported cost savings for patients using the telemedicine option, only one study by Smith et al. [23] measured this.

Research in Canada examined the impact of telehealth on recruitment and retention of both physicians and nurses in rural and remote areas [24] [25]. They found that technology alone is unable to solve workforce shortages.

In the UK, a study examining telehealth adoption from the perspective of nurses found that the disruption of the technology related to three key areas. The first was the daily work routines, the second was the interaction with their patients and the third was skill set and expertise. The skill set and expertise was particularly troubling because nurses felt that they were undermined and not adequately trained [26].

Moffatt and Eley [13] found in their review that there were also benefits for rural health professionals, including local access to continuing education and professional development activities, the ability to provide an enhanced local service, and indirect benefits through experiential learning from close contact with specialists in clinical work. Additional benefits reported included the reduced perception of social isolation, improved communication and increased skills and confidence with ICT, all of which may lead to more effective rural health workforce recruitment and retention [13]. However, service workers based in call centres have a different experience. Work is highly controlled by practice protocols and is time-managed through computerized performance monitoring and call recording. These types of jobs can be very demanding and clients can often be verbally abusive and make complaints [14]. The literature does not provide standard metrics to assess the quality of service in telehealth and this makes the evaluation of technology adoption in telehealth problematic [21].

3. Methodology

This exploratory study used data derived from three intensive case studies of Australian organizations delivering various telehealth services, that is, delivering health care services and information across distance through various forms of ICT. The purpose of the study was to explore the perceptions and experiences of teleworkers engaged in ICT enabled health care delivery. The following overarching research question indicates the scope and depth of this research:

What are the major issues and challenges associated with ICT enabled telehealth service
This research question seeks to identify major themes concerned with ICT enabled telehealth delivery from the perspective of telehealth workers. Rather than pre-empting the dialogue, such an investigation allows for the perspective of telehealth workers (as opposed to other stakeholders) to be revealed, including feedback regarding telehealth workers' perceptions of both the benefits and limitations of ICT enabled telehealth delivery for a variety of stakeholders. This includes patients, telehealth workers and other medical professionals, organizations, government and society as a whole.

Three intensive case studies of organizations engaged in the delivery of ICT enabled health care were utilized for this study. Pseudonyms have been used in order to ensure anonymity of the participating organizations. The first case organization, Aged and Community Care (ACC), is a not for profit, community owned organization with a mission to assist older people to 'live their lives, their way' by providing care that encourages independence and social connectedness for as long as possible. The organization employs approximately 400 employees and provides services to over 3,000 clients living in 23 Local Government Areas in the states of Queensland, New South Wales, Victoria and Tasmania in Australia. From an ICT perspective, ACC is an organization that embraces the use of smart technologies, innovative service delivery models and sustainable business practices. ACC is an early adopter and innovator of ICT in telehealth delivery of services. ACC provide staff engaged in telehealth delivery with smart phones, laptops and multifunction printers and provide IT support 24 hours a day.

The second case study, Triage Nurse Services (TNS), is a telephone service that operates across the whole of Australia that anyone can call at any time, 24 hours a day, 7 days a week, to speak to a registered nurse. The registered nurse, based on the caller's symptoms, provides advice and referral services, but cannot diagnose. TNS has been in business since 2007 and works with partner organizations to deliver the triage service, funded by the Australian government. TNS puts out tenders for the triage telephone service. The successful partner supplies the employees and the supporting ICT. The registered nurses who work from home are provided with a dedicated ADSL connection, a computer, headset and phone. Nurses involved in this telehealth service handle over 3000 calls a day across the country, with over 1600 health professionals working from home, including the triage registered nurses.

The third case study, Home Care (HC) is a not for profit organization that provides healthcare services to nearly 10,000 people each day in Victoria, New South Wales and New Zealand. There are over 1600 employees, with 1200 of those nurses. Clients are of all ages, from children to the elderly. HC have been utilizing ICT to interact with clients via videoconferencing, replacing some home visits by nurses. A relatively recent customer service centre, staffed by nurses, monitors in real time client’s data such as blood pressure, blood oxygen, temperature, blood glucose and weight from a home monitoring system.

The application of a case study methodology, often utilized in social science research, was chosen for this study because case study research is highly appropriate in settings with a variety of overlapping scenarios and discourses. The robustness of case study approaches is dependent on the careful selection of appropriate cases as well as the application of relevant case study principles and practices. Since three organizations were involved in this study, the use of case study analysis techniques relies on replication logic rather than the uniform logic that would characterize results from a single case study. By applying cross-case analysis, construct validity and reliability are increased, as is the overall generalizability of the findings [28].

The sampling methodology in this research was purposive in the sense that the researchers were seeking cases where a significant proportion of client service delivery involved ICT enabled telehealth practices, allowing telehealth workers to work flexibly, from a variety of locations other than a dedicated office. That is, to have the potential to 'work anywhere'. This might involve working from home, from clients' homes, a call center, other locations or on the road. Moreover, these organizations invested significant resources in ICT for telehealth delivery.

The purpose of this exploratory study was not to offer generalizations based on statistical analysis, but rather to generate a bank of rich data in order to identify major themes and subthemes [28]. Given that construct validity is essential in multiple case studies [29], the research utilized constructs used in previous research [30] [14]. Using case study protocols recommended by Yin [31] [32], a set of stem questions guided participant discussion during the interview. These include the following:

- How are ICTs utilized to support telehealth delivery in your organization?
• What is the technology that you use that supports telehealth delivery?
• What are the benefits and limitations of ICT to support telehealth delivery?
• How does telehealth delivery impact on the level of service delivery to patients/clients?
• How does telehealth impact on your productivity?

Between 8 and 12 telehealth workers were interviewed in each organization, in addition to at least two managers, with a duration of 60 to 75 minutes for each interview. The participants were recruited through email. The number of interviews was sufficient because we reached a saturation point in each case, that is, the answers were similar from both the nurses and their managers. The interviews yielded multiple perspectives concerning the issues involved in telehealth delivery. A method of textual analysis, often used in social science research, utilized a coding system where data was placed into a number of predetermined categories by the researchers and grouped across a range of patterns or themes that emerged from the interviews [25]. For each of the interviews, other documentation was also used to enrich the study, including annual reports, business and government reports, as well as material available in the public domain.

4. Findings and Discussion

A number of themes emerged from the interviews including issues related to technology use, as well as well as the implications of using technology in the delivery of telehealth services. With regard to technology, it was clear that each of the organizations had a well-developed strategy dealing with technology. In each case, telehealth service delivery was dependent on technology, so business models were underpinned by a robust strategy linking various aspects of technology with telehealth delivery, including technology provision, use, training and support. A major concern for each of the organizations was the uncertainty regarding access to high speed digital broadband services, reflecting the current controversy concerning the rollout of the National Broadband Network across Australia and a change of policy regarding the NBN since the federal election in late 2013. There were many concerns relating to a lack of high speed broadband services in some locations which resulted in slow or poor quality connections, and in some cases, no connection at all.

All interview participants, whether managers or telehealth workers, expressed the view that high speed broadband connectivity was absolutely essential to the future of telehealth delivery.

Another theme relating to technology concerned the need for training and support relating to the use of various technologies involved in telehealth service delivery. This included training for telehealth workers, for managers and in some cases for patients who required training to use equipment such as computers, tablets, blood pressure or blood glucose monitors and the like. Without adequate training, the effective use of technology to support telehealth could be compromised. In order to support telehealth workers, strong IT support is necessary, and in each of the case study organizations participants reported having IT support on a 24 hour, seven day a week time frame. This was considered essential in order to ensure seamless telehealth service delivery, because all of the case organizations were involved in around the clock delivery of some or all of their services.

Communication was another significant issue raised by interview participants. Technology to support communication between clients and telehealth workers, between workers and management, and across the organization was considered an essential part of the service delivery model. This technology consisted of a variety of equipment and facilitation methods, including computers, videoconferencing, emails, landline and smart phones. A list of technology and equipment utilized by the three case study organizations appears in Table 1 below.

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<th>Technology/equipment</th>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
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<tr>
<td>Internet access</td>
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<td>High speed broadband</td>
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<td>Fax machine</td>
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<td>Computer camera</td>
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<td>Specialized software</td>
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<td>Blood glucose machines</td>
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Table 1. Technology and equipment used in Telehealth delivery

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<tr>
<td>Scales</td>
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<td>Pulse oximeters</td>
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<td>Sensors and alarms</td>
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Given that technology forms the backbone of telehealth service delivery, it is not surprising that the technology-related issues were raised by participants from each of the case study organizations. However, what was unexpected was the number of issues raised by interview participants that were largely unrelated to technology. These included concerns regarding worker/client interaction, employee management (from both a management and worker perspective), and service quality implications.

In terms of interaction between telehealth workers and clients, there was a strong feeling that the quality of the interaction is dependent on effective communication. Technology has the potential to either enhance or detract from communication exchanges, thereby affecting the relationship between workers and clients as well as the overall perception of the quality of the telehealth delivery. For instance, the technology allows workers to keep in touch with colleagues and managers, and allows them to make contact with patients on a more regular basis. However, a phone or skype call cannot replace a face- to- face meeting with a patient, particularly when a diagnosis is required. Clearly, clients will have expectations regarding the nature of the telehealth delivery, as well as the service quality. These expectations need to be carefully managed.

Several issues related to employee management were raised by both managers and telehealth workers. There was a strong perception that the use of technology increased productivity across the various forms of service delivery, except in instances where the technology failed or where high speed digital broadband was not available. The flexibility associated with telehealth delivery also contributed to better work-life balance for many of the participants, particularly those with families or other responsibilities outside work. Some participants at a later career stage reported that the technology allowed them to remain in the profession and continue working from home, even if they were no longer able to respond to the physical demands of working in a clinical nursing environment, for example a number of participants had back problems and could no longer work in a hospital environment.

A limitation articulated by many of the interviewees was that they had moved from an active to a passive job. For example, working in an emergency department in a hospital involves working in a team and moving quickly around the hospital. Conversely, telehealth service delivery involves sitting for the whole shift. Some interviewees reported that they had put on weight since moving to a work from home arrangement because they were sitting all day and had access to the kitchen.

Some 35% of telehealth workers reported feeling a sense of social isolation due to working largely on their own, either from home or on the road. For some, there was a big transition required from working in clinical team settings to working alone. However, this did not pose an issue for the majority of the participants who seemed satisfied with the mechanisms in place in their organizations for keeping in touch with managers and co-workers. This included use of social media, phone calls, emails, as well as face-to-face opportunities to meet on a regular basis.

Employee support was considered an essential part of telehealth workers’ motivation and wellbeing, and strengthened both communication processes and the organizational culture as a whole. Still, a small number of those interviewed stated confidentially during the interview that they were looking for another job; the most predominant reason given was that they felt unsuited to working alone all the time, often interstate, with very little communication or interaction from manager or head office.

It would appear that the most successful and satisfying telehealth work arrangements are those that allow for regular interaction with managers and co-workers as well as with clients/patients. This included providing opportunities to debrief, particularly after a difficult client interaction. Telehealth workers expected such support to come from management. In one of the case study organizations, workers reported that management did an exceptional job in this regard, but in the other two organizations, management were less highly regarded, particularly in terms of valuing staff and providing support. Several respondents were unhappy with feedback mechanisms in their respective organizations, expressing a desire to obtain more feedback on their own performance, as well as on patient status, on a regular basis.

Most telehealth workers in this study were registered nurses. Many of them felt there was a lack of uptake on telehealth delivery by other medical professionals, particularly GPs. There was a strong feeling that the potential of ICT enabled health care delivery could be realized to a much higher degree if GPs in particular were more enthusiastic about adopting telehealth delivery. Issues relating to work, health and safety were also raised by respondents in all the case study organizations.
The most general concern was that of on-the-job stress, leading to a negative impact on their sense of wellbeing. Various reasons for on-the-job stress were cited, including difficult cases and clients, isolation in the job and lack of support (social and professional isolation). However, the technology was also cited as a cause of stress when there were breakdowns or technical difficulties.

Respondents overwhelmingly perceived that there are high levels of client satisfaction with telehealth delivery. ICT enabled health care delivery resulted in lower costs of delivery, less travel and disruption for clients, and an overall reduction in hospital and GP visits. Moreover, telehealth services allowed aged clients and those managing chronic health conditions to remain in their homes for longer, thus delaying the need for residential aged care and admissions to hospital.

However, workers stated that telehealth delivery could not replace face-to-face interaction 100% of the time, and suggested that a balance needs to be struck in this regard. It also became clear in speaking with telehealth workers that adoption of technology to support health care delivery requires new and different ways to monitor and measure service delivery in many instances, the technology itself could be used for the purposes of monitoring, measurement and evaluation.

**5. Implications**

While ICT enabled delivery of health care services shows great potential, its success is heavily dependent not only on technology, but also on users of that technology. The promise of technology to support telehealth services is huge: delivering cost and time savings, allowing for increased frequency of service to clients, greater flexibility of delivery, streamlining of administration processes and enhanced client/worker relationships. However, the effective use of technology is dependent on a number of factors. This includes the availability of a high-speed, reliable digital broadband infrastructure.

Success with ICT enabled health care delivery starts by being embedded in an organization’s strategic plan or business model, and supported by management. Training and induction, as well as ongoing IT support, are also required. The most successful of the case study organizations not only provided sophisticated technology at no cost to telehealth workers, they also provided extensive training in the use of the technology, as well as 24/7 IT support to minimize downtime due to technical difficulties.
A significant implication of this research is that the adoption of technology changes the face of traditional health care delivery and creates as many challenges for telehealth workers as it purports to solve. For instance, it is clear that ICT enabled health care delivery requires different forms of communication from traditional health care delivery contexts in order to realize its full potential. This not only requires the use of sophisticated technology to support communication, but also opens up the need for a variety of means by which to support and encourage employee-client and employee-management exchanges and feedback.

In terms of employee-client interaction, expectations need to be carefully managed. For example, an interaction with a triage nurse provides advice, not a diagnosis. Good employee-client relationships are dependent on seamless technology use and good communication. Moreover, the technology can enhance communication between workers, managers, colleagues, and other health care providers.

From the perspective of employee management, technology enhances productivity, but only when there is sufficient digital infrastructure and there is adequate training and IT support available for telehealth workers. Management support is essential to successful ICT enabled health care delivery. A supportive culture can keep workers motivated and engaged. This requires effective mechanisms for providing feedback on performance. Feedback on the status of clients is important for job satisfaction and engagement, for example, was the intervention satisfactory and did it solve the needs of the client? Other types of employee support include having the ability to debrief after a difficult interaction or experience with a client.

From a human resource management perspective, it is important to bear in mind that a telehealth employee's suitability for the job (or employee job-fit) should be carefully evaluated prior to engaging them in ICT enabled health care delivery. Having technological expertise and/or the requisite skills is not necessarily enough for a health professional to be successful in a telehealth job, given that many of these employees work in isolation and often with little opportunity for face-to-face interaction with colleagues. This may be a source of stress for some telehealth workers, particularly those with a high need for social interaction in the workplace. Since many telehealth workers we interviewed often worked long shifts, the ability to achieve adequate work-life balance may be in jeopardy. Overall, work, health and safety issues should be taken into consideration, not only from the perspective of interacting with clients, but also in the context of the ways in which the work is actually done by telehealth workers.

There are a number of stakeholders in the delivery of health services using ICT: the client/patient, the telehealth worker, management/organization and government. Service quality is increased for the client/patient if the technology provides the opportunity for more frequent interactions. Using ICT to interact with health care providers relies on the client/patient being proficient with the technology. Importantly, ICT can be less intrusive for the client. Rather than waiting at home for the health worker to visit (who may be delayed because of traffic or other holdups), the telehealth worker is more likely to call at the scheduled time and take less time for the interaction. The client can then get on with their day. However, if the technology does not work (or not work as intended) or the client cannot use the technology, the client/patient may feel the service delivery is inadequate.

The telehealth worker is able to ‘see’ more clients using technology, particularly those in community nursing and other roles where face-to-face visits are required. This has an impact on both service quality and productivity because of reduced travel time and the potential increase in the number of interactions, because ICT interactions are cheaper than face-to-face visits. The frustration of the technology not working adequately can hinder the ability of the telehealth worker to provide the service required. Using technology for more frequent interactions can provide opportunities for early intervention, for example, before the client is at the point of hospitalization.

The literature on teleworkers/flexible workers shows that a hybrid model, where workers work some time in an office with colleagues and some of the time at home or another location, is ideal for employee productivity and engagement [30]. In this study, most of the telehealth workers worked exclusively from a home office. In case study 1, there were opportunities to meet colleagues face-to-face each month, however not all employees took advantage of this opportunity. In case study 2, there were no opportunities for face-to-face interaction because workers were much more dispersed across the country. Many workers are located in rural and regional areas, particularly in case study 1 and case study 2, making the hybrid model impractical.

The challenge for managers is how to keep workers engaged with their organization and provide the right level of support when there is either no or limited opportunities to develop relationships face-to-face. Technology can provide a mechanism for
providing information, for example a company intranet, newsletters and enterprise social media. Management need to manage the amount of information that is being distributed. In case study 1 in particular, some interviewees found that there was too much information to take in on top of their day-to-day tasks.

Although mechanisms are in place for employees to access support through their team leaders and managers, this is only successful if there is a relationship there to begin with. That is, if there are no opportunities to form relationships and develop trust, it makes it difficult for an employee to reach out and ask for help. This may increase feelings of social and professional isolation. Support for employees who experience a distressed caller or other confronting situation, is particularly important. If the employee is in a team situation, for example in a call center, colleagues are likely to notice and provide support, even if it is a quick ‘are you okay’. This issue is more acute for telehealth workers (as opposed to office workers in other industry sectors such as banking and finance) because of the type of calls which can be distressing.

From a management/organizational perspective, ICT provides better utilization of resources without compromising service quality. Highly trained registered nurses can do some of the monitoring of a client using ICT and community health workers can provide the hands on services on a day-to-day basis. Governments, with rising health budgets, need to provide quality health care services at a sustainable budget level. Although the promise of ICT is to deliver quality health care and at the same time contain costs, it is not clear if this will be the outcome.

6. Conclusions

There are a number of challenges and limitations for telehealth delivery from the point of view of the workers that need to addressed. The use of the technology

For as many problems as ICT enabled technology adoption may be able to address in health care delivery, new challenges related to the use of that technology arise constantly. Many of these issues do not involve the technology itself, but rather the users of the technology. Although the political issues relating to the rollout of the NBN might be unique to the Australian context, many countries are grappling with how to develop ubiquitous broadband infrastructure to support the delivery of health care services, education and support other industry sectors to be globally competitive. There are a number of issues raised by this exploratory research that are more generic in nature and have wider applicability including global implications.

With most developed economies faced with a rapidly ageing population and a sharp rise in chronic disease, governments are struggling to respond to the increasing demands on existing health care systems. Given this societal trend of ageing populations and people living longer in general, health care costs are rapidly increasing. A holistic approach is needed in response to this situation, involving consideration of ICT, employee-client interaction, employee management and service quality.

Another issue unique to telehealth workers delivering health care services is that their clients/patients are also remote, often in rural and regional areas.

Australia is rolling out fast broadband capability to the majority of its population (regardless of the final form this will take). This makes Australia at the cusp of opportunity for using fast broadband to develop telehealth initiatives and applications to manage the health budget and provide a better quality of health care for its citizens. The tyranny of distance may be solved to some extent if the technology infrastructure is robust enough to facilitate the delivery of telehealth services. Technology has clear benefits in terms of cost savings, allowing more frequent, equitable and better service.

However, once the technology infrastructure is sufficient, the employee issues need to be considered including the client-employee interaction and the perception of the quality of delivery of the health service. Not only is there an aging population in general, but an aging workforce. This does not mean that face-to-face interaction is not important. Clearly, in many situations, a client/patient will need to physically attend a consultation. It will be important to assess when it is appropriate to use technology for an interaction and when it is not. That is, telehealth should not just be a cost saving measure without consideration of the client/patient needs.

The themes identified in this exploratory study need to be examined and tested in a wider sample of health care professionals. The next phase of this research examines telehealth from the perspectives of general practitioners, specialists and other allied health professionals. The backdrop of an ageing population, declining uptake in the nursing profession, government policy and broadband infrastructure issues means that there are implications for Australia as a whole, but some of these issues also impact society on a global level.

7. References


[18] See http://dictionary.reference.com/browse/tele-


