



FEROS CARE'S MY HEALTH CLINIC AT HOME PILOT SUMMARY REPORT

TO THE DETAILED FINAL REPORT BY SOUTHERN CROSS UNIVERSITY

SEPTEMBER 2014

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We wish to acknowledge the 200 seniors and their families who enthusiastically participated in the pilot.

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1. INTRODUCTION

Feros Care is a community owned, not-for-profit organisation that has been offering quality care and lifestyle support for older Australians since 1990. Feros Care’s mission is to be an ambassador and partner in the lives of seniors, with a focus on creating a range of lifestyle options that support independence, social connectedness and healthy ageing. Feros Care provides a range of residential and in-home services for seniors and has been delivering technology based solutions for clients since 2009.

To support their mission, Feros Care developed a virtual case management model, My Health Clinic At Home (MHCAH), designed to support seniors who have chronic conditions, are socially isolated and/or have limited access to adequate health support services due to remoteness. Based on the MHCAH model, Feros Care was a successful applicant in the National Broadband Network Enabled Telehealth Pilot in 2012. The purpose of the pilot was to demonstrate the innovative use of NBN enabled telehealth technologies in keeping seniors linked and connected remotely to their health professionals, community support, families and friends, with daily monitoring of their condition and wellbeing from their own home. The pilot was funded by the Australian Government Department of Health (DoH) under the National Digital Economy Strategy.

The initial target population for the pilot was residents of Coffs Harbour, New South Wales (NSW) who have a chronic illness and access to the NBN. The pilot was subsequently expanded to residents of the Gold Coast in Queensland (QLD) and the Far North Coast of NSW who did not have access to the NBN but could access alternative high speed options such as 4G.

This report provides a high level abridged version of the detailed Evaluation Report by Southern Cross University “Feros Care’s My Health Clinic at Home Pilot Final Report” published in September 2014. [8]





2. AIMS AND OBJECTIVES

The vision of the MHCAH pilot program was to showcase the use and demonstrate the benefits of how the NBN and telehealth can offer a complementary virtual health service model for seniors. Specifically, the MHCAH pilot aimed to:

- Provide a virtual case management model that would assist key stakeholders to remotely support seniors with chronic conditions, at home; and
- Demonstrate the innovative use of the NBN enabled telehealth technologies to keep clients easily linked and connected remotely to their health professionals, community support, family and friends, with daily monitoring of their condition and wellbeing in their own home.

The project objectives were to:

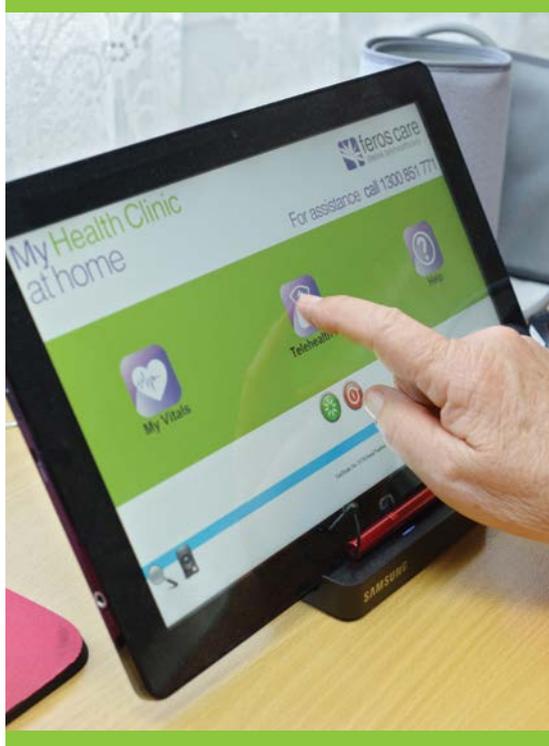
- Improve access to health services – Providing timely and efficient access for General Practitioners (GPs), case managers, allied health personnel and other health professionals, through virtual consultations with seniors in their homes.
- Facilitate daily monitoring of health conditions – Assisting seniors to successfully better manage their condition(s) by daily remote vital signs monitoring and personalised support remotely by a Telehealth Registered Nurse (THRN).
- Improve data – Providing extensive trending data of vital signs over a continuous period for GPs and other health professionals to manage and improve medical decisions.

- Enable early intervention – Facilitating early detection of changes in health condition, enabling early intervention and triage, thereby reducing hospital admissions.
- Reduce social isolation – Assisting seniors to build and maintain regular support networks of family and friends, whilst providing socialisation opportunities to reduce isolation and improve support structures.

The scope of the MHCAH pilot was limited to 200 clients, recruited from the 1 April 2013 until 30 June 2014. The MHCAH pilot was originally designed to operate solely in the Coffs Harbour Local Government area with clients connected to the NBN. However, following the change of government in 2013, the scope of the pilot was extended to clients outside the NBN region, allowing other technology platforms such as 4G and ADSL2. Consequently, the project included Feros Care clients from the Gold Coast, QLD and Far North Coast of NSW using 4G internet connections.

The goals of the evaluation by Southern Cross University were to:

- capture the extent to which the ubiquitous, high capacity, reliable connectivity of the NBN increased the benefits of access to high-quality healthcare services, and enable health services to be delivered in the home;
- explore the productivity impacts of NBN-enabled telehealth services; and
- describe the way that high-quality healthcare services in the home influenced the health outcomes of participants.



3. MY HEALTH CLINIC AT HOME TECHNOLOGY OVERVIEW

3.1 MHCAH TELEHEALTH MONITOR

All participants recruited to the study were provided with and trained in the use of the MHCAH monitor. This consisted of a touchscreen tablet or all-in-one computer which integrated with a set of patient care peripheral, such as weighing scales, blood pressure monitor, blood glucose monitor, thermometer and pulse oximeter.

The MHCAH monitor displayed large, touch-screen icons allowing easy access to applications for clients, including:

- **My Vitals** for conducting health checks
- **Telehealth Nurse** for convenient video calling the Telehealth Registered Nurse (THRN); and
- **Help** for calling the technical support team

Additional customised icons could be added to video call other stakeholders including family, friends and case managers. The tablet was personalised by the onsite installer or remote technology support staff to accommodate the participants' needs, such as different vital signs monitoring setup, helping participants to video conference their family members, access health education sessions, adjust volume control, or install a larger unit for vision impaired participants.

Figure 1: My Health Clinic At Home features



3.2 TRIAGE MONITORING

The MHCAH monitor interacted with the participants via a daily client “interview”, providing voice prompts for each vital sign measurement, and requesting clients’ responses to a customised set of health-related wellness questions. The monitor then sent the results immediately via the internet to a secure website where they were monitored by Feros Care’s Telehealth nurses.

The triage website would automatically categorise the participants into green/amber/red based on the results of their daily interview. If the vital signs results were outside of range, there would be a red

alert. If the vitals were within range, but there was a negative response to the participant’s wellness questions, there would be an amber alert. If vitals were within range and wellness responses were positive, a green indicator was assigned. Each day, Feros Care’s Telehealth nurse would review the results and follow-up with the participant, escalating to the participant’s GP or health representative where necessary. The Telehealth nurse would also provide the GP or health professional with a graphical report of trends in participant vitals on a regular or ad-hoc basis (as determined by the health professional).



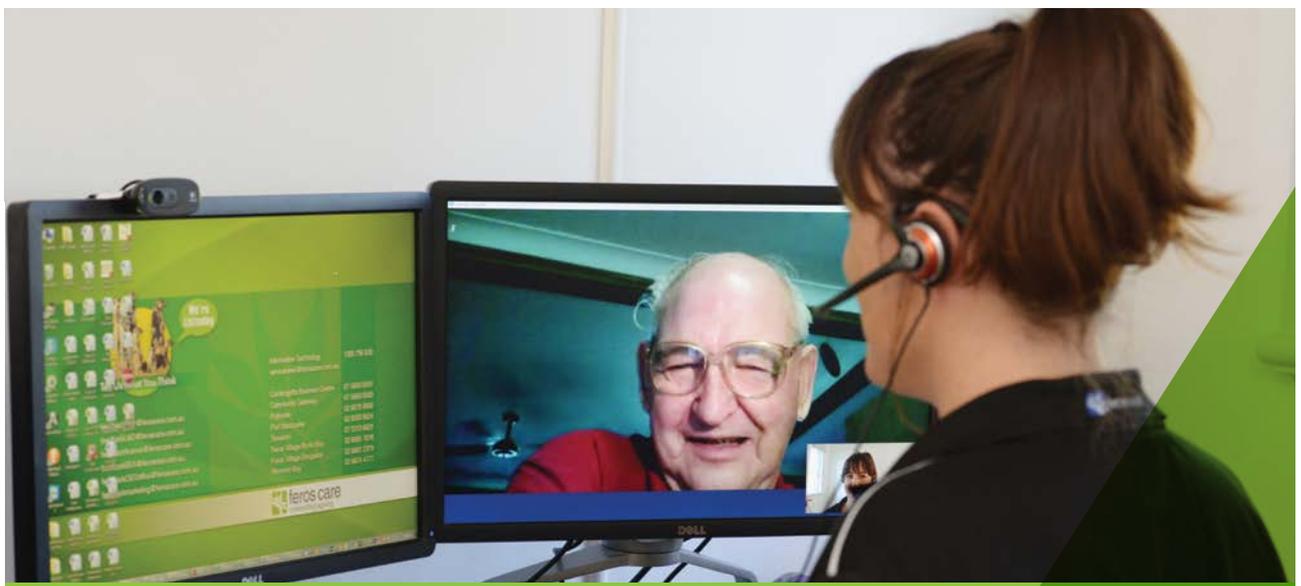
Figure 2: How does Telehealth work?

3.3 VIDEO CONFERENCING

The MHCAH monitor allowed participants to accept and initiate high definition video call using Feros Care's secure video-conferencing (VC) platform. The platform enabled multi-party video conferencing with up to 16 concurrent users being able to join in on the same video call. A range of approaches was introduced during the pilot to increase service user engagement with video-conferencing.

These included:

1. Connection to the THRN using video-conferencing.
2. Virtual consultations with GPs and case managers from three different organisations (Local Health District, Community Options and Feros Care).
3. Introduction of a 'chat club': an informal session, facilitated by a local media personality (Mick O'Regan) and made available to participants via video conference in morning and afternoon sessions. The sessions incorporated different themes and invited guests. For instance, one of the sessions was Margaret Fisher: Fit and fabulous at 83. Margaret Fisher is a tennis champion who has had a career in education and politics. Other sessions explored sporting heroes and comparisons between the past and present.
4. Specialist telehealth sessions: Feros Care invited a range of health professionals, including a pharmacist, physiotherapist and nutritionist to talk to participants about their health and medication use.
5. Telehealth literacy sessions: facilitated by PhD student, Annie Banbury as part of her PhD. The telehealth literacy sessions involved a series of workshops with groups of participants (up to 7 connected at one time) with an emphasis on enhancing health literacy and self-management skills.
6. A Virtual Bingo event which was relayed to three residential villages and to participants in the pilot.
7. Introduction of a telehealth 'help' button onto the participant's MHCAH so that participants could press a single button and connect via video conference to a member of the Feros Care team.
8. Convenient, single button video calls with family and friends using public access video conferencing platforms such as skype.



4. EVALUATION METHODOLOGY

The Evaluation of the pilot was conducted by Southern Cross University and drew on the principles of realistic evaluation [3], using an approach called Inductive Logic Reasoning [4] to address a series of testable propositions using formative and summative strategies and multiple data sources. The approach could not provide definitive answers to comparative questions such as consequent changes in the rates of hospitalisations or emergency department presentation, as these questions ideally required RCT methodology. However, given the tight timeframe for the project and the challenges of recruiting a control group it was acknowledged that it would have been unlikely that these questions could be addressed conclusively within this study. Instead, the methodology examined different sources of primary and secondary data to test empirically several of the assumptions underpinning telehealth interventions.

The Pilot was longitudinal study, observing the vitals and wellbeing of a fixed set of participants, to examine the impact of the virtual health service model on participants' health and wellbeing.

The overall evaluation framework involved testing propositions that were based on the evaluation objectives that were to explore the extent to which the MHCAH:

1. Improved access to health;
2. Impacted on daily monitoring of health conditions;
3. Improved data for GPs and other health professionals to manage and improve medical decisions;
4. Enhanced early intervention;
5. Reduced social isolation;
6. Improved health outcomes;
7. Influenced health system outcomes such as health related transport costs or number of hospitalisations/ hospitalisation rates.

And to explore:

8. The overall effectiveness of the telehealth service(s) provided in the project.
9. The effectiveness of the NBN in enabling telehealth service delivery.

Multiple sources of data were used to address the objectives:

- a. Detailed activity-based audit data, including: participation data; IT service request data; number of home visits; referral statistics; timeframes recorded for new installations; participant specific demographic data; health data; interventions per participant; and GP specific data.
- b. Surveys with participants, specifically: NBN Participant Survey (including the Stanford Chronic Disease Self-Efficacy tool [1] and the Self-Rated Health Questionnaire [2]); NBN Friend and Family Survey; NBN Physician/GP Survey; Participant Experience Questionnaire (developed from interviews with participants).
- c. Interviews with participants representing all stakeholder groups.
- d. Case studies of exemplars of specific aspects of the MHCAH pilot drawing on the data collected above.
- e. Documentary analysis of meetings and reports, such as incident reports.
- f. A 'sociogram' completed by participants at the start and finish of the evaluation to measure the level of social connectedness of the participant.
- g. Literature reviews to underpin each of the propositions.

5. RESULTS

5.1 PARTICIPANTS

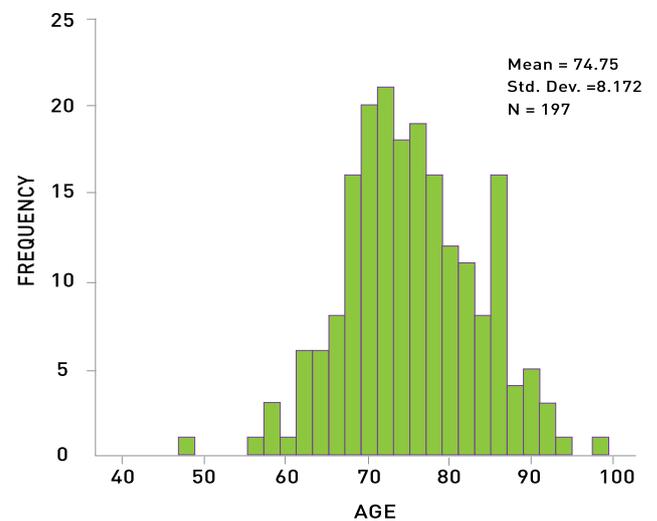
200 participants were enrolled in the MHCAH pilot between 1 April 2013 and 30 June 2014. Of these participants, 181 were included in this longitudinal evaluation (the remainder were excluded as they were not recruited until late in the pilot period). The majority of participants were connected to the NBN and recruited from Coffs Harbour / Sawtell region.

Due to the very tight timeframe for the pilot and the limited geographic coverage of the NBN, pilot participants were recruited directly from the Coffs Harbour seniors community rather than through traditional referral sources such as hospital, health professionals and GPs. Consequently, the majority of referrals to the pilot were from participant self-referral (64%). Other referral sources included Feros Care (12%), GPs (8%), community-based health services (10%), family and friends (5%) and other agencies. Hence, the participants did not necessarily reflect the ideal

target group for the pilot (i.e. participants at high risk of hospitalisation due to their chronic condition).

Participants ranged in age from 49-93 years (see Figure 2). The majority were female (57%), lived with their partner or family (63%), were non-indigenous (88%), and spoke English as a first language (97%).

Figure 3: Age distribution of participating clients



The target population for the pilot was seniors over the age of 65 with one or more chronic conditions and / or were socially isolated due to the illness or disability. The single most commonly reported chronic condition amongst the participant cohort was high blood pressure (56%) followed by heart problems (33%). Participants reported up to 6 different health conditions, with the majority of participants (30%) reporting two health conditions.

Table 1: Age and chronic disease characteristics of participants

AGE	NUMBER	DIABETES	COPD	ASTHMA	HEART PROBLEMS	HIGH BP	LOW BP	CHF	CANCER	PAIN
<60	6	2	4	1	0	1	0	2	1	1
61 - 70	56	12	10	4	18	38	2	2	4	1
71-80	88	30	21	12	29	48	3	9	9	2
81-90	44	12	13	6	11	14	3	4	6	1
>90	5	1	1	0	1	4	0	1	0	0
Total	199	57	49	23	59	105	8	18	20	5

5.2 OUTCOMES OF PARTICIPATING IN MHCAH

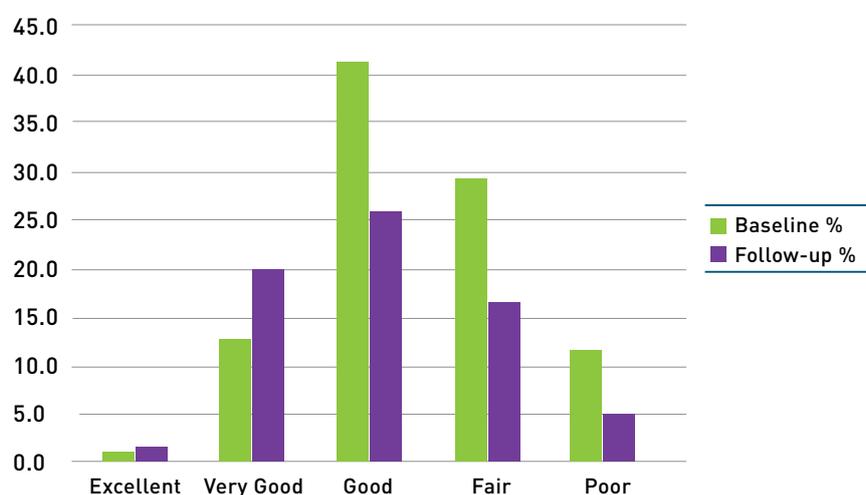
From the Participant Experience Questionnaire, the most common reason participants gave for choosing to participate in MHCAH was to monitor their own health (68%). In particular, seniors participated in the pilot to:

- help them identify problems before they became serious (65%);
- facilitate better self-management of their health (58%);
- have better information about their health (52%).

These goals were largely achieved with almost equal numbers of participants (48%) reporting that they better managed their own health and had better information about their health as a result of participating in the MHCAH pilot.

Overall, pilot participants experienced an improvement in their self-rated general health with more participants reporting their health as “excellent” or “very good” at the end of the pilot compared to the beginning.

Figure 4: Change in general health scores from baseline to follow-up



Participants also experienced an improvement in their levels of self-efficacy for managing their chronic disease, as measured by the Stanford Patient Education Research Centre “Self-Efficacy for Managing Chronic Disease 6-item scale” [7].



These findings were supported by the qualitative feedback. Clients reported that they were better able to understand their vital signs readings, and relate these to their behaviour change, as the following quotes from the THRN demonstrate:

“I think the biggest impact was the increasing confidence of clients to discuss and understand their health conditions. When they first came onto the pilot, they would say to us I take my BP but I don’t know what the numbers mean. Just that general education about what their vital signs mean, and how they relate to their activity, what they eat. There is a varying level of knowledge of health and wellness in diet, and even fluid intake.”

“Well I played bowls all day and it was 36 degrees in Coffs Harbour and I only had 2 glasses of water”, explaining to them the relationship between their activity, their medication and their health. Then getting them to talk to their GP about it. Nine times out of 10 they wouldn’t talk to their GP about it because they hadn’t wanted to bother them about it or didn’t think it was important. Giving them the confidence to have those discussions and make the interactions more meaningful, and be in more control.”

Feedback from one of the clients suggests that she liked to take responsibility for her self-management:

“I have lots of fluctuations with my blood pressure and chronic pain. My blood pressure fluctuates with the pain. I find that looking after myself is really important. I like to take responsibility for my own health. I have to go to the doctor a lot, so I’m grateful for anything that helps me understand my health and keep on an even keel.”

Other benefits of participating in the pilot included the participants' perception that they:

- Had better information to help the doctor with the ongoing management of their health condition (44%);
- Had greater confidence discussing health issues with their doctor (25%);
- Worried less about their health (31%);
- Liked being monitored and knowing that someone was keeping an eye on them (51%);
- Had a better understanding of vital sign monitoring (48%);
- Went out more (15%);
- Changed (increased, decreased or otherwise altered) medication (17%);
- Increased physical activity (33%);
- Made positive dietary changes (better understood the impact of diet on health 34%; ate more fruit and vegetables 28%; drank more water (39%).

Table 2: What did you hope to achieve as part of your involvement in My Health Clinic At Home pilot?

ANSWER OPTIONS	%	RESPONSE COUNT
To identify health problems before they become serious	64.8	83
So I could better manage my own health	57.8	74
To have better information about my own health	52.3	67
So I know that there is always someone keeping an eye on me	50.8	65
To help my doctor with the ongoing management of my health condition	35.2	45
So I would worry less about my health	27.3	35
To only go to my doctor when I really need to instead of having regular check-ups	26.6	34
So my carer would worry about me less	18.8	24
To take the pressure off my carer/family	17.2	22
Other (please specify)	4.7	6
Missing	2.3	3

5.3 HEALTH SERVICE USE

Changes to health service use were based on participant self-report collected from two sources: surveys administered before and after the pilot; and the Participant Experience Questionnaire. Over the duration of the pilot, participants reported:

- Fewer visits to the doctor (24% of participants), which was supported by the comparative data at baseline and discharge
- Fewer visits to the emergency department at the local hospital
- Fewer non-local hospital admissions compared with the preceding year
- No statistically significant reduction in local hospital admissions

Detailed anecdotal data captured by the THRN activity log identified 19 participants who may have avoided hospital admission; 6 participants whose length of hospital stay may have been reduced; and 53 participants who changed their medication as a result of their participation in MHCAH.

5.4 PARTICIPANT USE OF TECHNOLOGY

During the pilot, participants performed a total of 32,540 vital sign readings and participated in 4,888 video conferences sessions.

Table 3: Number of Telehealth services

TYPE OF READING	TOTAL
Vital Sign Readings	32,540
Video conference – THRN	2,767
Video conference – GP / Specialist	6
Video conference – Care Manager	23
Video conference – LHD	29
Video conference – Education / chat club	230
Video conference – Family & Friends	1,833
Total No of video conferences	4,888



There was only a small number of participants who reported any difficulties with the MHCAH technology in the Participant Experience Questionnaire. Nearly two thirds of all participants described themselves as unconfident (35%) or moderately confident (27%) computer users prior to engaging in the pilot. One third (34%) reported that participating in MHCAH increased their confidence using a computer; one-fifth (23%) were more confident using video-conferencing; and 7% started to use a computer for other purposes as a result of participating in the pilot.

Table 4: As a result of participating in My Health Clinic At Home pilot, has your confidence in using a computer changed? (select all statements that apply)?

ANSWER OPTIONS	RESPONSE %	RESPONSE COUNT
I am more confident using a computer	33.6	43
I am less confident using a computer	4.7	6
I am more confident using video-conferencing	22.7	29
I do not like using video-conferencing	12.5	16
I have now started using a computer for other purposes (please specify)	7.0	9
No change	40.6	52
Other (please specify)	10.9	14
Missing	3.9	5

More than half of all participants (52%) expressed a willingness to video conference with their doctor. They were also prepared to video conference with their specialist (37%) and pharmacist (37%), however the opportunities to connect with these practitioners during the pilot was restricted due to limited practitioner engagement.



Table 5: Which of the following services would you use if it could be delivered with video-conferencing on your computer (select all that apply)?

ANSWER OPTIONS	RESPONSE %	RESPONSE COUNT
Doctor	52.3	67
Specialist	36.7	47
Pharmacist	36.7	47
Physiotherapist	17.2	22
Occupational therapist	18.0	23
Podiatrist	18.8	24
Speech pathologist	10.2	13
Other	29.7	38
Missing	44.5	57

Comments from the Local Health District Case Managers on client engagement with VCs:

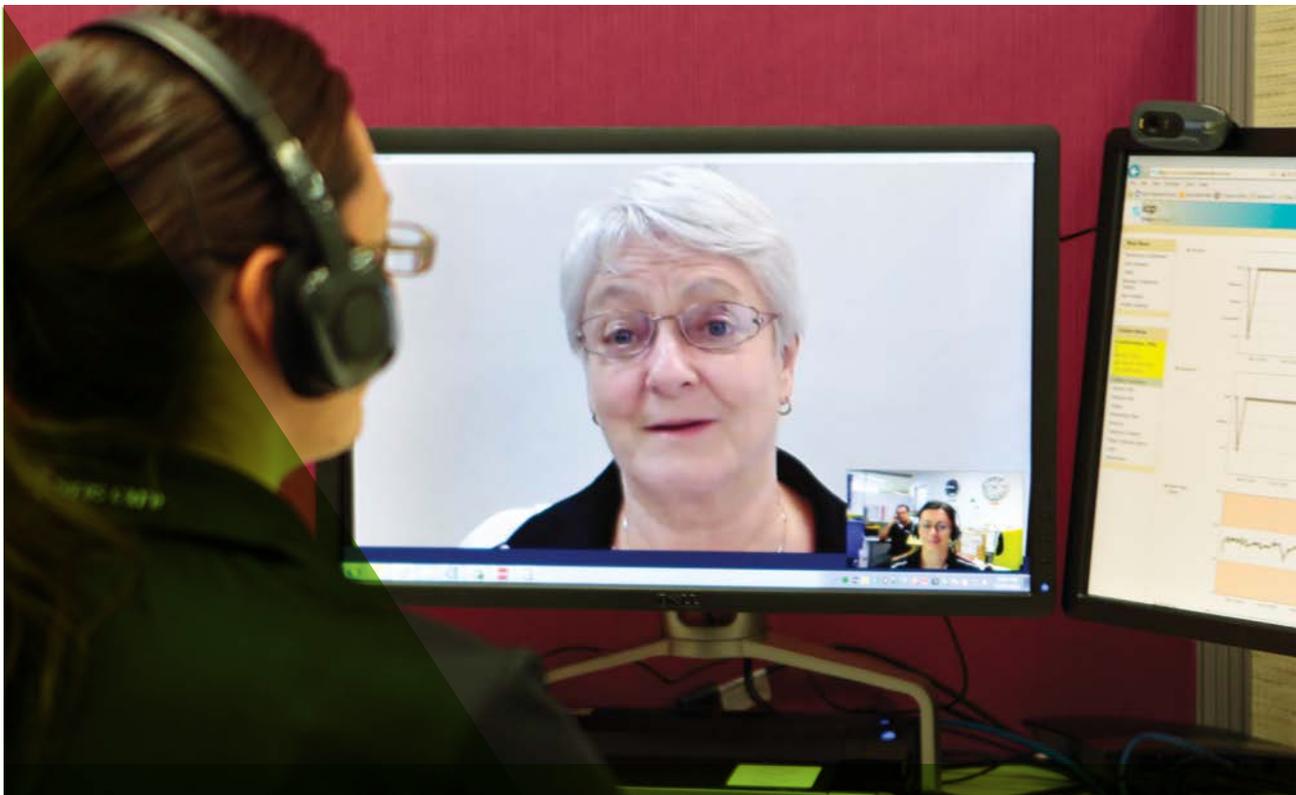
“The clients don’t have an issue with the technology”
“They’ve embraced it”
“They’ve said that they want to do this”
“The client says I wish I could have VC’d the dietician”
“We’ve got 90 year old people doing this who have no issues”
“Most of them find it empowering”
“One of my clients said ‘I don’t need my family to take me to the doctor because I can VC’”



5.5 SERVICE PROVIDER ENGAGEMENT

There was 1 GP and 7 case managers from the Local Health District (LHD) who participated in the study. In addition to the participants, 51 GPs received trend reports pertaining to their patients participating in the MHCAH pilot. Interview and survey data suggested that barriers to service provider participation included lack of interest due to the short timeframe for the pilot, financial barriers, and difficulties fitting the technology into the daily routine of the clinic.

Lack of service provider engagement limited the ability of participants to use MHCAH to its full potential because of a lack of opportunities to use video-conferencing with a range of providers. It also limited the ability of the pilot to specifically target those seniors most at risk of hospitalisation. This in turn reduced the ability of the pilot to fully demonstrate the effect of MHCAH on those participants who would most benefit.



The service providers who did engage with MHCAH could see the potential for the use of telehealth. In particular, they perceived that it could reduce the amount of travel required by the client and/or the service provider. They reported that video-conferencing provided a realistic window into the client's life, allowing practitioners to observe behaviours that may not be displayed during a face-to-face visit and would not be observable by telephone. However, the practitioners acknowledged that different processes and protocols would be required to engage with clients using video-conferencing. In particular, they acknowledged the need to use headphones, and to ensure visual privacy.

Practitioners perceived that good change management and leadership are required to implement the use of telehealth to fully realise the benefits. They also acknowledged that the service users were more at ease with the technology than the service providers.

5.5.1 QUALITATIVE FEEDBACK FROM THE GENERAL PRACTITIONER SURVEY

Practitioners were asked “Please tell us what impressed you about the home monitoring service”. In response, 5 GPs perceived that MHCAH may have some potential benefits:

“Good results and trends useful for certain, carefully selected patients for time limited period.”
“It is in its infancy and will develop. Patients need to be seen more often to review the results face to face for it to be meaningful.”

In particular, 2 respondents perceived that MHCAH could help patients take more ownership of their health problems:

“Helps patients to be more proactive about their health.”
“Patient ownership of health problems - could help with meeting treatment goals and compliance with treatment through better understanding.”

1 GP could see the potential benefits to enhance access to services:

“The rapid access to specialist services that would otherwise require the patient to travel would be expensive for the patient.”

6 GPs responded that the trial was not relevant or useful to them:

“Not clinically relevant.”
“Unfortunately I did not learn anything about my patient that I did not already know or assess.”

1 GP was unhappy that the client was recruited without his consent, even though the client self-referred to the project:

“The sourcing of the patient was done without my consent. I don't think this is appropriate.”



5.5.2 SERVICE PROVIDER FOCUS GROUPS

The 2 service provider focus groups illustrated important insights about the way that MHCAH impacted on their relationship with the client.

IMPACT OF MHCAH ON CLIENT RELATIONSHIP

The GP who participated in the focus group felt that telehealth gave clients alternatives to attending health services:

“It gave patients alternative access to the practice. If they were unable to physically be there, they could arrange a video conference; it gave them an alternative contact.” (GP)

In addition, the use of MHCAH enabled the GP to have a better understanding of health events after they took place by being able to map the vital signs monitoring on the trend reports:

“When patients complain of physical disabilities, you only see them after the event, once they are stabilised and you’ve got no idea what they were talking about. Usually we would say, go to the emergency department if you feel that way. But you don’t have any way to see what they were going through. Here I can see they were feeling unwell, and through the vital sign monitoring, I can see a dip in their BP or oxygen saturation, and know that that is probably the event, and may direct me to some medications or whatever. I can also see that if they were really in trouble, then the immediate response is to get an ambulance out rather than go to the GP.” (GP)

VITAL SIGNS MONITORING

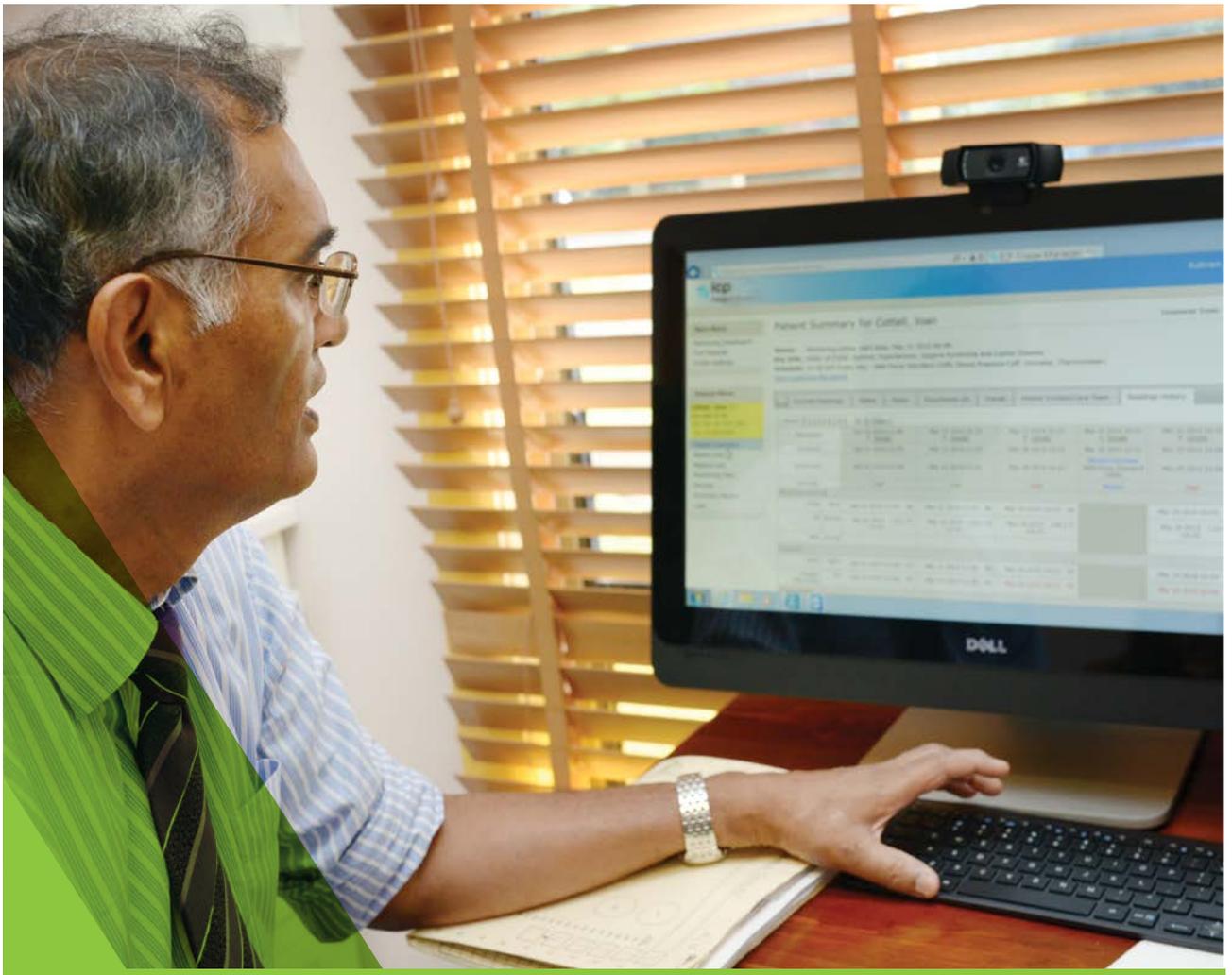
Some of the written and verbal feedback from the GPs suggested that self-monitoring of vital signs made the clients worry more about their health. However the health service providers perceived that having more information gave the clients a moderating effect on their health, reassuring the ‘worried well’, and informing those who may really be unwell:

“Some clients become overly anxious about their health, but they were anxious beforehand. These are the ones who self-monitored all the time and they go for bike rides every day. They are really quite fit. For these clients, it’s giving them reassurance that they’re actually healthy, and they are reassured that they don’t need to worry. For these clients, it makes them less anxious. Then there are the others who didn’t worry about their health, but their symptoms are quite serious, and getting them to see the health professional”. (THRN)

APPROPRIATE USE OF VIDEO-CONFERENCING

The use of video-conferencing in clinical interactions required planning on behalf of the service provider, and ideally, some dedicated time to perform the video-conferencing. Although there was one example provided of a GP who carried his tablet with him and carried out video-conferencing 'on the go':

"It does take some time, you have to go through documents, make time to organise the video conference. It requires some effort. If it becomes the main way of doing it, I don't know how it will impact on the practice. At the moment it can be absorbed. The main impact is the time set aside to do the preparation to get something worthwhile out of it. You've also got some loss of control. You've got to realise you've got other things to do that you can't fit in. Wednesdays work well for me because that's the day I set aside for home visits. If it had to be any time during the week, I don't know how it would work." (GP)



BARRIERS AND FACILITATORS TO INTRODUCING TELEHEALTH SERVICES

The service providers identified 4 priorities to facilitate the uptake of telehealth services:

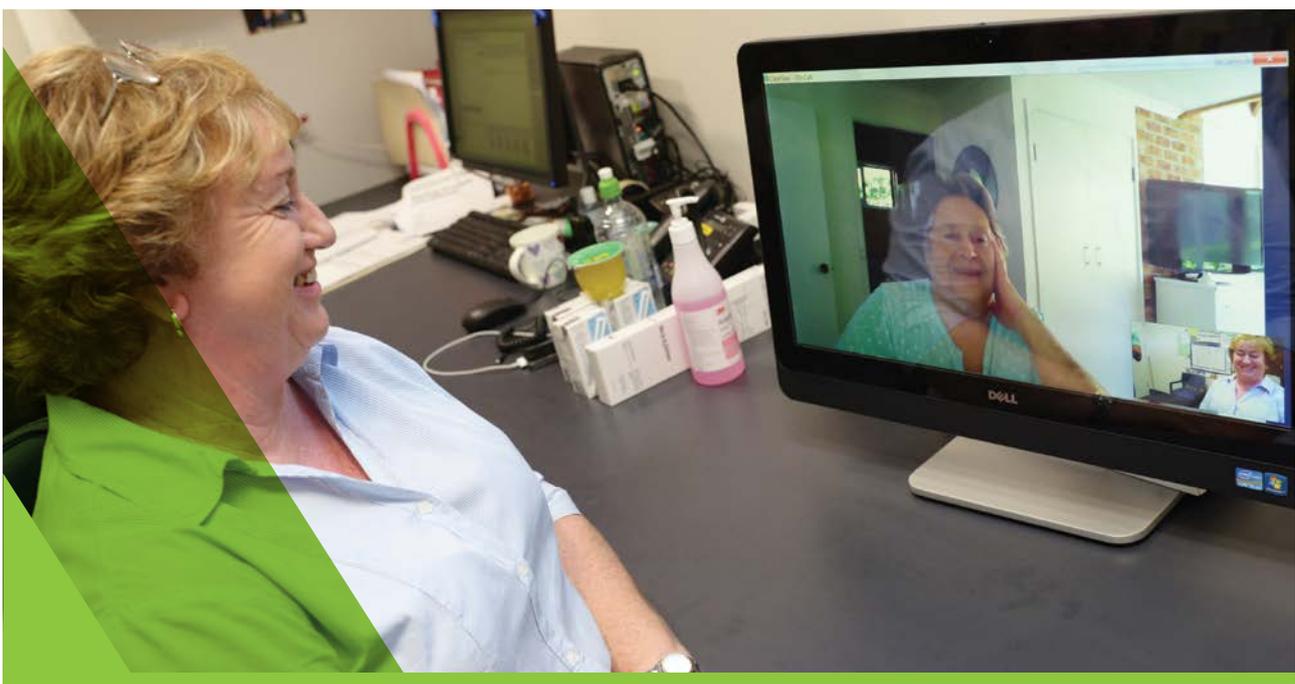
1. Ensuring a stable technology platform (such as NBN)
2. Providing appropriate funding / reimbursement models for practitioners
3. Ensuring the physical environment is appropriate for the introduction of telehealth technologies, and
4. Supporting change management with health practitioners and organisations.

Education of health service providers was also identified as an important mechanism to facilitate the introduction of telehealth.

“Whenever there is something new they don’t know about it, they focus on the negatives. So what comes out of this is to look at the positives – to show that there are positive sides to this, to crystalise it. How it saves time, how it improves health.”
(Local Health District Case Manager)

There was also some perceived scepticism by GPs about yet another short-term innovation that may not be sustained.

“Look at the models we were presented with before, and doctors would get involved and look at the outcome. They will lump anything like this, like Coordinated Care, if you want to talk to them about a group of doctors with good intention. Where is the Division of General Practice? Where is the Medicare Local going? I don’t have time to go through this and find that there is nothing at the end of it, I’d rather do what is tried and proven.”(GP)



5.6 IMPACT ON SOCIAL CONNECTEDNESS

The Pilot implemented a range of strategies to increase participant engagement with video-conferencing and to showcase the benefits and potential of the NBN. Video-conferencing interventions included one-to-one contact with the THRN, GP, LHD or Care Manager; Skype connections to family and friends; a chat club; and structured group health literacy and social sessions (e.g. facilitated chat clubs and virtual bingo). Overall, participant satisfaction with their level of communication improved across all participants, irrespective of whether they used video-conferencing to communicate or not. This may be due to the social support that is

implicit in the ongoing surveillance by the THRN through the vital sign monitoring, and/or the easy, 'one-touch' access to a telehealth nurse at any time. Prior to participating in MHCAH, 70% of respondents reported that they had never used video-conferencing, 15% had used it infrequently (5 or fewer times); 9% said that they were frequent users of video-conferencing.

Participants were asked to nominate other services that they would consider accessing using video-conferencing. Overall 62 people responded to this question. Participants were open to the idea of receiving health talks, chair tai-chi, yoga, virtual museum tours, and bingo.



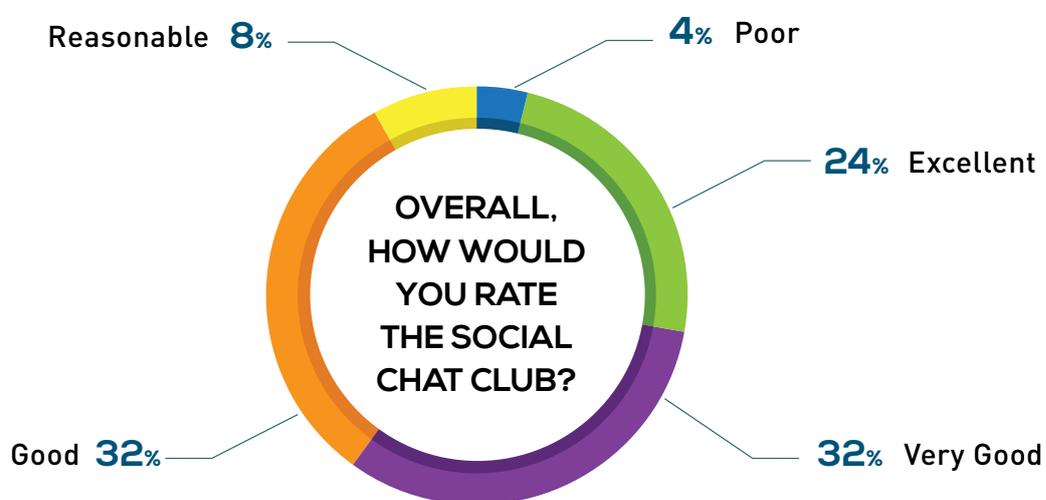
Table 6: Which of the following services would you use if it could be delivered with video-conferencing on your computer (select all that apply)?

ANSWER OPTIONS	RESPONSE %	RESPONSE COUNT
Chair tai chi	17.2	22
Yoga	13.3	17
Bingo	11.7	15
Virtual museum tour	11.7	15
Health talks	35.2	45
Other	25.0	32
Missing	48.4	62

88% of participants who were involved in the social chat club rated it as good, very good, or excellent. Participants provided written feedback on the chat club. They valued the different, interesting topics, speaking with other people and sharing different opinions, being able to see the other participants, understanding how the equipment works, and being able to talk to the nurses.

“I think it’s one of the government’s best inventions. It keeps people like me in touch. When we have our little meetings – God, that was good. I loved listening to them.” (participant).

Figure 5: Overall, how would you rate the social chat club?



5.7 PRICING AND SUSTAINABILITY

48% of participants said they were happy to finish using MHCAH at the completion of the pilot because their health was stable. 34% said they would like to continue to use the technology indefinitely, and a smaller proportion (9%) would like to continue using the technology for a short period of time to address a specific health need. The package of delivery preferred by participants incorporated: support from a THRN during business hours; technical support during business hours; daily vital sign monitoring; and video-conferencing (either facilitated or to access a range of services). However, the majority of participants (57%) said they would not have the service if they had to pay for it. Only one third (31%) of participants were prepared to pay up to \$10 per week, and 10% would pay up to \$20 per week.

At the time of preparing this report, the true cost of delivery of MHCAH, including overheads, was \$111.76 per week or \$15.97 per day per participant (\$85.97 per week or \$12.28 per day, excluding overheads) which may be seen as a barrier to broader deployment.

However, this cost may be justifiable for early discharge or hospital avoidance programs for patients at high risk of hospitalisation. The weekly cost of providing video-conferencing services only is \$54.41 including overheads (\$41.85 excluding overheads).

The pilot identified potential to increase service efficiency through the use of telehealth. The efficiency of the THRN increased as the number of participants recruited to MHCAH increased. The first 7 participants required an average of 20 minutes of THRN time per participant, per day. However, when the service capacity reached 100 participants, the THRN provided, on average, 1.6 minutes per participant per day for all triage, assessment and treatment requirements. After this, the amount of THRN input remained approximately constant as the number of participants increased. With the potential of a Telehealth Nurse potentially triaging up to 255 clients per day each.

Table 7: Telehealth Nurse Clinical Triage Capacity

Average minutes per client from Oct 2013 (when service capacity reached 100 clients) to May 2014	1.65
Nurse minutes in a day (7 hours)	420
Capacity Clients	255

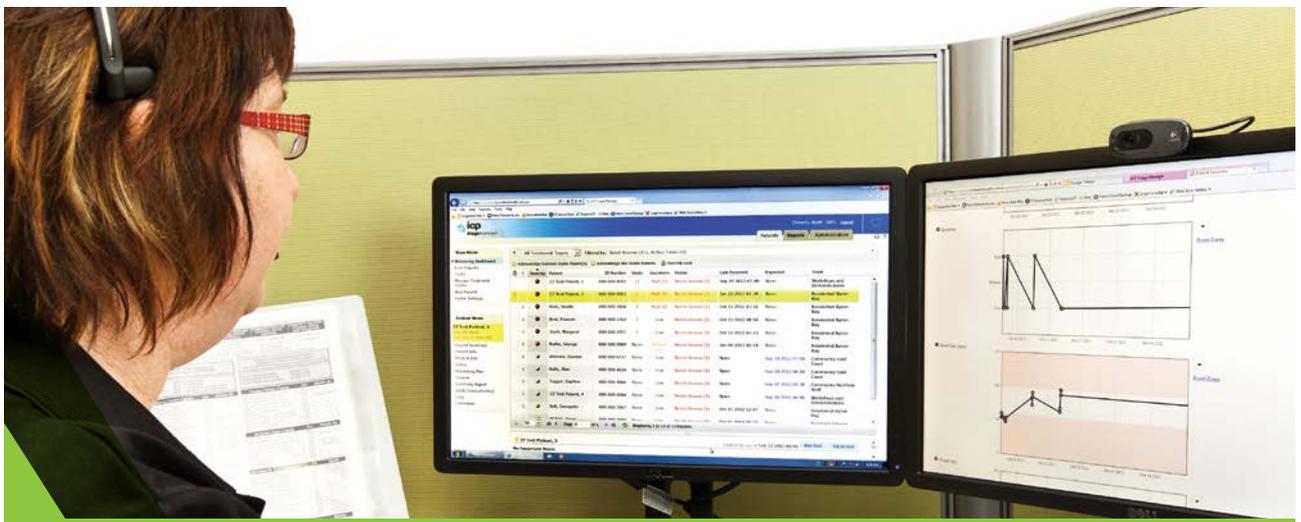
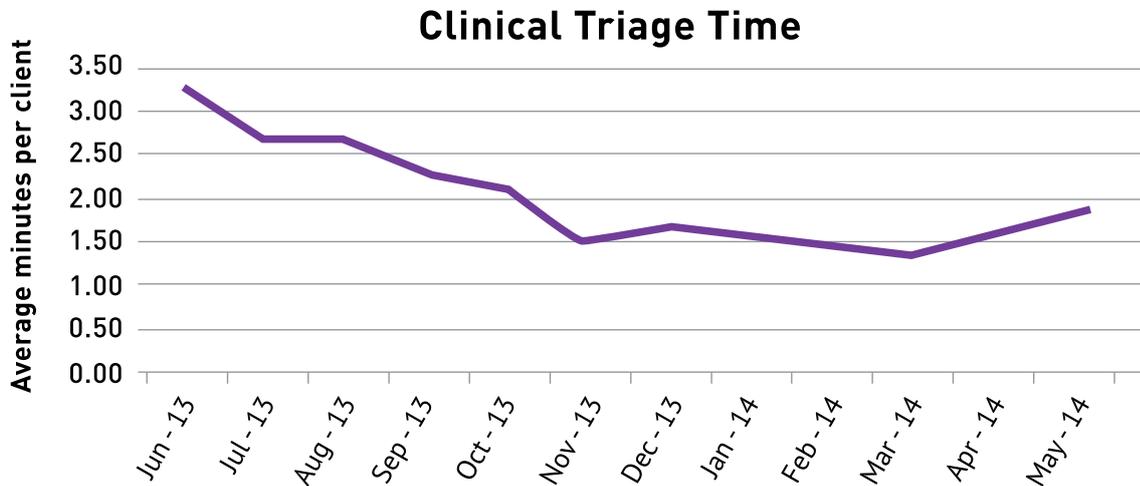


Figure 6: Change in Clinical Triage Capacity over time



In contrast, current Feros Care community case managers who undertake home visits are only able to see an average of 4 clients per day, and spend approximately 25% of their time travelling. A model of case management that combines telehealth with home visits has the potential to improve efficiency by increasing the number of clients who can be case managed by each provider.

5.8 SERVICE INTEGRATION POST PILOT

Feros Care has commenced integration of the MHCAH telehealth into further service delivery as follows:

- 20 participants from the pilot will continue to use the MHCAH for telehealth monitoring via the Home & Community Care program under nursing care.
- 5 participants from the pilot have been referred to the Aged Care Assessment team for a Home Care Package Assessment, with the intention of including the MHCAH telehealth monitoring under their consumer directed care package.
- Commenced the trial and evaluation of the MHCAH tablet as standard issue to Home Care Package clients as a Case Management Tool, in Tasmania (July 2014). The goal is to evaluate the efficiency and effectiveness of the MHCAH to support efficient case management, improved social connectedness and health literacy education.
- Commenced a new MHCAH service in Southern Sydney with 200 seniors with chronic disease under the Home and Community Care Nursing Services program.
- Commenced a Better Health Care Connections Pilot focussing on multi-disciplinary care models in residential care utilising Telehealth services with the goal of engaging in virtual consultations by GPs, specialist, hospital discharge and A&E Departments.

5.9 NBN PERFORMANCE

Throughout the pilot we were able to compare the performance of NBN, 4G and ADSL2 accessibility and internet connection speeds on the implementation of MHCAH. Of the 200 participants, 148 were connected via “fibre to the door”, the remainder were 4G connections. The rollout of the NBN connection to homes was slow, particularly for multi-dwelling units, delaying recruitment in many cases. However, once the NBN was available in an area, it was easily connected. There were no failed video conferences due to connectivity and data transfer was consistent, high quality and reliable across all premises. Typical average download speed was 20 to 25 Mbps, typical average upload 4 to 5 Mbps using a 25 Mbps/5 Mbps plan.

4G internet connectivity was not as reliable as NBN. The signal strength was inconsistent, resulting in unexplainable dropouts during video conferences, although reconnection was possible. Speeds dropped at certain times of the day in some areas. 4G coverage and accessibility was available throughout the majority of the project area. Speed testing showed greater variability depending on the area. Typical download speed ranged between 2 to 19 Mbps and upload speeds were between 1 to 4 Mbps.

ADSL2 connections had additional connection and installation costs and up to a six week wait for installation. Service providers required a minimum connection period for ADSL2 connections which made this option prohibitive for the pilot period. 4G and NBN were more cost effective than ADSL2 due to the way the services were packaged.

“4G is good, but not reliable enough. You would not want to be setting up a consultation with a GP and client because it just drops out.” (Feros Technician)



6. CONCLUSIONS

This was a longitudinal study, without a control group so our ability to draw causal links was limited. However, the findings showed that MHCAH was easy for participants to use, with low incident rates. Despite the older age of the participants, and their varying levels of technological experience and literacy, there were very few barriers to the uptake of the technology. MHCAH gave participants a sense of security and better information to manage their own health and facilitated communication with their health practitioners. Consequently, participants were more empowered and had a better understanding of their health conditions. However, the opportunities to exploit the benefits of MHCAH were not fully realised because of the lack of services to which participants could be referred. There is potential for models like MHCAH to drive participant-centred models of care and self-management which enable them to broker direct contact with other service providers. However, for this to happen there is a need for new models of engagement with health practitioners.

The data suggest that the use of MHCAH reduced the frequency of visits to GPs, hospitals and emergency departments, and while this is difficult to quantify accurately, the high quality clinical notes and anecdotal feedback highlighted several areas in which early interventions may have averted a more serious consequence later on. The findings suggest that the reasons for these effects were multifaceted, but can be brought back to 2 key mechanisms. Firstly, participant self-monitoring of their vital signs led to better understanding of their health conditions, resulting in positive behaviour changes which improved their health outcomes. The second mechanism was the external monitoring (surveillance) of participants by the THRN which resulted in early intervention when a potential health problem was identified. This was likely to have reduced more serious consequences resulting from a delayed intervention. There was also a likely interaction between the self-monitoring and external surveillance, resulting in reinforcement of participant self-monitoring behaviour, and a perception of social support for the participants. Further research is required to test these assumptions.



The current pricing of MHCAH is a barrier for broader deployment to the community care and private market. The recurrent costs of telehealth seem high; however these need to be examined in the context of the potential to keep seniors independent in their own home, reduce hospital admissions, and increase workforce efficiencies. Further modelling is required to determine the appropriate mixture of face-to-face and telehealth interventions for particular participant needs to achieve optimum outputs for the participant and the service. There is an optimal level of service capacity above which new efficiencies cannot be achieved. However once the service has achieved the optimal level of efficiency, there is enormous capacity for service delivery and triage.

“Until the Commonwealth recognises that GPs are the absolute key people in this, and pays them accordingly, it is not going to take off. This will be a huge barrier. I would like to see this group make this recommendation. Until GPs are paid to do this, it won’t work.” (GP)

The true benefits of telehealth will not be achieved without the engagement of GPs and/or other health service personnel. This is going to require a move from short term pilot models to a whole-of-industry transformation to integrate technology-based service models with policy, financial incentives and infrastructure to support telehealth service provision.



7. RECOMMENDATIONS

RECOMMENDATION 1:

That telehealth services become embedded as a mainstream component of service delivery to community dwelling older people. This would involve changes to current Health Care and Aged Care funding models, guidelines and service models to ensure telehealth and emerging technologies are considered a standard service option available to participants and patients in all community care programs (e.g. for all Home Support, Care Packages, Hospital in the Home, Chronic Disease Management, Early Discharge, Palliative Care, Transitional Care and ComPacks programs). This would enable telehealth to be more widely available to many senior Australians and those requiring care and support, and to reorientate service providers to ensure that technology is seen as an approved intervention and a fundamental approach to care delivery, not an “add on”.

RECOMMENDATION 2:

That the NBN “fibre to the door” is made widely available to the home. This study demonstrated that for telehealth to be effective, it needs to be delivered using a stable, high-speed internet platform to the home. With almost 5000 video calls delivered during the pilot, the NBN was the only uniformly reliable platform for the delivery of telehealth across this pilot. New innovations and the constantly increasing demand on capacity are likely to put further pressure on the ways that people connect to the internet. Fibre to the door will “future proof” the ability to provide high speed broadband that will keep up with the advancement in technology.

RECOMMENDATION 3:

The introduction of new Medicare Benefit Schedule (MBS) items for secure video-conferencing for client-to-GP, client-to-allied health and group video-conferencing to facilitate integrated telehealth service models. This will enable service providers to deliver responsive and timely health care “virtual” consultations to clients in their own

home. It will also provide access to GPs and allied health support for housebound and palliating clients in the community. A sustainable funding model will be the key driver for GPs to seriously consider the adoption of Telehealth.

RECOMMENDATION 4:

The provision of funding support for clients to access telehealth services. This, and other studies, indicate that telehealth has the potential to reduce GP and hospital use. However, there are ongoing costs associated with delivering and supporting telehealth, and clients have demonstrated a low willingness or ability to pay for the services. The potential cost saving for health services means that it is likely to be cost effective to subsidise telehealth services for the client, however further research will be required to establish this.

RECOMMENDATION 5:

Widespread change management strategies developed to support the uptake of telehealth by GPs and other service providers. This is likely to include changes to professional training and organisational support to implement the culture change required to introduce telehealth services to service providers. The participants demonstrated high willingness and adaptability to the NBN enabled technologies, suggesting that uptake of telehealth interventions will not be limited by service user capability.

RECOMMENDATION 6:

The introduction of a national policy agenda to drive a more co-ordinated and strategic approach to the research, funding and deployment of telehealth and emerging smart and digital technologies in health and aged care delivery. In particular, these should support new service delivery models; using technologies in the areas of security and safety (telecare smart homes, communication, social support); diagnosis and treatment (telehealth, nanomedicine) and assistive technologies (mobility systems, biorobotics etc). This includes key policy statements on enabling technologies in National Reform agendas.

RECOMMENDATION 7:

The establishment of “Demonstrator Services/Sites” which are funded to build awareness and capability of the use of telehealth and emerging technologies in health and aged care delivery models. These service demonstrators would build the knowledge, awareness, capacity and capability of aged care and health providers on the application and benefits of telehealth, smart and digital technologies.

RECOMMENDATION 8:

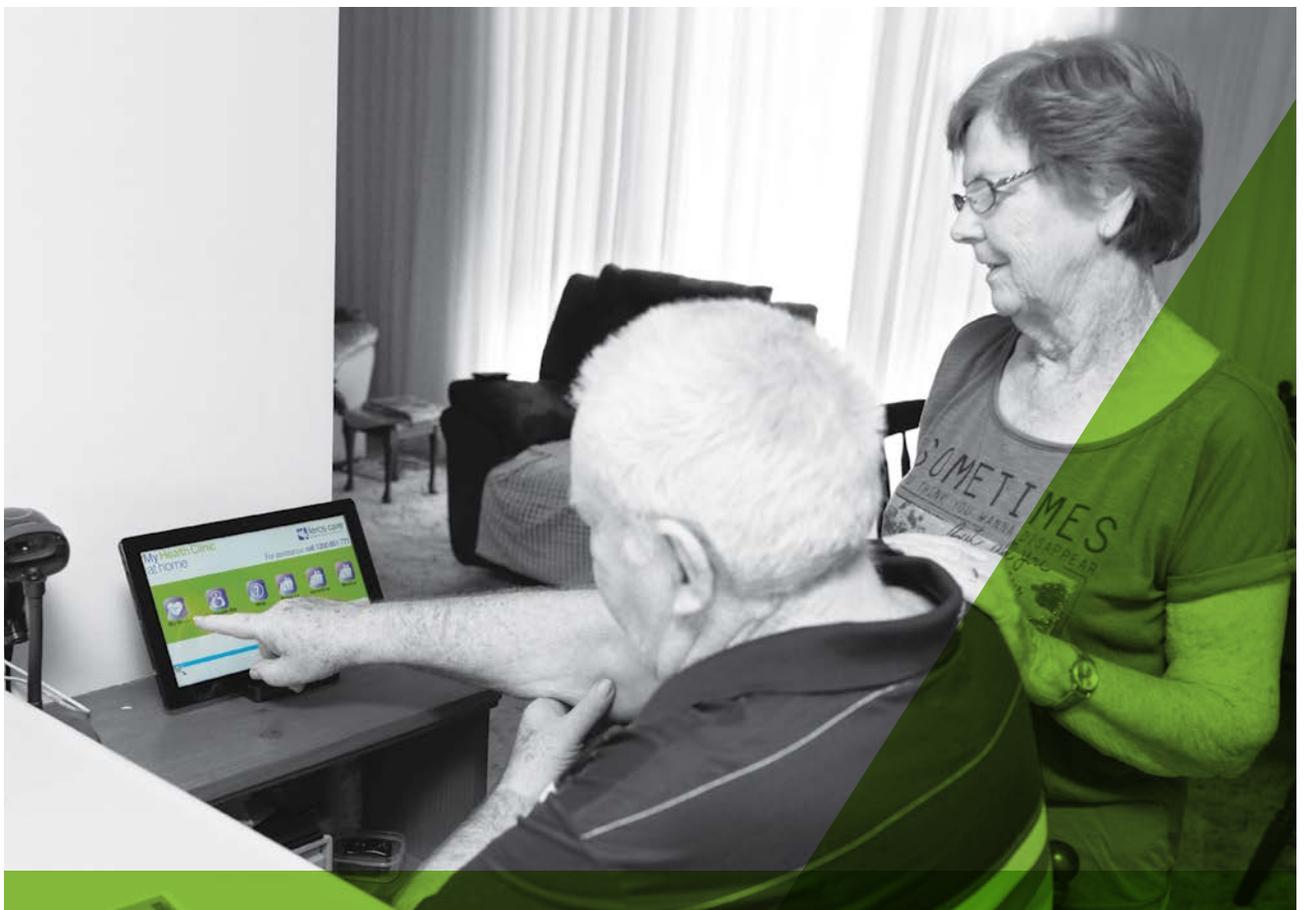
Research into the cost-benefit of telehealth provision for different stakeholders. Service users, providers and health care funders all stand to benefit from the introduction of telehealth. However, under existing funding models, the costs of telehealth are likely to be borne largely by the service user. A greater understanding of the cost-benefit of different models of telehealth to different stakeholders will support the more equitable allocation of resources to support the implementation of telehealth for those most likely to benefit from its introduction.

8. FURTHER INFORMATION

The full report can be downloaded from the Feros Care website at:

www.feroscare.com.au/services/lifelink-telehealthcare/telehealthcare-reports.

A limited number of hard copies care also available on request. Contact Feros Care on 07 5669 0555 or email info@feroscare.com.au



9. CASE STUDIES

CASE STUDY 1 - CLIENT USE OF VIDEO CONFERENCE WITH TELEHEALTH REGISTERED NURSE

Client was referred to the MHCAH pilot in May 2013 by his GP due to recurrent chest infections and difficulty in accessing the GP when ill. As a result, there was a history of the GP providing home visits to client. Client was an 83 year old man who was also the full time carer for his wife. Client suffered from Chronic Airways Limitation, diabetes (NIDDM) with chronic pain due to arthritis and a previous Trochanteric Bursa on his right hip.

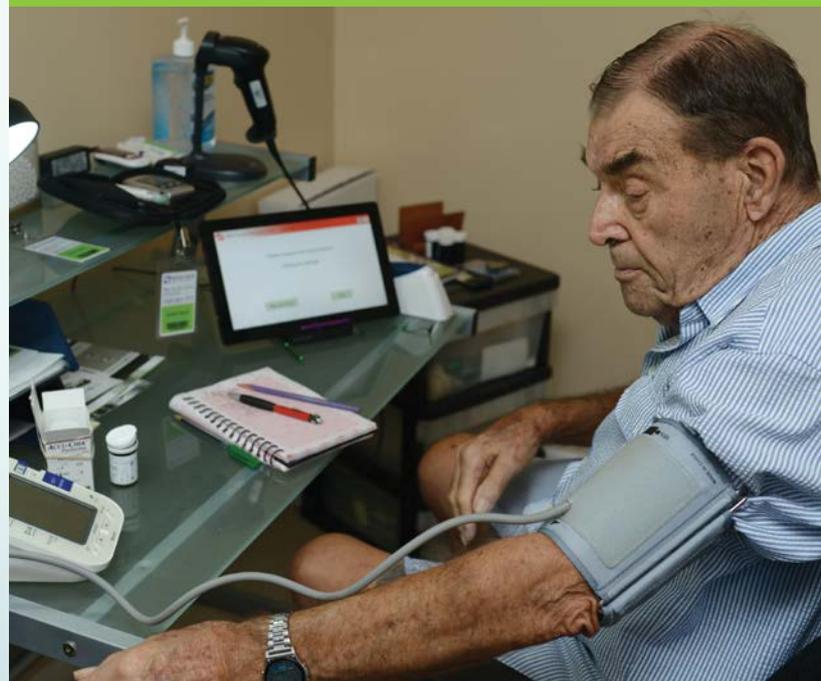
The client was assessed by the THRN in June 2013 and commenced monitoring once the NBN was connected in September 2013. Client commenced monitoring on the MHCAH standard CHF/ COPD/ diabetes combination, monitoring vital signs including oxygen saturation (SPO2), blood pressure (BP), weight and glucose levels (BGL and weight).

Initially the THRN provided support and education via video conferences in regards to existing pain relief, suggestions for alternate methods including patches and management of drug side effects such as constipation. The THRN also discussed the association between elevated BP readings that coincided with his moderate to severe pain. This was evident in positive responses to the wellness question 'other illness' when pain was moderate or severe. The THRN encouraged the client to discuss all these matters with his GP to arrive at a balance between pain relief and side effects he could manage. The client did so and advised THRN that they were able to achieve this balance. The THRN continued to have discussions via video conference with the client when his lung function deteriorated, as a result of bushfires in October. The THRN monitored daily vital signs as client was implementing his management plan

including a short course of oral antibiotics and oral prednisolone. This also included encouraging him to see his GP when the management plan was not being effective. The THRN kept the GP informed using regular trend reports during the course of the pilot which were sent to the client's GP each month.

Since beginning the project, the client has been actively utilising video-conferencing to discuss his health with the THRN and has become very comfortable with the technology. As a result, the client agreed to participate in a video consultation with his doctor and gave the following feedback:

"I was impressed with the consultation; it saved a visit to the surgery. It has saved me time and petrol, plus a 2hr waiting time."



CASE STUDY 2 – CLIENT VIDEO CONFERENCE WITH GENERAL PRACTITIONER

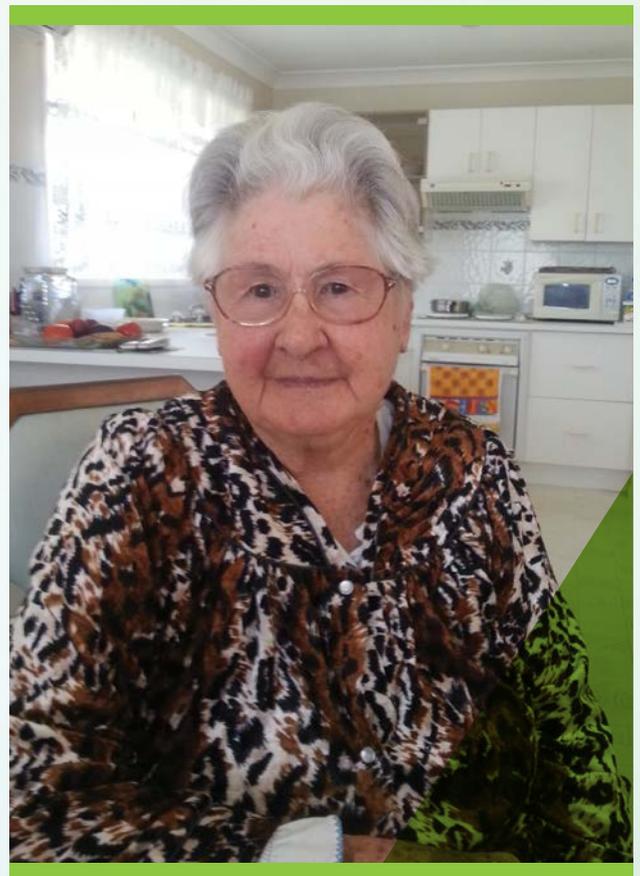
Client was referred to the MHCAH pilot by her GP in May 2013. The client was a 91 year old widow who lived alone and had no living family although she had a strong group of local friends who provided support. She had a history of pulmonary hypertension, aortic valve disease with mitral stenosis and insertion of coronary artery stents in 2006 and 2009. Client's friends also provided transport to attend appointments and social activities as she was unable to drive.

Following some initial reluctance by the Client, at the end of July, the Care Manager completed assessments with the client and discussed the pilot, benefits of video conferences and other packaged care services available to assist with managing her health conditions at home without relying on support from friends.

Installation went ahead as planned although Client was reluctant to begin using the equipment, stating she was unwell and did not wish to commence the interviews until she was feeling better. Client's GP attended her residence for a home visit on two separate occasions to check up on her as she was unable to leave the house. The Telehealth Support Officer (THSO) contacted Client on 4 September and offered assistance using remote access to take her through her interview. Client advised that she had been taking her Blood Pressure and using oximeter over weekend but was hesitant to use the tablet. THSO provided the same support the next day, and from then onwards, the client was able to complete interviews successfully on her own.

At the same time the THSO, following client's disclosure that she had been receiving home visits, discussed a video conference option with client. The client's GP was very supportive of this option and as a result a trial video conference was conducted between the GP and Client on 5th September. Feedback from both the

GP and Client was that they found the experience to be "positive" and "beneficial". Client was enthusiastic about attending her interviews on a daily basis and was grateful that THRN's were there to monitor and make contact when she was unwell. Client has also expressed that she was reassured to know that if she becomes unwell another videoconference could be arranged with GP, eliminating the need for friends to drive her or for her GP to make home visits.



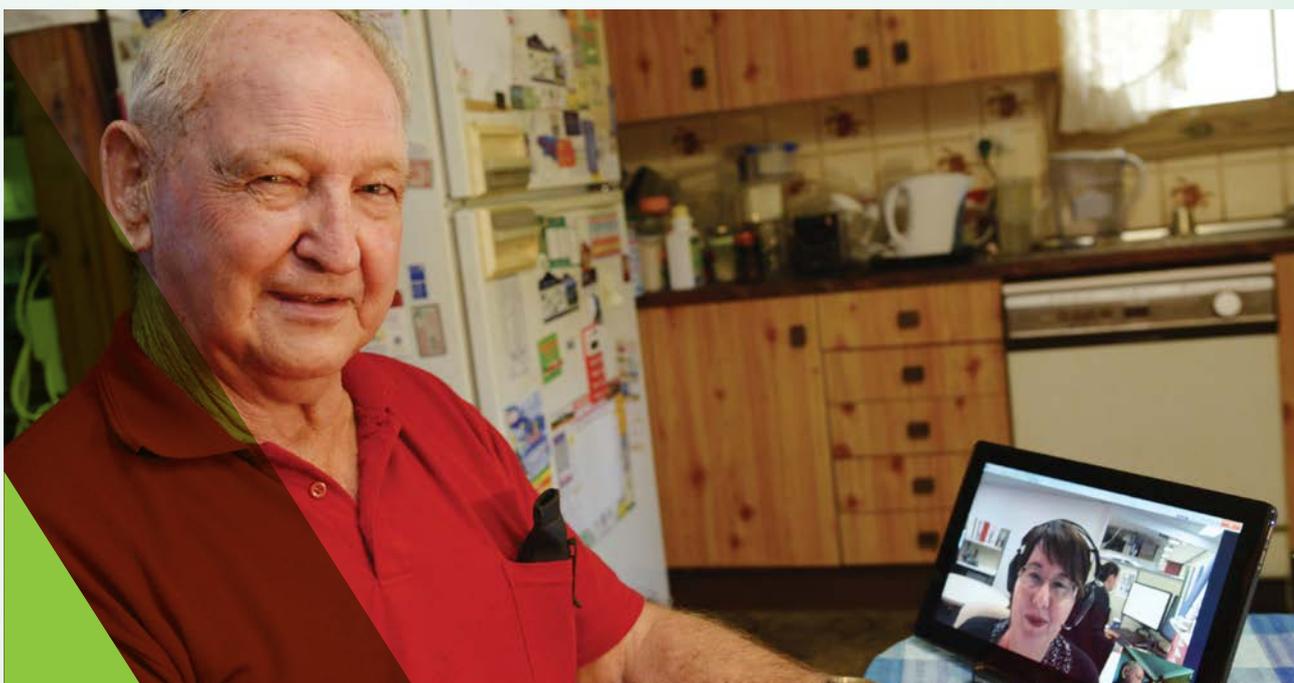
CASE STUDY 3 - CLIENT MEDICATION CHANGE AS A RESULT OF MHCAH

Client was referred to the project by his case manager in the Connecting Care Team at Mid North Coast Local Health District. At the time of his referral the client, a 78 year old male, was living alone following the death of his wife and had a history of genetic heart disease, asthma, anxiety/depression and used PRN oxygen therapy. Shortly after his referral, the client's daughter moved in with him and he commenced monitoring at the end of June.

During an appointment with his GP on 8th August, the client discussed the monthly trend report results that were sent by the THRN on 22nd July. It showed an average Blood Pressure (BP) 148/87, pulse 84 and SP02 97%. After reviewing these results the GP discussed the need for lowering his BP and reducing his total regular daily medication. This involved ceasing his regular Tritace (ACE Inhibitor), Cardizem (vasodilator) and Lipitor (statin) and commencing Candesartan HTCZ (angiotensin II blocker and

diuretic). The GP warned that his lower leg oedema would increase in the early stages until the new medication took effect. During a discussion with the THRN on 23 August the client confirmed the oedema was reducing in his lower legs and he had been using less oxygen therapy.

Since beginning the project the client had been actively utilising video-conferencing to discuss his health with the THRN and had become very comfortable with the technology. As a result the client agreed to participate in a video education session which was facilitated by a pharmacist from the Gold Coast outlining safe medication use and finished with a general question and answer session. While the client was already well educated in most of the content of the session, he felt the video conference was a good platform for learning new information and asked to participate in the next session on mobility and falls prevention.



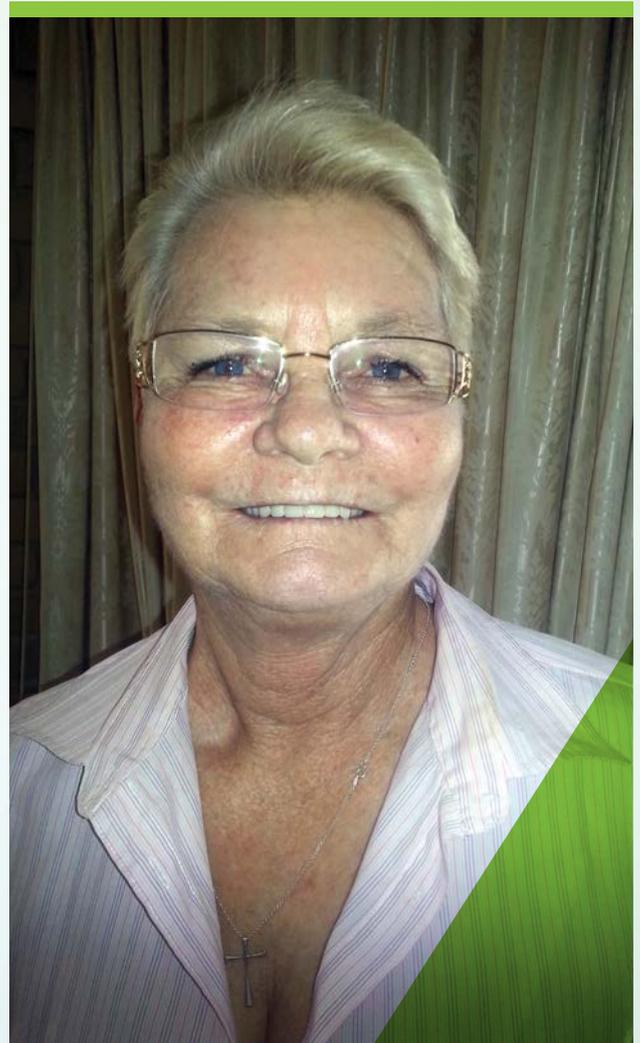
CASE STUDY 4 – CLIENT BEHAVIOUR CHANGE AS A RESULT OF DAILY MONITORING

A 60 year old female client commenced monitoring with the MHCAH on the 31st May. Client, who lived with her husband, self-referred to the pilot after attending a display at the Coffs Harbour Ex-servicemens' Club. She had a history of Chronic Obstructive Pulmonary Disease (COPD) with lupus erythematosus and had an episode of pneumonia in April 2013 resulting in a collapsed lung. During her initial contact and assessment, Client advised the THRN that she had been trying to give up smoking, unsuccessfully, for the last three years. She took her daily vitals which were monitored by the THRN including; blood pressure, oxygen saturation, temperature and weight.

Client worked part time in the morning at a local nursing home and completed her MHCAH interview after returning home from work. Early in her MHCAH participation, Client expressed to the THRN that she was surprised by how low her oxygen saturations readings were. She commented that as a result she has found more determination to give up smoking regardless of the side effects she has previously experienced by medication such as Champix. These side effects were discussed with Client and she was encouraged to disclose these to her GP.

After a visit to the GP, Client contacted the THRN and conveyed that her doctor was interested in her daily oxygen saturation results. Previous O2 readings taken at doctor's surgery were always 98% whereas she advised him during the check-up that her daily readings had been between 90-94%. Consequently the THRN compiled a trend report of a full month's daily oxygen saturation results and faxed this to Dr X prior to the client's follow-up appointment. The following day, Client contacted the THRN via video conference and

relayed that the doctor had said 'I wouldn't have believed it if I hadn't seen the results'. As a result, Dr X has prescribed a course of oral antibiotics for a chest infection to reduce the risk of developing pneumonia again. Dr X also told her that he was very happy with her daily blood pressure readings and her participation in the project. At the end of her course of oral antibiotics, Client's daily oxygen saturation readings returned to 98%.



CASE STUDY 5 – GROUP VIDEO CONFERENCE SESSIONS: TELEHEALTH LITERACY PROJECT

The Telehealth Literacy Project (THLP) was a five week group education program focused on developing health literacy and self-management skills.

The THLP was a mixed methods nested study within the MHCAH study and will form part of a PhD Thesis by Annie Banbury, who developed and delivered the program. More detailed evaluation will be published in journal articles.

Evaluation of the THLP was pre and post intervention using the Health Literacy Questionnaire [5], Health Education Impact Questionnaire [6], a concentric circles social network analysis and a questionnaire developed to assess the acceptability of using video-conferencing with seniors living at home. 3 focus groups and 16 additional interviews were undertaken.

MHCAH clients were invited to take part in the THLP from February 2014 to May 2014. Using the Health Literacy Questionnaire, clients were grouped together with people of similar health literacy levels. Clients were connected to a virtual room, where they could see and hear all group members and the course leader. Each week different aspects of health literacy and chronic disease management were discussed. Topics included:

Week 1: Active Self-Managing

Week 2: Self-Monitoring and Insight

Week 3: Communicating with Health Professionals

Week 4: Finding, Understanding and Using Health Information

Week 5: Being Medicine Wise & Advance Care Planning

The sessions were designed to be highly interactive, with the course leader sharing slides and videos. Clients were encouraged to contribute

to discussions by sharing knowledge and their experience of living with chronic conditions. A technical support person remotely connected clients to the virtual room and during the session was in the same room as the course leaders to troubleshoot any technical difficulties. Post intervention data will be collected three months after the completion of the program to provide an indication of the long term effects.

INITIAL EVALUATION

52 participants (37%), forming nine groups, opted-in to take part in THLP. Groups consisted of between 3 and 7 clients and were allocated regular times each week to meet. They valued the different, interesting topics, speaking with other people and sharing their experiences and differing opinions, being able to see the other participants, understanding how the equipment works, and being able to talk to the course leader and nurses. The health literacy programs were valued for their breadth of content and interaction.

“These sessions, are good because you hear other people’s opinions and thoughts. It makes you stop and think”

Clients valued being able to meet in a group from home, rather than travelling to a venue. For those who lived alone, being part of a video conference group provided social contact. The group education added value to MHCAH by demonstrating that clients are willing and able to participate in group health education sessions designed to improve health literacy.

“But when you see people getting on with their life and coping with a chronic condition, that sort of thing makes you realise you’re not in isolation”.

CASE STUDY 6 - CLIENT WHO ATTENDED THE CHAT CLUB

The client was a 74 year old female who lived alone. She suffered from high blood pressure and had Type 2 diabetes. Prior to joining the MHCAH telehealth pilot, she had never used a computer but was very keen to learn. She participated in the chat club in which clients were connected in a group video conference and given the opportunity to participate in a group conversation with 83-year-old tennis champion Margaret Fisher. Client made the comments below:

What was it like taking part in the chat club?

“It was really nice, Margaret is lovely - I remember her from when I was younger. I am so proud of people like her who “just do it”; she is a wonderful person who just enjoys life. It was great learning all the little things about people. I find it interesting and I love talking so I just love it!”

Was the process simple?

“To me it really is, I am dyslexic with some things but I do understand people. I used to find it hard to understand things like this and my husband actually taught me to read. I found this easy to understand and I enjoy this way of talking.”

How does something like this benefit you personally?

“I am lucky because I do a lot of walking and I usually enjoy it but it is very inspiring when you see people like Margaret. It is great to find out that people are doing things like this, I think back and it used to be that after 60, life was pretty much over but now it feels like we are all still learning and trying new things.”

Is it something that you would like to take part in again?

“I like this sort of thing; it broadens your mind and it's great to meet people on your level. Some people are more active and others are less but it's nice because you learn the opinions of others. I think that the best thing is to keep active and alive and this is what the chat club does because we get to talk to other people and be inspired.”



CASE STUDY 7 - ONLINE BINGO

Feros Care hosted Australia's first virtual bingo game for seniors from its head office in Coolangatta. The bingo game was live, linking 23 residents from three Feros Care residential villages in Northern NSW and three MHCAH clients living in Coffs Harbour.

Feros Village Bangalow was connected to the game using a portable video conferencing unit that can be used anywhere in the village to enable video calls for residents. Feros Village Byron Bay participated from the facility's dedicated video conferences room and Feros Village Wommin Bay residents joined from the facility's activities room using a dedicated video conferencing unit. Coffs Harbour clients at home were connected via the NBN using the MHCAH.

The bingo session ran seamlessly with no technical issues encountered. All participants were sent game cards and marker pens to mark off their numbers prior to the event. Volunteers and Feros Care staff

were on hand at the three Feros Care Villages to assist when required and to hand out prizes.

Feros Care client, Lorraine Capararo, of Coffs Harbour said she had so much fun catching up with old friends through the virtual game, it didn't matter that she didn't win. "It's not about winning,; it's just so much fun. I liked seeing fellow clients Ed and Tina again as they are the nicest people. You don't realise that you can build friendships over this type of thing."

Ed, also from Coffs Harbour, joked that he didn't think he was old enough for bingo. "But I really loved it. The sound and the picture were very clear and everyone seemed to be having a really good time."

John, a Feros Village Byron Bay resident, wanted to know when he could play again and Bangalow residents said they would play virtual bingo every day if they could.



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FEROS CARE'S
MY HEALTH CLINIC AT HOME PILOT

SUMMARY REPORT

TO THE DETAILED FINAL REPORT BY SOUTHERN CROSS UNIVERSITY

SEPTEMBER 2014

