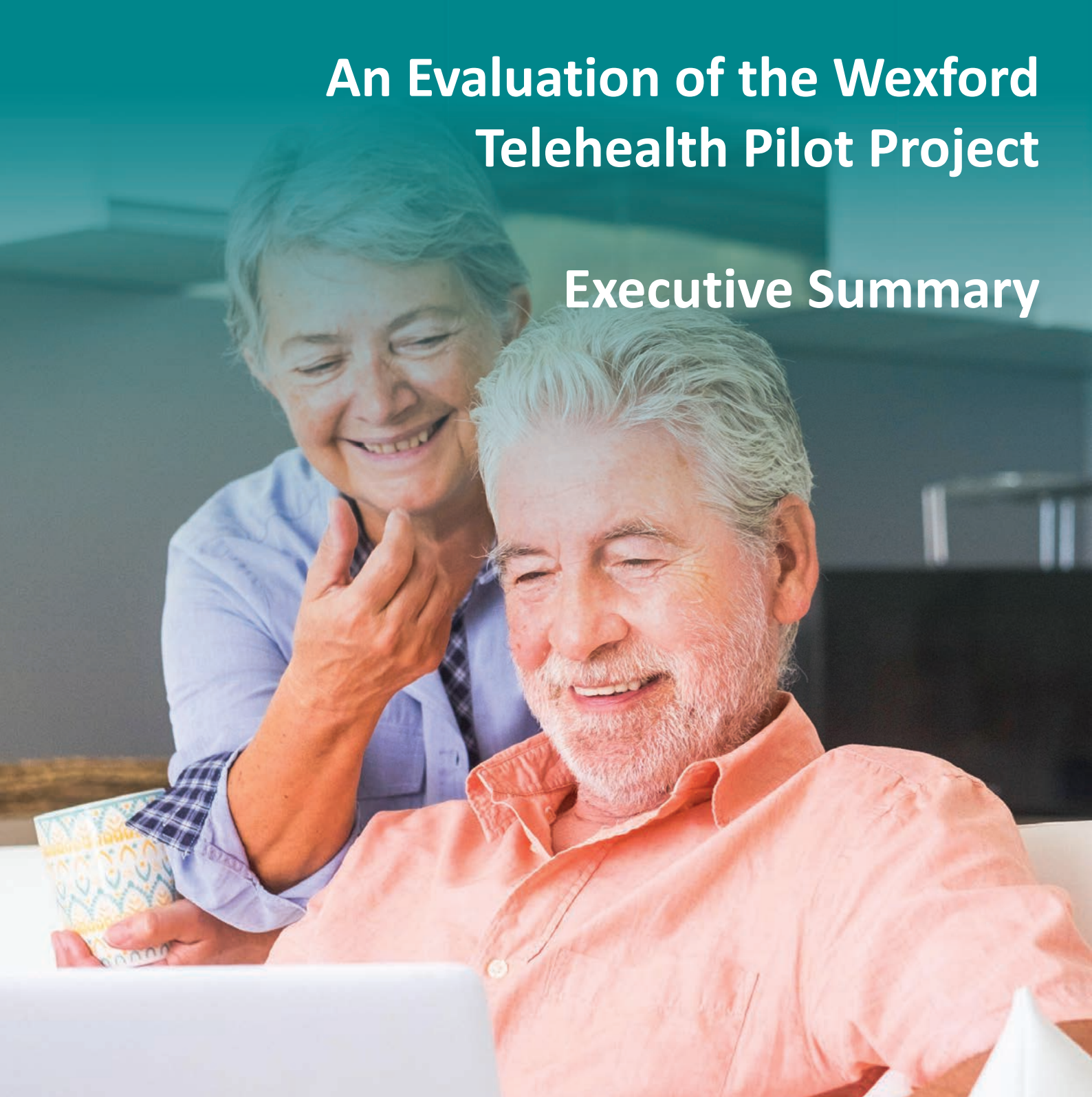


# An Evaluation of the Wexford Telehealth Pilot Project

## Executive Summary



Waterford Institute of Technology

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Oirthear na hÉireann



# An Evaluation of the Wexford Telehealth Pilot Project

## Executive Summary

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## Acknowledgements

### **Wexford County Council -Wexford Age Friendly Programme**

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## Background to the Pilot Study

The implication of an ageing population is marked with an increased prevalence of chronic diseases with such diseases being major causes of morbidity and mortality. In 2020, it was estimated that 1.3 million people in Ireland were living with one of the major chronic diseases: cardio-vascular disease, chronic obstructive pulmonary disease, asthma or diabetes. The impact of chronic diseases on health service utilisation is particularly evident in the acute hospital sector, with chronic diseases accounting for 40% of admissions and 75% of bed days (Department of Health 2016). The Department of Health and Children (2008) highlighted that 80% of general practitioners' visits were attributed to a chronic disease.

The call for the use of digital technologies in healthcare lies at the heart of national and international policies for future health provision and is in line with Slaintecare and the Integrated Care Programme for Chronic Disease Prevention and Management priorities. The Covid 19 pandemic has seen increased technology use in healthcare, born out of necessity. Telehealth refers to the use of electronic and telecommunication technologies to support healthcare at a distance from the patient. Telehealth can be used to support older adults to self manage their health conditions within their own homes, and international research has demonstrated the many benefits of such remote monitoring, including cost savings.

A telehealth pilot project was undertaken in County Wexford in 2021, overseen by a multi-agency Stakeholder Group (Age Friendly Ireland, Integrated Care Programme in the HSE; Wexford General Hospital (including Consultant Geriatrician and Clinical Nurse Specialists), Tunstall Emergency Response, Wexford County Council-Age Friendly Programme including the Wexford Older Peoples Council). The pilot project set out to provide a 12 week telehealth intervention to 50 patients with a chronic illness. The project was independently evaluated by Waterford Institute of Technology.

### Telehealth Project Objectives

The objectives of the pilot project were to establish a proof of concept for the provision of a telehealth service for three identified chronic conditions (Chronic Health Failure, Diabetes and Chronic Obstructive Pulmonary Disease) in County Wexford, with a potential to scale up nationally.

The research aimed to evaluate the pilot telehealth intervention, considering:

- the impacts of the intervention on the patient's clinical condition and wellbeing;
- in-person use of health services ascertaining patient and clinician perceptions of the intervention and technology and;
- an analysis of the cost effectiveness of the intervention.

The research design used a mixed methods approach, with a range of qualitative and quantitative data collection tools. Data was collected from patients using the telehealth technology. Patients were asked to take part in semi structured interviews at three stages during the 12 week intervention (prior to the intervention starting, during week 6 (mid-point) and within two weeks of completing the intervention). All patient interviews were conducted remotely via telephone due to Covid 19 public health measures in place at the time. Semi-structured interviews were also undertaken with referring clinicians.

### Telehealth Equipment

Tunstall telehealth equipment was provided to the patients for a 12 week duration. This duration was set due to Covid 19 limitations on the project and funding restrictions. The technologies used were the 'My Mobile' patient app and 'Clinical Triage Manager'.

The 'My Mobile' is a patient app which enables self-management and monitoring. The app collects data from monitoring devices on vital signals such as pulse, oxygen levels and blood pressure. It provides: automatically updated readings via Bluetooth-connected devices and the ability for manual entry of readings; automated alerts and activity reminders, as part of a health management plan; condition specific health questionnaires built into the system to capture clinical information; two-way messaging for interactive patient communication; and patient view of monitoring of results to enable better self-management.

'Clinical Triage Manager' is a clinical management software platform which enables clinical and service teams to monitor patients remotely. The system enables: remote monitoring of a patient by clinicians; automated prioritisation tools which helps triage urgent investigation; utilises a traffic light system to provide visual alerts to critical patient needs; contains Customisable Health Interview templates to create structured patient engagement; provides trend graphs for comparison of historic results and data-driven clinical decision-making; provides summary reports for clinical management, auditing and regulatory reporting; and can tailor monitoring plans according to the patient's lifestyle and condition.

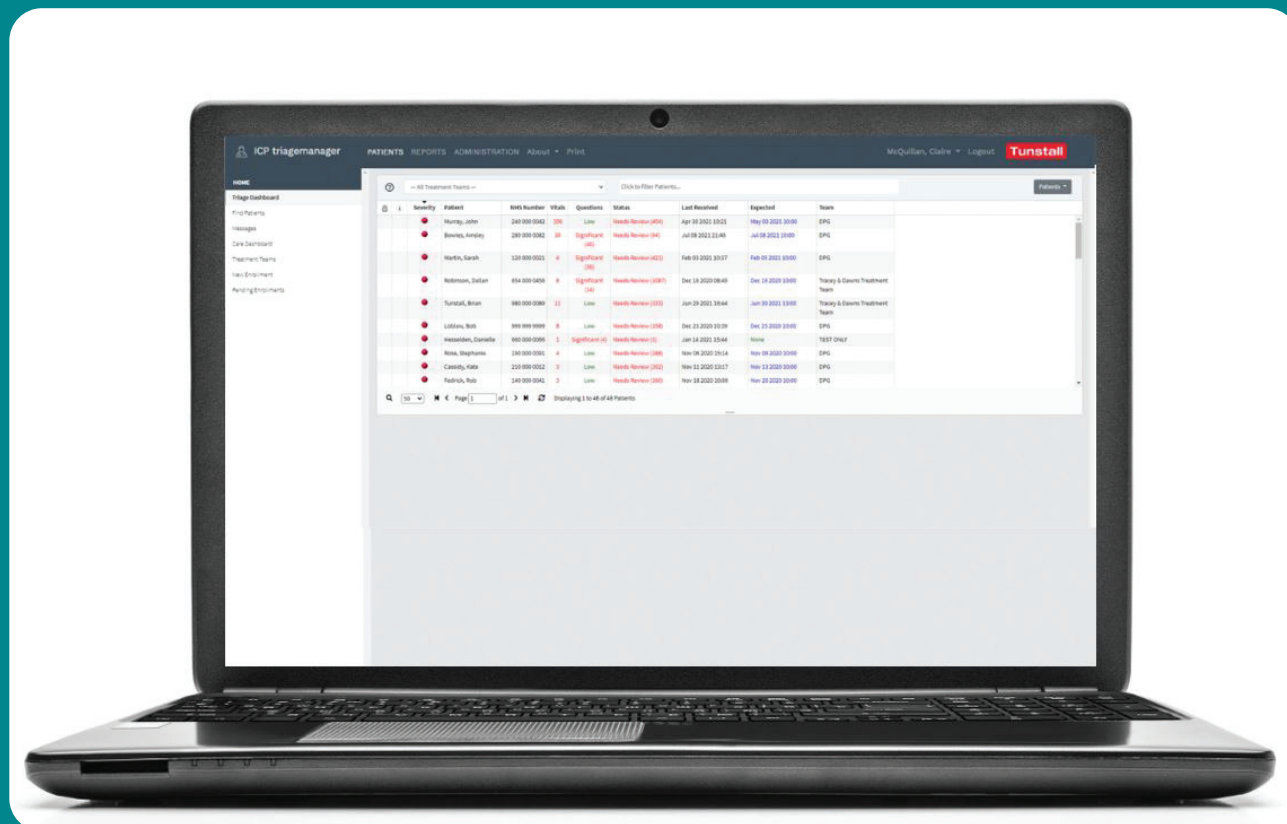
Depending on the clinical condition being monitored, patients were provided with specific equipment. The patients with COPD were asked to use a blood pressure monitor, pulse oximeter and thermometer. Those with CHF used the blood pressure monitor, pulse oximeter and scales, while the patients with diabetes recorded their blood pressure, weight and could also if they wished manually input their blood glucose readings. The patient readings and responses were transferred to participating clinicians, with a readings alarm system in place.



My Mobile Patient App



Clinical Triage Manager



## Summary of Findings

### Recruitment to the Intervention

A consultant medical doctor (Geriatrician) and two clinical nurse specialists agreed to recruit and monitor patients receiving the telehealth intervention.

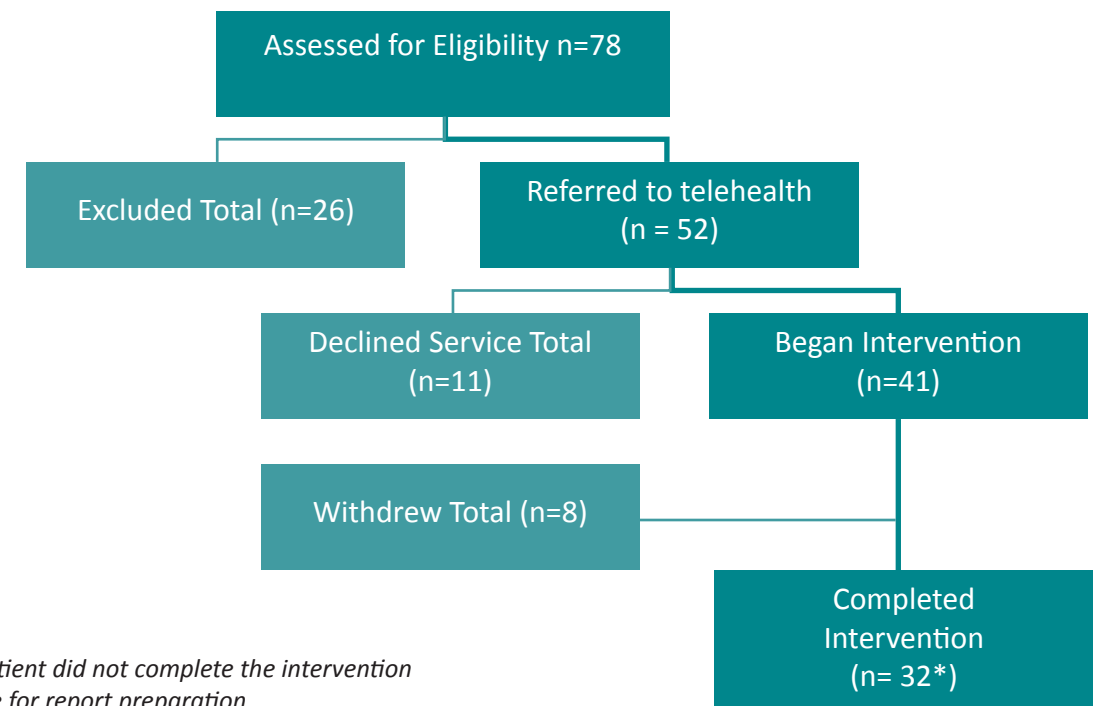
The patient inclusion criteria were:

1. patient diagnosed with one or more of the predefined conditions (with the clinician determining which was to be regarded as the primary disease condition);
2. ability to use or have support available to use the technology; mobile signal; literacy assessed by the referrer with a reading age 11 needed for intended use;
3. over the age of 55 years.

For the pilot study, clinicians went through their patient case list and contacted those who met the inclusion criteria. They excluded those who they knew were illiterate and had no support, had no English or who they considered would not be able to participate fully due to cognitive impairment, either dementia or intellectual disability.

Fifty-two patients were recruited to the intervention. However, nineteen did not take part or complete fully. Reasons for this non-participation included death of participants (RIP), change of mind, feeling too unwell or stressed, unable or no support to use technology. One patient was very delayed starting the intervention due to prolonged hospitalisation. See Figure 1 for recruitment flowchart.

Figure 1. Flow chart of Recruitment



\*one patient did not complete the intervention in time for report preparation.

## Sense of security

*'It's nice to know you are being kept an eye on so it gives confidence.'* [TWP19]

## Confidence in Illness management

*'I think because when I know my oxygen levels were good, it gave me more confidence to go through the day you know that this is good, my oxygen levels are good so I can do more.'* [TWP02]

## Use of Health Services

*'Well, I suppose I have been in the health service, and I think the change for users is that you can get a check from home without having to constantly go back and forth to the hospital.'* [TWP43]

*'It's not easy to be getting in and out of hospital for the most part and these things would help lower the footfall in hospitals and in doctor surgeries.'* [TWP43]

## View of the technology

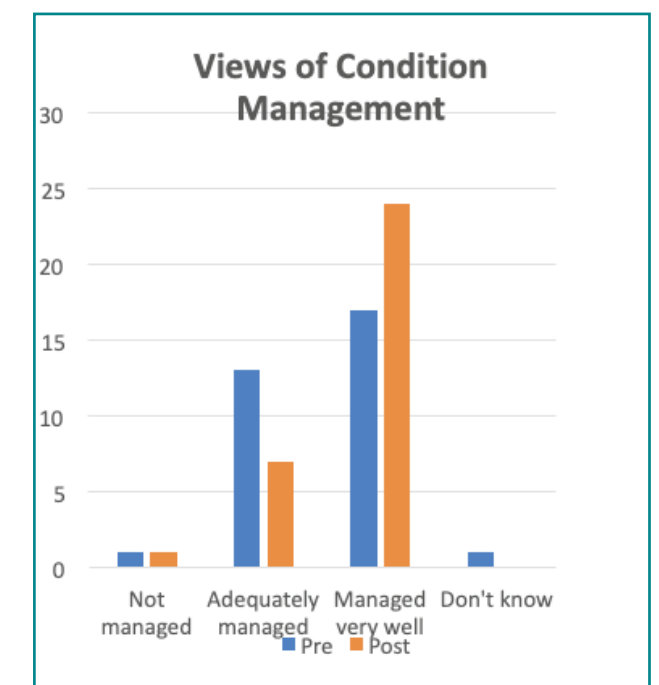
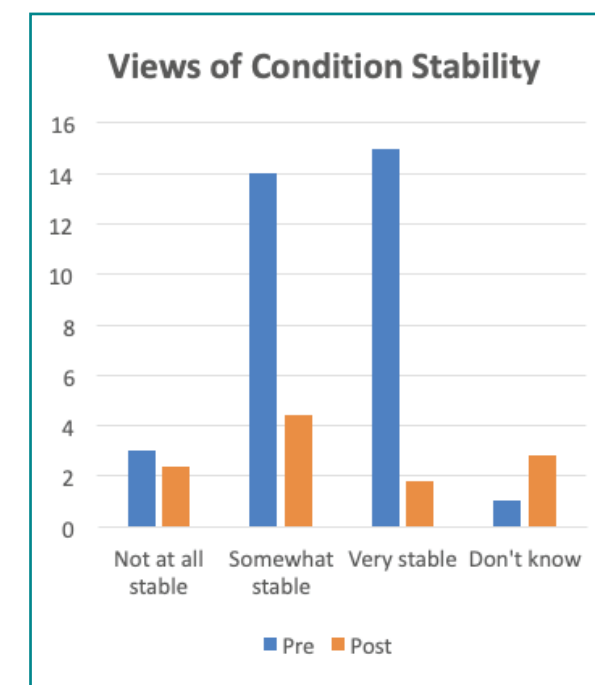
*'I'm very happy to use the Tunstall device, I'm very capable to use it.'* [TWP16]

### Participant Characteristics

Thirty-two participants completed the 12 week intervention. Most of those participating were male (85%), and married (57%), with ages ranging from 51 to 96 years (mean 71 years) and only 18% had private health insurance. The majority owned their own home (79%) and almost a third lived alone (30%). Over 70% had lived in their current house for over 5 years and only 2 participants (6%) were considering moving house. Over 80% had more than one medical diagnosis.

Participants were asked to rate their illness stability and management prior to, during and on completion of the intervention. Most participants (n=28) viewed their illness as either very or somewhat stable at all time points and the number of those who felt they managed their illness very well increased from time point 1 to time point 3 (52%-to 73%).

Regarding health service utilisation, only 6% had not attended a general practitioner (GP) within the 6 months prior to the intervention, with almost 50% attending 1-2 times. Other health services used included hospital clinics, where again almost 50% had attended on 1-2 occasions within the 6 month timeframe. Just over a quarter had been admitted to hospital in the six months prior to the intervention, with a mean duration of stay being 6.5 days (standard deviation 10 days). During the 12 week intervention, again over 50% attended the GP 1-2 times while two patients were admitted to hospital, mean duration of stay 2 days. Participants highlighted however how Covid had impacted on their use of health services, and that cocooning had, for many of them, resulted in less 'flare-ups' from their diagnosed condition in previous times.





Pulse Oximeter

### *Participants' Use of Telehealth Devices*

**Patient engagement with the device was very high** - only 2.6% of daily readings were missed. There was, however, follow up of participants by Tunstall staff when a reading was not recorded, which probably accounts for the very high percentage of readings inputted.

Looking at the readings submitted, and alerts raised, **all patients raised at least one daily alert**. With this monitoring system alerts could be raised from more than one of the readings, for example, there could be an alert for pulse and blood pressure on the same day. The number of alerts raised by individual patients ranged from 1 alert to 108 alerts. The number of days where alerts were raised by individual patients ranged from 1 day to 59 days, out of total of 60 days. The condition specific health interview was completed each day by patients. Many patients (19, 57%) noted no symptom changes in the health interviews over the 12 weeks.

### *Participants' Views of Technology*

Pre-intervention, over half the participants were happy to use technology, and almost all, nearly 90% rated their ability to use technology as good or very good. Almost 30% felt they would still need support to use technology. Seventeen of the participants used a computer regularly and almost three quarters (70%) used a smartphone. Reasons for technology use varied, and mainly related to communication and social purposes. For those reporting limited engagement with technology, there appeared a level of discomfort. Reasons for this included lack of interest and a perception of low personal capability.

At time 2, participants were asked regarding their use of technology and if their opinion of technology had changed. It seemed using the Tunstall devices had changed the opinion and improved the use of technology for some (almost 40%) but not all participants. The key changes reported included increasing confidence when using technology and using more technology. **Almost all (97%) were very happy to use the device and the majority (over 80%) found that the technology provided help in managing their illness.**

At time 3, post the intervention, again almost all participants (97%) reported that they would still be happy to use the devices and almost 80% reported that they had found the devices very helpful in managing their illness. When asked about problems using the device that they had experienced, these included when the measurement devices (weighing scales/ blood pressure and thermometer) did not work, but the main issue seemed to be connectivity. However, all the participants said that the support from Tunstall was very good to resolve the problems promptly.

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### *Participants' perceptions of the Telehealth Intervention*

Overall, **participants expressed positive views of the intervention** during the interviews at the mid-point and post completion interviews. Many participants perceived the telehealth intervention to have a positive impact on monitoring and managing their chronic disease and improving self-confidence in this regard. A limited number of participants did not perceive the telehealth technology as having an impact on their condition. For many participants, the fact that their condition was being monitored daily was reassuring and gave them a sense of security. This sense of security originated in the participants' belief that should their condition deteriorate, that some type of medical intervention would occur. It also seemed that the daily health-related readings helped some participants become more aware and take control of their conditions. For some, seeing that their condition was stable provoked a sense of confidence regarding their health and ability to manage their illness.

The majority of participants expressed that telehealth was an acceptable way of receiving health care. Perceived positive outcomes include **a reduction in unnecessary appointments, time spent in waiting rooms and time spent travelling**. It seemed some participants were fearful of in-person health care due to the risk of infection and the reassurance provided by the device reduced the need for contacting health care professionals unnecessarily.

The participants' perceived **the training provided to use the telehealth intervention as thorough**. However, it seemed that the training provided to the patients did not cover all the capabilities of the device. One of the main criticisms expressed was that feedback on the reading inputted, either from the device or health professional was not received back to the patients.

### *Clinicians' Views of Intervention*

Prior to taking part in the pilot study all clinicians were in favour of telehealth, were aware of how it could be used and thus were interested in taking part. As they had been asked to recruit patients and to do so in as timely fashion as possible, the clinicians' **rationale for including patients in the pilot study was based purely on the inclusion criteria** and not on other criteria which they felt could have been useful.

The issue of which clinical teams and which patient groups would benefit most from the intervention was discussed in depth. It seemed that the shared view held was that such a service would **fit well with the acute hospital condition specific clinical teams**. All three clinicians suggested that there needed to be more flexibility regarding duration of intervention and the need to tailor the intervention to the patient need. It was felt by all that the **telehealth intervention needed to be integrated within a self care management plan** for the patient.

All clinicians involved felt the telemonitoring technology used in the pilot study worked well, both the triage manager system and the monitoring devices / system provided to the patients. The referral system to Telehealth intervention generally worked well. The alert system worked well, however, checking for individual alerts was time consuming as the number of patients involved increased. Hence, the clinicians agreed with Tunstall that Tunstall would send a daily email to the clinician notifying of the alerts raised that day and the clinician then checked the system and followed up with the patients concerned if needed. One clinician said they got a lot of notifications of alerts, and did not necessarily follow up with the patient on all alerts but instead watched to see trends and then intervened as necessary. A view expressed by the clinicians was that the full capability of the technology was not utilised in this pilot study. The issue was also raised that during the cyber attack on HSE systems they were unable to access the system to monitor alerts for a time and also did not monitor when on leave from work.

As viewed by the clinicians, the ability of the participants to use the technology varied. It seemed, based on the feedback the patients gave to the clinicians regarding the technology, that they found the technology worked well.

The clinicians expressed that all patients stated that they liked being remote monitored. One clinician said some patients however became more anxious about the readings and sought more clinical appointments than normal.

Two external factors which the clinicians perceived as impacting on the intervention were the Covid 19 pandemic and the HSE cyber-attack. The pandemic slowed recruitment and the cyber attack caused challenges accessing the clinical triage system.

### **Conclusion**

The extent to which the pilot project objectives were met are as follows:

*To assess the impact of the remote patient monitoring service intervention on disease management, health and wellbeing.*

Participants engaged very well with the monitoring system with very low rates of missing daily readings. The findings indicated a high level of medication adherence, with 96% of patients recording that they had taken all medication as prescribed. The monitoring system generated alerts, mainly arising from readings from devices rather than the symptoms reported in the health interviews. Alerts are based on the vital sign parameters determined by the responsible clinician. Default parameters were agreed and set at pilot implementation with a view that these would be tailored appropriately,





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by the clinicians, for each individual patient. Had this be done the alert rate may have been reduced and been more appropriate. In some instances, when alerts were followed up with clinicians bringing patients back for review, there were no issues identified. However, in two cases, quite significant issues were identified and could then be managed.

The participants' chronic conditions affected their overall functioning and quality of life, with most participants having more than one condition. Their conditions, combined with living through Covid-19, meant some participants expressed distress about their illnesses and its impact on their lives. The majority of participants perceived that the intervention **helped them manage their condition by giving them reassurance that there was clinical oversight and confidence in their ability to manage**. For some participants, the **intervention gave them confidence to exercise more and a feeling that they could manage their illness more effectively** and were able to identify when they needed to take health related actions.

The participant results for mental wellbeing showed no evident changes in wellbeing scores between the three time points. Few of the participants met the cut-off for 'high' mental wellbeing, and this finding was reflected in the interviews where participants spoke of the impact of their illness on their mental and physical health and the impact of living during the pandemic.

*To explore the patients' experiences and views of using the remote patient monitoring service intervention on their health service utilisation and housing.*

The extent to which the intervention impacted on health service utilisation could not be determined. The six month period prior to the intervention and the 12 weeks of the intervention were during the pandemic when the patients were cocooning for most of this time and where normal health service utilisation, for example, attendance at clinics as usual was affected. Most patients commented, however, **that they felt less need to consult a doctor/ nurse as they knew they were being monitored**.

When asked about their housing, few of the participants had considered moving and most owned their own home but almost one third lived alone. The extent to which telehealth could assist them to remain living in their own homes was not evident to the participants, although some participants expressed a fear of their condition deteriorating and how they would manage.

*To explore the clinicians' views of the intervention and the impacts of the intervention including the selection of patients.*

The pilot study set out to recruit 50 patients. While 52 patients were referred for the intervention by clinicians, only 32 patients completed the 12 weeks of intervention. The reasons for patients declining

to take part having been recruited or withdrawing from intervention were varied, but included, in many instances, a fear or a reluctance to use technology. This was not the case for those who completed the intervention, who in the main, were happy to use technology.

Overall, the **clinicians were supportive of telehealth** and were of the view that the patients had been positive regarding the intervention. However, they were of the view that for future telehealth projects, **there must be very clear criteria on which clinical teams and health professions would get best use from accessing the intervention, which patient groups would benefit from the intervention, flexibility in determining the duration of the intervention depending on patient needs and preparation of the clinicians to use the intervention to its full capability.**

It should be acknowledged that, as this was a pilot study during the Covid 19 pandemic, there were some limitations, for example the training of patients was limited as the Tunstall technicians installing the devices could not spend time with the patients. Likewise, the pressure on clinicians during the pandemic meant that the full capabilities of the monitoring system were not utilised to full effect. Readings coming in not being monitored for a time due the HSE cyber attack and not being monitored when the clinician was on leave were also identified as issues by the clinicians.

*To conduct a financial evaluation of the intervention in terms of costs and savings;*

This considered the cost to deliver the telehealth intervention including both the Tunstall and clinician costs. The costing was based on 34 patients. This was calculated on those who completed the 12 weeks intervention and also takes into account the usage of the intervention by those who commenced but did not complete the 12 weeks.

Tunstall costs include installation (€100 per patient), maintenance (€5.77 per patient/ week), triage (€85 per day) and equipment (€1250 per patient).

Clinician costs included recruitment time and daily checks of system for alert, and clinical follow up identified by clinical judgement from alert readings. Clinician estimation of time for recruitment was 1.5 hours per patient (€35 per hour). Time was also required on a daily basis and this time was used for checking the Clinical Triage Manager system and follow up phone calls with patients. The costs for this time have been based on the Clinical Nurse Specialist pay scale- midpoint. The cost of review in hospital clinics was included as €172 per visit.

The estimated cost for an individual patient taking part in this pilot telehealth intervention was therefore **€ 2,155.**

## Recommendations from Pilot Study

The findings from the evaluation of the Telehealth Pilot Project for Chronic Disease Management have informed a number of recommendations. The recommendations for telehealth interventions in the management of chronic disease, are made in consideration of six quality domains: safe, timely, equitable, efficient, effective, patient centered care (Schwamm et al 2017).

### Recommendation 1

Telehealth needs to be integrated with telecare to offer a comprehensive solution which addresses patients' specific needs and enables both a reactive and proactive approach to management of their health and overall wellbeing. Telehealth can provide a safety net for persons with specific chronic conditions through frequent monitoring. Monitoring of chronic condition physiological parameters should result in the reduction of risk and potential harm through early identification and intervention.

### Recommendation 2

Alert systems exist to support the clinician in the provision of safe, efficient and timely interventions for patients whereby urgent issues are clearly identified and prioritised over non-urgent data. To utilise the technology to best effectiveness, clinical parameters set for alerts should be patient and condition specific. This use by clinicians would improve the telehealth system efficiency and safety as the alert system would enable the clinician to clearly identify urgent versus non-urgent clinical data.

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### Recommendation 3

Telehealth provision should be patient centered. The telehealth system used is fully flexible and can be tailored to individual patient needs. This evaluation demonstrated that patients have unique needs based on the combination and severity of their chronic conditions and co-morbidities. The telehealth service should reflect this, providing patient specific interventions and short or longer term monitoring based on patient needs and values.

### Recommendation 4

Patient training and support with technology use should be considered carefully from implementation through follow up, dependent on patient need. Consideration should be given to supports, such as peer support schemes, which may encourage hesitant patients to consider taking part. Patient training to use the devices should be easier to achieve in a non COVID environment where more time could be spent with the patients by the technicians installing the devices on the technology use, capabilities and requirements.

### Recommendation 5

Adequate preparation and training of clinicians in telehealth provision is of paramount importance in implementing new ways of working, within an integrated care system, in a safe, effective and efficient manner. Clinician training and support in the pilot study was impacted by the COVID-19 restrictions. Early clinician engagement to help design and shape the telehealth service is recommended. Clinicians working with telehealth within the integrated system of care should have the knowledge, skills and competence to utilise the telehealth technology to its' full effectiveness. Clinical nurse specialists would be ideally placed for the provision of telehealth interventions as part of an integrated specialist service. Consideration must also be given to ensuring that there is always a clinician overseeing the readings being received from patients.

### Recommendation 6

The findings indicate that the goal of improving patient self-management could not be fully realised due to limited feedback from the devices to patients and that the intervention was not incorporated into an individualised self care management plan. The telehealth system has the capability to provide patients with instant feedback regarding their condition but this feature was not utilised as part of the pilot. Effectiveness of the telehealth intervention in promoting patient self-management could be improved through the provision of timely, actionable, clear and concise feedback to the patients from the device.

### Recommendation 7

Telehealth provision for monitoring and managing chronic disease should be planned and implemented to meet specific patient needs within target groups. Goals include improvement of disease self-management skills through patient specific education; monitoring of chronic condition parameters to identify early deterioration; provision of timely and appropriate interventions to reduce risk and limit hospital admissions. Patient groups may include: patients newly diagnosed with a chronic disease; patients with an unstable chronic disease prone to multiple hospital admissions and recently discharged patients following admission of acute illness relative to their chronic disease.

### Recommendation 8

Based on the above, a key recommendation is to move to Phase 2 to roll out a broader trial with a wider number of patients across CHO Area 5 with a key focus on health and wellbeing and clinical outcomes. The Covid 19 pandemic presented limitations and impacted on Phase 1. Therefore, in order to produce more robust outcomes and measures, it is clear that Phase 2 will enable this further evidence.

## Appendix 1 Stakeholder Group Membership

Alice Corbett, Age Friendly Regional Programme Manager

Barbara-Anne Murphy, WCC Local Representative

Catherine McGuigan, Age Friendly Ireland

Cara Murphy, Clinical Nurse Specialist Cardiovascular

Dawn Watson, Emergency Response

Helena Fortune, Emergency Response

James Doyle, Emergency Response

Kate O'Connor, HSE South East Community Healthcare

Kevin Molloy, Wexford Older Peoples Council

Louise Edmonds, Age Friendly Regional Programme Manager

Niall Kennedy, Wexford General Hospital

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